

# Soil and Health Library

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**Part Four**

**WHERE DO WE STAND TO-DAY  
OUR TASKS FOR TOMORROW**

## Chapter I. WHERE DO WE STAND TO-DAY?

Again and again this question is raised: what is the present situation in agriculture? Book after book is written and in every book we find the same statement, that agriculture to-day is in a great danger. We need only look at one of the many magazines dealing with this subject. I have before my eyes a number of the well known "Farmers Weekly" Spring 1941. The front page bears the advertisement of a chemist advising the use of remedies:

Braxy and Blackleg Vaccine  
Marsan and Malagride for Blackhead of Turkeys  
Fowl Pox Vaccine  
Lamb Dysentery Vaccine  
Louping Ill Vaccine  
Swine Erysipelas Serum  
Lamb Dysentery Serum  
Pulpy Kidney Disease Serum

Then we open the magazine and find another advertisement:

Oxygas versus Mastitis

and the next page shows a remedy for:

Liver disease in poultry and Turkeys.

then a list of remedies for:

Lambing and Calving Troubles.

We proceed and find a full page showing beautiful ears of wheat, potatoes, mangolds, sugar beet, and kale-of course they all have been treated with fertilizers and we are told: "Every acre must be dressed for greater yields. We must have heavier crops from arable and grass to feed man and beast. Increased output is easy to get and it pays! Dress all your land with Sulphate of Ammonia". Another huge advertisement advises us to grow mangolds without potash. We have to broadcast 3-5 cwt. agricultural salt per acre, before sowing apply nitrogen and phosphate, and after singling to topdress with nitrogen. If we do all this, we are promised we shall get 4-8 tons roots per acre. Again a few pages later, there is an article about:

More Foot and Mouth Disease.

Pedigree Herd destroyed.

It is calculated that about 1,000 and 1,500 animals have had to be destroyed, including a pedigree herd of Hereford cattle at Brinsop Court, near Weobley.

You may take other magazines for farmers and gardeners and you will get the same impression: there must be many diseases in cattle, sheep, turkeys, swine, etc., according to the many remedies. Cattle must be destroyed that disease does not spread. We must increase our crops, and can do this with the help of mineral salts.

More and more the soil becomes mineralised, and more and more diseases are created, and more and more remedies are invented for these diseases.

## Hydroponics

Science goes on inventing new methods and so we have the next step: we abandon the soil completely, and begin to grow vegetables in water only.

This latest blessing of science comes from Dr. W. F. Gerike, of the agricultural Department of the University of California. Sometimes we find other names for this method: **Chemi-culture**, or **Aquaculture**. The fact that plants can be grown without soil is well known, but it was only applied for experimental purposes in laboratories. We are well acquainted with this method and have used it for many years in our own experiments connected with the study of "smallest entities". Now it is suggested that we should use this method in practical farming or gardening. In California Dr. Kolisko saw Tomatoes cultivated only in water, growing to an amazing height, so that the fruit had to be collected with the help of a ladder. Dr. Gerike got an average crop of 120 tons of tomatoes from 8,000 plants grown in **sawdust** and **water** on a third of an acre under glass. He also grows potatoes and flowers successfully. Harold J. Shepstone, F.R.G.S., mentions in his article "Gardening without Soil" \* that the requirements of plant growth are:

"Light, air, water, mineral salts and a support for the root processes. Soil is nature's expedient for providing the last three essentials (water, mineral salts and support for the roots) and it is by no means an ideal medium, subject as it is to such detriments as drought and flood and garden pests and weeds."

That is a very strange way to look upon the soil. In all the interesting explanations the main thing is never mentioned: **Life**. The soil means only: **mechanical support** for the root processes, and it provides water and mineral salts. If one has this conviction, then of course it is possible to introduce water culture. The advantage of this new method should be: "better health of the plants, quicker growth, a more consistent yield, less labour, lower growing costs and reduced space requirements".

"The seeds, cuttings or plants may be sown in sand, sawdust or cinders. If cinders are used, they should be first carefully washed out, so that all the fine material is removed. The nutrient solution should be given to the plants daily. Many methods for keeping the chemical solution continually percolating through the cinders have been devised and some experimenters have fixed up a vessel above the level of the pot so that the liquid drains through all the time. The liquid can be used repeatedly, so that, when it is drained off, it can be poured again over the cinders".

„For those who prefer waterculture, a tank and special trays are necessary. The tank may be of many materials, shapes and sizes, but if metal is used it should be painted to avoid chemical action. For tomatoes the tank should be about 4 inches deep, for potatoes 8 inches. The tank should have 4 trays resting on battens just above the water level. The floor of the trays should consist of wire netting covered with a thin layer of wood wool, which in turn is covered with sawdust. The seeds are sown in the sawdust, or young plants set in it. The sawdust is kept moist by the nutrient solution in the tank. The tank must be aerated either by using an aeration pump, or small tanks are sufficiently aerated by paddling the solution each day for a few minutes. If the nutrient solution is heated, quicker crops can be obtained".

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\* Mecano Magazine, July, 1940.

The nutrient mixtures can be bought ready for use. Harold Shepstone gives one general recipe which may be used with good results. To one gallon of water add one teaspoonful of saltpetre, one of Epsom salt, two of baking powder (free of alum) one to four of washing ammonia.

Is it not a pleasant idea? You need not have a garden, and yet you may grow your own vegetables, for instance on your roof garden in town! But do you really think that these plants produced with the help of saltpetre, Epsom salt, baking powder and ammonia will nourish you? What about the food value of these vegetables? Just let us think for a moment, that the tiny seed of a tomato for instance, representing concentrated life, is taken from nature, placed on a tray, and nourished according to our scientific principles with different salts: the roots are allowed to grow into the liquid instead of into mother earth and the plant will be supported mechanically. The seed is even so powerful that it really yields a well developed tomato. But what about the seeds produced by such an unnaturally grown tomato? The liquid mediates the forces of the moon, the light conveys the forces of the sun, the air is provided artificially by means of a pump, but all the other ingredients of a living soil, the manifoldness of life is missing. The earth is like a mirror receiving all the cosmic influences streaming in through the whole universe, and the plants reflect them in their growing processes. We up-root the plants, take them from their natural environments, and ask them to grow without soil. The seeds, if we look at them properly, are miraculous centres of life. **We have no power whatsoever to produce a seed artificially; the whole universe takes part in the production of the tiniest one. Man can only sow the seeds.** Why do we call the earth quite naturally "Mother Earth"? Because instinctively we have the feeling that the seeds are received from the earth as from a mother's womb, cared for by nature's forces. We have to care for the soil, to bring life into the soil, and the soil takes care of the seeds we put into it.

In laboratory experiments it is permissible to use liquids only for studying the influence of certain substances on certain plants. But even then we must always bear in mind that we do something unnatural, and must repeat the experiments in the open to see how nature reacts to our treatment.

Looking back on all our experiments and studies we can only come to the conclusion that aquaculture, introduced on a large scale is not to be recommended for growing food. It represents the climax of our endeavours to use artificial fertilizers, and in the long run it must produce unhealthy plants, lacking in food value.

We suggest making experiments raising some generations of tomatoes, potatoes, beans and peas, always using the seeds produced through aquaculture. We are sure that seed deterioration will set in. There would also be the possibility of studying the life-forces of different crops by means of our Capillary Dynamolysis (See Part II, Chapter VI).

### Our Daily Bread

Our daily bread no longer nourishes us. There is a difference between whole meal bread and ordinary white bread. This looks very appetising, it is perfectly white, and you can eat a whole loaf without feeling satisfied. The time is long past when one slice of farm bread was really enough for a hungry child! To-day we must even add a vitamin to the bread. We quote an article in the "Daily Express" July 20th, 1940:

"Looks like Sugar tastes like Acid-your war Loaf Vitamin.

Secrets of Vitamin B1, the new health safeguard which is to be added to Britain's war loaf, were revealed to me to-day by Prof. A. R. Todd, 6 ft. 3 ins. Scotsman, under whose leadership the vitamin was isolated.

With rice as his material, Professor Todd worked for nearly three years to find out how this nerve-building vitamin, found in vegetables, liver, and whole-meal bread, could be made synthetically.

The vitamin is now ready to be put into bread.

It is a white substance that looks like salt or soft sugar. I tasted some with the moistened end of my finger.

"That's enough for one person for a week," said Professor Todd. **You won't taste it.** It is chemically sharp and acid to the tongue. But the tiny quantity you will find in your bread will be odourless and tasteless".

"Enough to cover a sixpence would last you three months. An ounce properly apportioned would be enough for your whole life-giving you to the age of seventy-five.

Some vitamins taken to excess are poisonous. But not B1. The body will just take as much as it wants, then discard the rest.

The B group of vitamins was discovered during research into the causes of Beri-Beri, a disease found in Eastern Asia and other places where rice is the staple food.

It was found that the rice, robbed of its husk and then polished lacked something necessary for the nervous system. The germ of the rice, the tiny tip of the seed, contained the vital vitamin."

Reading this article we must ask **what has been taken from the wheat, that the bread needs the addition of a vitamin?**

Is it not strange, that we first rob the wheat of its nourishing qualities, and then must take a synthetic vitamin produced from rice to restore its vitality? Why has the bread lost its living quality?

We will take the answer to this question from another publication. In 1931 a book was published in Germany by Curt Leuzner\* "Poison in Our Food". It is a very valuable book, from which we quote the following passages:

### Flour

"The nutritive materials of corn: The centre of the corn consists of the meal-body, containing the starch grains in the cells. 68-67% of this meal body contains pure starch, pure flour, the rest is water, some fat, some albumen, some mineral salts and **no vitamins**. The meal body is therefore a quite good, but in itself dead nourishment. Exclusive use of it becomes fatal, due to the lack of vital substances.

The meal body is surrounded by 8 different layers of raw-fibres, the cellulose of the corn. The inner layer, the gluten or aleuron layer and the germ are the bearer of nearly all the vitamins. Furthermore here is stored the albumen and the fat. The germ contains about 41% of the total albumen of the corn. In the other layers we find phosphoric compounds (40-50%) potassium, sodium, calcium (6%), silica, chlorine, iron and much magnesium.

The milling process: Knowing the above mentioned facts, one would think that people would take special care of these most nutritive parts of their daily nourishment. Nevertheless, we find

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\* Curt Leuzner: Gift in der Nahrung (Poison in the Food), Leipzig, Verlag der Dyk'schen Buchhandlung 19311.

that these valuable layers and the germ which represent the motor of the corn and are the life bearers for its consumer, are isolated in the mills from the meal body, to be used as feeding stuff for animals. How is such a fundamental mistake possible in our century which is so clever? Why does the intellectually, highly cultivated, modern man carelessly cast aside the most precious thing Mother Earth and the Sun forces have built up for him? Why does he commit suicide? Business interests: the main reason is the great advantage the mills get in selling the mill by-products as feeding stuffs. That advantage is so great, that the finest flour can be sold more cheaply than the whole-meal. The isolation of these vital substances is justified because the fibrous substances are difficult to digest and because the fat content makes it impossible to store flour for a long time.

Wheat is the most milled-out product. Everybody likes to eat white bread, white pastry, macaroni, etc. The exclusive use of this natural product that has been milled to death, is a great danger to human health. We realise this in noting some involuntary experiments with nourishment. During the construction of the Madeira-Mamore railway in Brazil 4,000 labourers died because their one sided nourishment was lacking in vitamins and produced acidity: white bread and Harque-fried meat.

During the war the battle cruiser "Kronprinz Wilhelm" had to enter an American Harbour because the food they got in capturing ships, fine white bread, biscuits, cakes, coffee, and tinned vegetables made the crew sick.

The German prisoners of war in Russia, working on the construction of the Murman Railway, suffered the same fate. Their food was lacking in Vitamin C and many died from Scurvy.

It is not unlikely that, owing to the enormous amount of white bread consumed – even taking into account the apparent variation in our daily food, typical deficiency diseases will arise, especially scurvy. All this is very well known, and the scientists are endeavouring feverishly to find something which may balance that lack of vitamins, some additional substance which will restore to the flour what has been taken from it. Such an addition has been found. It is called: "Eviunis" and is said to be a freed phosphorous-vitamin-complex of the green-plant. "The food industry is looking more and more to the production of "Eviunis" foods. To "eviunize" flour and pastries is very important, because the vitamin content of white flour and bread is very low, because the vitaminous parts of the corn fall into the bran". ("Der Zuckerbäcker" 34. Jahrg. 46/3). Here again we have something artificial. Instead of using the whole corn with all the layers containing the vitamins and mineral salts we add to the flour that has been milled to death, a mineral-vitamin-preparation, which is again produced artificially".

This book was written in 1931 in Germany and in 1941 the same problem is faced in England. The same mistakes are still going on, the same excuses are made. Why? – Business interests.

#### **Powdered Meat will save Shipping space**

This article was found in another daily paper on the 11th of July, 1941.

"May be produced by Australia.

Sydney. – A process for reducing beef to concentrated powder form has been demonstrated in Australia. This may be the answer to Britain's meat shortage should this war be protracted, declared Mr. J. B. Cramsie, former Chairman of the Australian Meat Council. He produced a tin of powdered meat manufactured more than 6 years previously, to illustrate the success of the experiment. The meat was in perfect condition.

“In this form” he stated, “meat could be shipped by ordinary freight steamer or flying boat. It does not need refrigeration and would take up a fraction of the space which its own food value in carcass meat would occupy”.

That is another threat to the health of mankind. Fresh meat is a living substance. What is powdered meat? It has been kept in a tin for 6 years. That is a marvellous experiment. But why was it possible to keep it intact for 6 years? Because there is no life in the powdered meat. The paper does not mention it, but perhaps some synthetic vitamin was added to the powdered meat after it had been killed.

A considerable scientific discovery: How straw can be transformed into cattle food. (“Picture Post” July 12th, 1941). This is also a very interesting article. We are told, “that three million gallons of milk are delivered on the national doorsteps every day. Two and a half million cows are employed to ‘manufacture’ it”. That the writer of the article uses the word “manufacture” is a sign that he considers the cow a machine and this impression becomes even stronger if we read the next sentence. “The raw material which the cows convert into milk is, in summer, fresh meadow grass in winter chiefly hay, roots (such as mangolds) and concentrated feeding stuffs such as cakes and meals”.

“In the summer months, fresh meadow grass is alone sufficient to keep a cow content, and to enable her to produce an average of 2 gallons of milk a day. In the winter months, roots and hay are sufficient to maintain a cow in health, but not sufficient to draw off any appreciable quantity of milk from her. To produce milk, at a time of year **when nature never intended the cow to give it**, the animal must have 3 ½ lbs of concentrates (or their equivalent) for every extra gallon of milk she gives.

If a cow can't have her cake, she can't deliver any milk. This winter there will be little or no cake (because cattle cake is an imported product and imports of the stuff have virtually ceased.) Unless the farmers can find a substitute, there will be no milk this winter...”

“To use our reserves of grass – in the form of hay, silage and dried grass – as economically as possible, scientists have been studying ways of making animal feed out of waste products. Now the research station at Jealot's Hill announced that it has perfected a simple way of converting straw into palatable feed. Hitherto, straw – with the exception of oat-straw – has been used only as litter because, in its natural form, cattle are unable to digest it. The scientists at Jealot's Hill have found out how to pre-digest straw, so that it becomes a palatable food. It is of such high food value that it can be used to replace all the roots, or part of the hay and corn in rations for milk production. Its advantage is that any farmer can make it. The news is still news to many farmers. By chopping straw, putting it in a weak solution of caustic soda, then washing it in running water, a soft and bright yellow pulp is produced which the cattle can eat and enjoy. How successful the new feed is depends to a large extent on how quickly the farmers adopt it”.

Again we must say, as a scientific experiment it is quite interesting – but how it will turn out in practical life is very questionable. We grow further and further away from nature in our agricultural measures. Of course people may support the opinion that during the war it is necessary to use extraordinary measures. But how much will it help, if we get milk from cows fed from straw treated with caustic soda so that it can be digested: that milk will not and cannot be equal to milk from cows properly fed.



We introduce more and more unnatural methods and we shall have to pay very dearly for them. Years ago it was tried in human medicine to let people have pre-digested food. The outcome of this experiment was, that the whole digestive system was weakened. Now we begin to give cows pre-digested food. How will the whole metabolic system of the cow react after a certain time? What new illness will appear? What new remedy for it will the scientists have to invent?

And will it not affect our children? Milk is used for feeding children mainly, and if they do not get a really healthy product from a healthy cow, their digestive system will react. Of course science can go on and on inventing new artificial feeding stuffs, new artificial fertilizers, new remedies for animal diseases and plant pests-but mankind will have to pay an immense bill for this short-sightedness.

Having glanced through a few of the daily papers and magazines, we may as well have a glimpse in the shop windows. The druggist stores, the shops which sell agricultural implements and seeds, or plants, also sell fertilizers. Huge posters already catch our eyes from a distance: "Feed your crop with fertilizers!" Each year we need new fertilizers as well as old ones. You may get them in packages for 3d. or 6d. or 1s. or more: special fertilizers for flowers and vegetables, fertilizers which promise you results within "one week", others promise you the result in "10 days", some say that they are "even more than a fertilizer", others say they have a "living fertilizer". There is a special fertilizer for carrots, another for potatoes, and another for tomatoes. Side by side with these attractive fertilizer packages you have packages containing remedies for "Potato Disease", "Tomato Disease", dry sprays and liquid sprays, Bordeaux powder for celery leaf spot, Apple and Pear Scab, brown rot of fruit, peach leaf curl, cherry leaf scorch, rose rust, all fungus diseases: or preparations of Sulphur for mildews, white rust of spring cabbage, lettuce and tomato mildew for treating potatoes when storing and planting: it is also good for use against the red spider, the onion fly, the carrot fly and turnip fly. Then you get tins or packages of "Weed killers", "Slug Killers" and so on. There are as many fertilizers and as many diseases with the special remedies as there are plants. Watch people standing before these windows or in the shops-how confused they are! Everyone wants to do the best for his little garden or allotment and it is very difficult to find the way through all these advertisements. Yes it really seems to be a big business. Perhaps the business which is done with fertilizers and sprays and remedies, is even bigger than the one which is done with the agricultural output! I would not wonder.

Now let us study some recent publications. There is an interesting book about "**British Agriculture**". The Principles of Future Policy. "It is a report of an enquiry organised by Viscount Astor and B. Seebohm Rowntree". We have the "Penguin"-Edition 1939 and quote the following passage from the preface:

"Some have criticised us for not having dealt adequately in our earlier volume with what is called Bio-Dynamic Farming and the Indore Process or the importance of humus or organic manure. We have accordingly made a point of consulting some of the most representative and independent authorities on the subject. The claims by supporters of this school briefly appear to be, firstly that an essential condition for obtaining the best quality in food, is the treatment of the soil with organic manure, whilst the lack of such organic manure impoverishes the soil to such an extent that animals and human beings eating food grown on it suffer in health and physique: secondly that disease is increasing among human beings and that this increase is due to the larger use of artificial fertilizers, or to the irregular application, or to the non-application,

of humus: and thirdly that the consumption of grain and legumes grown on soil treated with organic manure (compost or humus) produces an improvement in health and physique which is measurable and augments resistance to infection.”

“Now, no one would deny the desirability of maintaining a proper organic content of the soil, and that humus certainly plays an important part in preserving this. But to admit this is far removed from accepting the statement, that human disease is increasing and that this is due to food having been grown in soil where artificial fertilizers have been used, or to food having been grown in soil where no natural manure had been applied”.

“The evidence to substantiate these claims seems inadequate and certainly all the vital statistics seem to indicate that disease among human beings, far from increasing is decreasing. There is no doubt that crops grown in soil very deficient in certain minerals will become deficient in these constituents, and animals fed exclusively on these crops will in their turn become deficient and may become ill if these constituents are lacking. This is for instance, true for aphosphorosis in horses, cattle, sheep and goats, a disease known all over the world in animals living on crops deficient in phosphorus”.

“Bad farming will obviously lead to a loss of fertility of the soil. But it has not yet been proved, that the use of “compost” necessarily denotes good farming or better quality food.”

“Compost adds plant food, e.g., lime, phosphorus, etc., and adds humus which helps to retain moisture. But any artificial means of supplying these nutrients in the form of inorganic substances might have the same effect upon plants as these nutrients supplied in the form of compost, and any kind of material which would help to retain moisture might have the same effect as the cellulose in the compost.”

“Experiments have been carried out in Rothamsted in which wheat was grown in three plots of ground which had organic manure, chemical manure, and no manure respectively. No difference in quality of the grain could be noted, though this does not necessarily mean, that the results would be the same if the experiments were carried out for a longer period.”

“While, of course, there is much still unknown, there seems to be no evidence of any mysterious substances or quality in compost or humus which would affect the health value of plants other than nutrients which could be applied by the ordinary commercial fertilizers.”

“It is to be hoped that some scientific body will study and report on the whole question of the use of humus and that, if necessary, further experiments will be carried out. Otherwise the case for a sound nutrition policy based on a balanced dietary, which includes a sufficient quantity of the protective foods, gets confused in the public mind with the question as to whether the quality of both protective and energy foods can be, and is being, seriously affected by the conditions under which they are grown to-day in most countries, including Great Britain.”

Bio-Dynamic Farming means: Farming according to the suggestions of **Rudolf Steiner**. We do not find the name “Bio-Dynamic” a very good one, therefore it has not been used in this book. So many movements and remedies exist which have similar sounding names, that we have preferred to call the method quite simply by the name of its founder, Rudolf Steiner. We sincerely hope, that the ample scientific material we have given in Chapter XIII “Artificial Fertilizer”; Chapter XIV “Experiments with animals to study the influence of smallest entities”; Chapter XV “Nutrition”; Chapter XVI “Vitamins”; Chapter XVIII “Capillary Dynamolysis: a new method to study the quality of animal excretions as a guide to their value as manure”, contained in Part

II: and Chapters I-VIII in Part III will satisfy the demands of Viscount Astor and B. Seeborn Rowntree. We do not employ any “mysterious substances” in the making of our compost heaps and we can prove definitely that such compost or manure heaps may be considered as life-centres, increasing the fertility of soil – and that there is no life in the ordinary commercial fertilizers.

There are other interesting facts in the preface of the above-mentioned book. For instance the authors refuse to be satisfied with the public expenditure of the present “meagre a £150,000 per annum on the partial investigation of animal diseases, when these cause to the nation an annual loss estimated at £ 19,000,000”.

In the chapter “Improvement and Management of Grass”, it is stated that many farmers still expect grass to grow by itself and do not see that a little money spent on fertilizers saves a bill for winter feeding-stuffs. Here we would like to point out, that especially for grass pastures, we will get the best results by using compost. We need not have animal manure for our pastures – nor should we use fertilizers. If we build up a heap of all kinds of garden refuse, fallen leaves, lawn mowings etc., in layers, alternatively sprinkled with quicklime, we must make sure that this heap does not smell. This would indicate that some of the nitrogen is escaping. We can avoid this by covering the heap with a thin layer of peat-moss. When the heap is sufficiently big, we insert the preparations (see detailed explanations in Part III, Chapter IX). If we use such a compost for the pastures, cattle and sheep will like to eat the grass, and furthermore, we get a most excellent hay which retains the food value. It would really mean an improvement in the value of grasslands.

In the Chapter X about fruit growing, we are told that the most baffling problem in fruit growing is the control of diseases and pests. Disease is more serious than it was 30 years ago, and the only effective ways of combating these plagues are the production of healthy stock and spraying.

Chapter XIV mentions the problem of the poultry farmer, and how to minimize the rate of depreciation of his stock. Probably about 50% of the laying flocks are withdrawn every year. That gives a total life to the bird of 2 years or a laying life of 1½ years. On top of this, between 10 and 20 per cent. of the birds die of disease. The Poultry Technical Committee in 1938 took a grave view of this aspect. They found poultry stocks riddled with debility and disease all over the country. They quote an authoritative estimate that the losses among adult birds alone cost the industry £4,000,000 per annum (equal to one fifth of the gross output of eggs). One of the obvious needs of the industry is to reduce diseases.

Chapter XV deals with milk production and gives some very frank statements. For instance it is stated, that the problem of the length of the life of the cow has received too little attention from farmers and agricultural economists. “The length of active, **healthy** herd life of the British milk cow is far too short. From investigations made by dairy research institutes milk recording societies and calculations based on our annual agricultural returns, the average herd life (i.e., the period during which she is yielding milk) of the English cow is slightly shorter than that of the Scottish cow and probably three years shorter than the Irish cow. With a milking life of only four years, the ability of a herd to maintain itself is extremely doubtful”.

Then the authors raise the question: What are the causes of this early mortality among cattle in England? They find, that “there is no very conclusive answer, but it seems probable that the demand for high yielding cows and the intensive system of milk production practised in this country are contributory factors owing to the strain imposed on the cows’ constitution. Another

disadvantage of this practice is that maximum yield does not necessarily mean maximum profit as, after a certain output has been reached, a cow's yield will not increase proportionately to the extra food given to her. The ideal which has been laid before farmers and encouraged by agricultural shows, feeding-stuffs manufacturers, and rearing and, breeding societies – that of attaining the maximum yield per cow – is a false one, and it is therefore not surprising to find quite frequently the unorthodox farmer with “poor” stock, low yields, but still lower costs, making better profits, than the “superior” farmer with a high class stock and high yields. This is the experience of Wye Agricultural College, in their investigations in Kent. As long as the average yield throughout the Country was very low, the ideal of a high milk yield provided a good rough guide to the improvement of cattle. But there are signs that this ideal has served its turn and may now become an actual handicap to improvement. It is likely that the future of the British dairy industry lies in the direction of low costs and long lives rather than in high yields and fancy breeds.”

Then follow the investigations about **Disease** and we are told that the “wastage of dairy cows through disease (Tuberculosis, Abortion, Sterility, John's Disease, Mastitis, Foot and Mouth Disease) presents a very grave problem in the industry. This was revealed in striking fashion by special investigations made in Scotland (1929) Cambridge (1928-1930) Reading (1929) and six southern counties (1930) each investigation covering from 9,000 to 13,000 cows. The result showed that about 50% of all the cows were disposed of through some form of disease. Not more than 5% died of old age.”

“Two of the most serious diseases are tuberculosis and contagious abortion. The Public Health Committee of the L.C.C. reported in 1933 that 83% of the milk arriving in London in glass tanks contained tubercle bacilli. The Economic Advisory Councils Committee on Cattle Disease estimated that 40% of our cows would react to the Tuberculin Test. There are about 5,000 cases each year of people suffering from bovine tuberculosis and about 2,000 to 3,000 deaths. (Journal of the Ministry of Agriculture 1932). This aspect of the question is of the greatest immediate importance, both to public health, and as inflicting a loss to farmers. Contagious abortion though less in the public eye is equally important, whilst “mastitis” (a generic term given to udder affections) may cause even greater losses to farmers.

The reasons for the diseased condition of the British dairy herds are not altogether clear.

Government measures for cleaning up the dairy herd have up to the present been inadequate.

The policy of slaughtering (with compensation) may have lessened the sale of highly infected animals but it has done little to eradicate disease”.

Chapter XXII, Research, Education and Advice state that “Science and the Machine will gradually conquer the peasant, to his ultimate advantage and greatly to the advantage of the common man”. We are afraid that we cannot share this opinion. We appreciate all that science has done for mankind's evolution – but should it happen that “science conquers the peasant”, that means his natural instinct for the soil, his intimate knowledge of nature's own ways and should the machine become **the master instead of being the servant of man**, then it would happen that mankind would starve in the midst of plenty. We might have an enormous amount of each commodity – but worthless food that cannot nourish man or beast. This is our deepest conviction, so we must express it as strongly as ever we can.

Under the heading of "Agricultural Research in Britain" we learn that it took the British Farmer many decades to learn the value of artificial fertilizers: "but recently, partly owing to the low price of fertilizers, he has used them more liberally and the total consumption is now 35% higher than in 1913. But there is still the problem of efficiency of utilisation of fertilizers: effective use is made only of a small part of the fertilizer used: the remainder appears to be lost, entering neither into the soil nor the crops".

The breeding of cattle and animal nutrition is pointed out as another important line of research. The question of the causes and effects of malnutrition among animals is intimately associated with the quality of food stuffs: the food must come up to certain quality standards. But how can we expect to get that standard quality, if we bring more and more dead mineral fertilizer into the soil?

It is suggested that more and more machines – the tractor the gyrotiller, the combine harvester, the electric milking machine should be introduced in all branches of agriculture.

The chapter closes with the statement, that at the present time it is "plain that a great deal more work needs to be done on animal diseases. Among cattle alone the loss through disease costs farmers some £19,000,000 a year. Although this branch of research has been extended, far more will have to be spent in the investigation of disease and other problems connected with live stock. Practically the, whole of British Agriculture depends on our live-stock industry: until the animals are healthy, farming will not be healthy either."

Here we must say it is just the opposite way round: **Until farming is healthy the animals will not be healthy either.**

Another interesting publication is the Penguin Special "Science in War". The title page assures us, that "this book not only analyses the conditions which have lead to this dangerous state of affairs, but also shows where science could be applied with immediate benefit to our national effort. It has been written by 25 scientists, all of whom speak with authority in their own fields".

We are of course specially interested in the chapter dealing with the agricultural problem, that is Chapter V: Food. At the beginning we are told about the importance of the vitamins. We are told (page 68) that it is "useful, though dangerous, to draw an analogy between the body and another form of internal combustion engine-say, a motor car. The former is mainly built of water and protein: the latter mainly of metal. Both obtain energy from the combustion of fuel, petrol in the latter and foods (mainly carbohydrates and fats) in the case of the former. The body obviously relies largely on protein for growth and the replacement of wear and tear, just as the motor car needs mainly metal for its manufacture, we see that minute amounts of special metals are necessary for the manufacture of certain essential parts of the engine – for instance, the points of the magneto. In a similar way small amounts of vitamins and salts are necessary for specific functions of the body.

"Obviously the amount of foods required by a person depends on his size, his activity, and whether he is growing. The amount of petrol a motor car burns, depends upon its size and the work done by the engine: when the latter is only 'ticking over' it requires a little petrol, but much more is needed when it does work in moving the car. Similarly a resting soldier expends some energy, about 1,600 calories a day in keeping his body warm and his heart beating, but when he goes into battle he expends 4,000 calories. The amount of vitamins also depends upon the

size and activity of the person, and active adults, pregnant or nursing women, and children need considerably more than sedentary people.”

Then we are told (page 69) of the experiences made in the last war concerning food: the importance of fresh fruit, lemons, oranges, etc.: that vitamin shortage was the most important cause of the collapse of the home front in Germany in 1918. “The enemy no longer had any stomach for fight.”

(Page 70). “After the war knowledge of nutrition increased at an enormous rate. Science told us what we should eat and why we should eat it, and also made cheap synthetic vitamins available.”

(Page 72). “The food problem becomes of outstanding importance and the cost and supply of vitamins and salts is an urgent problem”. (Page 74). “Science has provided an emergency solution of this urgent problem. Nearly a dozen vitamins can now be manufactured artificially and it is possible to prepare some of them in large quantities and cheaply either by synthesis or by extracting them from rich sources that are not needed as foods. As an example of the former, a daily dose of pure vitamin B 1 made chemically to-day costs a halfpenny (and the price could be reduced to a tenth of this if private commercial interests were controlled), whereas 6 years ago the cost of the yeast alone from which a daily dose of the vitamin could have been extracted was 10s. In other words, an amount of this very important vitamin that could now be obtained for 1d. cost over six years ago. Other vitamins may be obtained more cheaply by extracting them from rich natural sources: the Russians are extracting vitamin C on a large scale from pine needles. The minimum daily requirements of each of the ten or so most important vitamins, together with a few important minerals (such as calcium, iron, a trace of copper) could easily be incorporated in a “biscuit” which would be distributed free or at a very low price to the whole population. The annual cost would be less than £42,000,000, and the saving in health and efficiency immeasurable. This figure of £42,000,000 should be contrasted with the vast sum (approximately £50,000,000) that is being spent in subsidising British Agriculture to an extent that is inadequate to provide these vitamins. If each person in this country who chose could get just sufficient of each of the most important vitamins by the simple expedient of eating a free biscuit daily, the chief part of the nutritional problem would be solved, both in time of peace and in time of war. This is only one of the gifts that nutritional science offers, and it is for the government to accept this gift.”

That is one of the solutions offered by this scientist concerning the food problem. Furthermore he suggests (page 75) that home produced foods could be increased enormously by providing sufficient power for efficient cultivation, by the control of pests, by the scientific use of fertilizers, by making silage and grass drying, by using by-products (e.g., for growing yeast) or waste products (e.g., sea weed and nettles for turning into forage, and sewage for feeding fish ponds); and by the full use of chemical methods of preparing foods artificially (e.g., the treatment of straw with caustic soda for forage and the artificial production of sugar). “From these facts the important conclusion breaks forth: science can make us a largely and perhaps entirely independent of imported food, and can also raise the health of the people from its level in peace time by providing proper nourishment. The government must mobilise science for this great triumph.”

“We must produce much more. And to do that it is necessary not only to increase the amount of the land under cultivation, but more particularly to increase the yield per acre.”

(Page 83). “During the first winter of war the only constructive effort to stimulate agricultural production was the ploughing-up campaign. The advice of scientific experts was neither sought nor encouraged. So far as agriculture was concerned, this was a non-scientific war.”

(Page 83). “What had scientific research in agriculture to offer, in view of its neglect in this country in the years preceding the war? Admittedly far less than it might. There is, however, a large amount of scientific knowledge which is available and is at present not being used. Thus, existing experimental results indicate quite conclusively that much of our agricultural land is grossly underfertilized. Moreover, experimental work has shown that on heavy soils the supposed virtues of farmyard manure are largely mythical, and that at any rate over a short term of years it can safely be replaced by artificial fertilizers. The maintenance of large heads of live-stock on such land merely to produce farmyard manure is certainly not necessary.”

Then the scientist speaks about the different plant diseases, animal pests, etc. He advises (page 91) “that the biological societies which ordinarily meet to discuss individual and diverse problems, could be turned to practical use. They should meet together and with farmers, under Government auspices, to discuss urgent economic problems, such as those of insect control and to make proposals for dealing with them. The eager response to any such request from those whose names are now buried in the Central Register of Scientists would at once show what these men could do to help the country.”

In the chapter “Meat at any price” (page 97) we are told, “that the ideal protein diet for a man would a priori seem to be meat from another man. As this is socially undesirable, the next best is to eat the flesh of another mammal such as an ox. Rather more ox must be eaten than appears necessary, in order to make sure that a man gets the correct sorts of amino-acids he needs from the rather unsuitable ox proteins. Still more meat from lower animals must be eaten to supply these needs, and still more of proteins from plants. In fact to get the right amino-acids from plants it would be necessary to balance a vegetable diet in a very complex way. High grade meats are therefore a very desirable part of our diet.” (Page 99). “The production of meat in a country depends upon the fertility or rate of growth of its farm animals. But these factors could be immensely increased by the application of knowledge that has been gained in the last twenty years about the physiology of reproduction and the process of growth. Every stage of reproduction and growth is under control of “hormones” which are specific chemical substances liberated into the blood by certain glands, and which control the development of other organs and tissues. In some cases they can be made synthetically and all of them can be extracted from parts of the animal body usually discarded in slaughter houses”.

“We already know how to apply our knowledge of “hormones” to the problem of meat production. The first is the acceleration of the rate of production of the eggs from which the next generation will be formed. This is of no immediate interest in poultry farming, since egg-production has already reached very high levels in the usual laying breeds. A field of immediate application, however, is sheep breeding. Most of our breeds of sheep produce lambs only once a year. Some have as few as 20% of twins, others as many as 80%. One breed – the Dorset Horn – lambs twice a year. These differences have developed, as we saw, under selection, and can be gradually overcome by selection. But for our immediate purposes the situation can be changed by direct treatment of the ewes to encourage twinning and to make them, if we want, breed twice a year (Medical Research Council Report 1938-1939. H. M. Stationery Office 1940). If an

increased crop of lambs could be dealt with such a crop could be obtained by artificially induced fertility.”

“So far as the growth of animals is concerned it is unfortunate that science cannot offer methods as certain as those which will accelerate their breeding. On the other hand, there is a mass of information about the hormonal factors which influence growth. The pituitary gland, the thyroid and the sex glands all play their part, and what is necessary now is to examine the many claims that have been made in this field and to determine what use can be made of the knowledge that is available.”

“The production of milk is also under hormonal control and in the last few years research has been going on at several centres including the Dairy Research Institute at Reading, on the possibility of increasing yields, or prolonging the period of lactation, by administering hormones. Favourable results have been claimed for extracts both of pituitary and thyroid, and Russian scientists claim to have been able to effect increases of 20% in milk yield in this way.”

“In every field of agriculture and husbandry, therefore we find that the application of scientific knowledge and scientific methods could immediately increase productivity.”

Our opinion is, that this quite unnatural way of forcing the animal body to produce more generations, to have twins and in such a way to produce 4 times as many as the natural conditions would allow would mean: **exhausting the animal body in the same way as the soil is exhausted by fertilizers.**

**Here science wants to use the “hormones”, there the “fertilizer” to increase “crops of plants” or “crops of animals”. The price will have to be paid for this misuse of nature – and it will be: loss of fertility of the soil, loss of fertility in animals. More diseases will arise, more abortions, less strength to withstand epidemics. The vitality of the animals will be more and more weakened. We will have bigger crops without food-value, we will have more animals, without health.**

Another Penguin Special is the book “Our Food Problem and its relation to our national defences” by F. le Gros Clark & R. M. Titmuss. In this book we are told in the chapter about “Home Farming and War”, that “the true danger is that of exhausting the fertility of the soil. Food is not produced on the land but in the land, since meat, milk, and eggs depend ultimately upon vegetable feeding-stuffs. The soil must therefore be kept in ‘good heart’. All who have studied the problem agree to-day that arable-grass farming is the only safe method; every few years the pastures should be ploughed up and seasons of grain and fodder crops follow before fresh grass strains are sown. Otherwise the pasture itself deteriorates and the farmer, depending more and more upon imported feeding-stuffs, uses his fields as a mere exercise ground for his stock.”

(Page 52. “The improvement of the soil is simply a matter of applied science. It has been estimated that at least 16,000,000 acres of grassland could be made to increase their fertility: by proper management of the grass, the stock-raising capacity of most pastures could be doubled. Even the rough hill grazing areas could be improved, at all events up to the height of 3,000 feet above sea level, by ridding the soil of existing vegetation, applying suitable fertilizers and sowing it with selected strains of grass and clover.”

(Page 53). “We have already remarked on the illusion that we are increasing our food production. We have become more and more dependent upon imported feeding stuffs. The cattle, pigs, and poultry are machines – and wasteful machines at that – for converting imported grain and oil seeds into meat, milk and eggs. It is true that we must have meat and eggs in our diet; but the



question is whether we should not save by importing them in time of war and saving our tonnage on feeding-stuffs.”

Another recent publication is Lord Northburn's book "Look to the Land" (1940). Lord Northburn is a landowner in Kent and Northumberland, and runs a large mixed farm and market gardens. He says in the first chapter, that: "Few people realise as yet that the agricultural problem is by its very nature every bit as much a townsman's problem as it is a farmer's problem and that there is far more in it than a question of cheap and abundant supplies of food. This book is an attempt by a layman, writing for laymen, to set forth how much more there is in it. It is an attempt at a biological and economic conception of the present situation. As such it must start from the soil."

He points out the danger of soil erosion, which is always going on, even on some soils which are in a good state of fertility, and refers to the large literature on the subject, especially to the well-known book "The Rape of the Earth" by Jacks and Whyte. No country is wholly exempt from this phenomenon, but the big continental areas are generally the most seriously affected. There is soil erosion in U.S.A.; in Africa, the Sahara Desert is moving at a mean rate of over half a mile a year, the Turkana Desert at six or seven miles a year. In China, in Russia, in Canada, everywhere the same tendencies are observable". "But serious erosion is only the culminating stage of a process of which the initial stage is usually loss of fertility of one kind or another. "Probably more soil has been lost since 1914 than in the whole previous history of the world."

Lord Northburn voices his opinion, that so far as the modern growth of deserts is concerned it is not nature, but man who is the desert-maker. "It is not unlikely that most of the great deserts of the world are of his making. When we consider how he sets about it now in conjunction with the fact that traces of high civilisations are found in many areas now desert, the probability of his past guilt becomes greater. And the exhaustion of the fertility of the soil is no new thing, nor is the temptation to practise it for the immediate gain. The new feature in the situation, is that man has recently enormously extended his physical powers by the use of mechanical devices. One man can now do what used to be the work of dozens or even hundreds, and can do it faster."

Having found out that farming is sick, Lord Northburn wants to look at man and domestic animals, to see if they are also sick. "If they too are sick there must be some suspicion of relationship between the two sicknesses: especially if the sickness of man and his animals is otherwise difficult to account for. But in considering man and animals we are up against a difficulty. It is this: how are sickness or health to be defined, or with what state, present or past, actual or hypothetical, is any present condition which may be found to be compared? Exact records of past states of health in any form which could be called scientific are not available, still less in conjunction with exact records of the biological environment accompanying them. In so far as we try to assess any improvement or deterioration of health over any considerable period, we can only rely on accumulated impressions. These may carry conviction, but do not constitute scientific proof. However, if we waited for scientific proof of every impression, before deciding to take any consequential action we might avoid a few mistakes, but we should also hardly ever decide to act at all. In practice, decisions about most things that really matter, have to be taken on impressions, or on intuition, otherwise they would be far too late. Even in the domain of science, where exact measurement is sacred, and exact evidence based on it is the aim (and a very good aim though a limited one), the important advances have been made through intuition, politely called genius,

and the scientific verification has come afterwards. That is to say, he is the genius who promulgates the hypothesis which proves to be the correct one.”

“We have to live our lives in practice, and can very rarely wait for scientific verification of our hypotheses. If we did, we should all soon be dead, for complete scientific verification is hardly ever possible. New facts come to light and alter conclusions. It is a regrettable fact that a demand for scientific proof is a weapon often used to delay the development of an idea for the sake of private and very often most unscientific likes and dislikes. We really act on what we believe that matters. Proof can reinforce or weaken belief, but false or incomplete proofs can be both plausible and misleading.”

“We in this country are certainly worried about our health: no denial of that is possible. And if it is said, that this worry is hysterical, it may be urged that hysteria is a sub-normal and therefore unhealthy state. We spend £275,000,000 a year on public health services alone and the demand for more expenditure in that direction is increasing.” (Compare this statement of Lord Northburn with the statement of Viscount Astor and Seebohm Rowntree, that “all the vital statistics seem to indicate that disease among human beings, far from increasing is decreasing.”)

“The cost of animal disease in 1937 was estimated to be 10% of the total return secured by farmers from their animals. Liability to disease shows itself increasingly among classes of livestock bred for high production, especially poultry and dairy cows. The mortality in egg-laying trials rose from 6 to 10% in 1929 from 10 to 22% in 1934 in spite of the fact that the greatest care and skill are lavished on the birds concerned.”

“Dairy farming is becoming even more trying as a business owing to mastitis, tuberculosis, and breeding difficulties. Yet never before were the animals so “scientifically” cared for. We slaughter many thousands of animals yearly owing to tuberculosis and foot and mouth disease. Yet our ancestors do not seem to have had to bother about tuberculosis in animals, and within living memory foot and mouth disease was a slight incident in the life of most farm animals, often even welcomed by farmers as it was followed by a marked improvement in condition. Certain diseases of sheep in some of the main north country breeding areas are beginning to turn what has been for generations a steady if not very lucrative business, into a highly precarious one. Instances like this could be multiplied.”

“In plants we find a similar state of affairs. All sorts of precautionary measures, unheard of previously, seem now-a-days to be necessary if satisfactory crops are to be grown. An enormous annual expenditure is involved in the multiple sprayings which are given to fruit, hops, potatoes, etc., in spite of which these crops are not infrequently overwhelmed or spoiled by disease. Such procedure was quite unknown to former generations, and seems to have been unnecessary. And it is quite certain that our ancestors often cultivated very intensively. It is equally certain, that there exist a few people who still cultivate intensively with little trouble from disease, without recourse to specific defensive measures against diseases and without artificial manures and without any loss of fertility of the soil.”

“Just as we demand for ourselves more and more treatment and more and more hygiene, so we do for our animals and plants. The advance made in the knowledge of the diseases of animals and plants within the last few decades is comparable with that made in human medicine and hygiene. The two cases are in all respects closely parallel. Is it likely that they are both not, in all their aspects, merely aspects of one over-riding phenomenon? “

Although we would like to quote more of this interesting book, we must limit ourselves in this direction. In his last chapter about the "Farmers' Responsibility" Lord Northburn states truthfully that "we habitually look at life in bits and pieces: we analyse and specialise in all departments and are completely bewildered by the complexity of the results. We try to tackle each bit separately; our doing so invariably produces a complication somewhere else. The Hydra grows two heads for each one we cut off."

"In undertaking farming we undertake a responsibility covering the whole life cycle. We can break it or keep it whole. We have broken it, but there is yet time to mend it: perhaps only just time."

"The nature of living things is that they are not mere machines. The fact that from one point of view they are machines has largely deceived us. But they are something more. That something more does not respond to mechanical or statistical treatment. It responds only to that for which we have no other word but love. We have tried to conquer nature by force and by intellect. It now remains for us to try the way of love."

"The **Labouring Earth.**" A Survey of Agricultural Conditions at Home and Abroad by C. Alma Baker, C.B.E., with an Introduction by Rt. Hon. Lord Addison.

Alma Baker is a well known personality. He owns big estates in Malaya and has written many books about agricultural problems like Rubber Planting, or "Facts relating to new scientific discoveries concerning Life-giving foods" (1923) or the "Rough Guide to New Zealand's big Game Fishing" (1937). But he was also keen on the development of aircraft and we find a publication with the title "Carry on" (the future service of aircraft). Addition to Battleplane Souvenir (1920). It will perhaps be remembered that a very short time ago the papers wrote about a generous gift from Alma Baker to give a "Spitfire" to the Empire every three months. This personality had an immense interest in agriculture and in the last years of his rich life he came into contact with Rudolf Steiner's methods as outlined in this book. Immediately he started to try these new methods on his estates in Malaya and whenever he came to England he never failed to visit English representatives of these new farming methods to get new information and to talk over his special farming problems. We had the pleasure of his personal acquaintance, when he visited the Biological Institute at that time in Bray near Maidenhead, and later on Dr. Kolisko was interviewed by Alma Baker concerning his special interest "sheep disease".

In 1938 he published a pamphlet "The Soil and its Products" with the dedication: "In the twilight of a long and full life, I dedicate to the Empire and to Mankind, this Memorandum "The Soil and its Products" – the impressions covering many years of personal experiments in soil problems in outlying parts of the Empire". In the preface of this pamphlet he tells us, that he has dealt with the land and its products for nearly half a century and has vainly tried throughout the years to discover, amongst the numerous manuring and fertilizing substances advocated from time to time, even one wholly satisfactory form or system that would enable disease-free plant and animal life to be produced, and maintained. "Unfortunately none of my former endeavours gave the desired results, but subsequently two rays of light illuminated some of the hitherto obscure causes of soil infertility, and also possibly, the incubator of our many diseases, ill-health, and ailments, continuously hampering the social, political and economical development of mankind".

“The two systems of agriculture that gave me hope of improving the health of soil, plant and animal, and man, came before the public a few years ago, in the methods of “Dynamic Agriculture” and the “Indore Process”.

“Both systems aim at a living soil, but in the Indore Process its originator makes no direct claim to enlist the vital interplay of the unseen influences and forces surrounding all life on earth: while the originator of “Dynamic Agriculture” definitely contends, that the conscious enlistment of such influences and forces by practical measures is absolutely essential for the healthy development of all living organisms”.

“The study and practice of the principles of the above two systems of agriculture have impelled me to write this memorandum. I therefore have appealed to all Governments to investigate the influences of manurial substances and systems upon fertility of the soil and the nutritional value of its products.”

“The World Press to-day is rife with complaints and enquiries regarding the reduced fertility of the land, and the lessening value of its products, and these, from an unbalanced soil are no longer immune from creating disease.”

“Our hospitals, Nursing Homes and Mental Institutions provide ample evidence of the daily increase of disease in human life.”

“Is the remedy for this dreadful state of affairs to be left to the working farmer whose time is fully occupied with the everlasting unsatisfactory efforts by trial and costly error to produce a paying crop to support himself, his family, and those he employs, with little or no knowledge of the health or disease-spreading qualities of the crops he harvests, or will the Government in whose hands are the care of the soil, and the health of its people, fully honour the great trust of which they are custodians?”

In the Appendix of this pamphlet Alma Baker speaks of Dr. Rudolf Steiner’s System of “Dynamic Agriculture” so that he emphasizes, that of the systems of agriculture he is acquainted with, he considers Rudolf Steiner’s method complies more with Nature’s requirements for the production of food adequate to human and animal needs than any other system now practised.

In this system the substances of the “Earth’s soils are combined with the cosmic influences, while the latter are apparently disregarded by other modern agricultural systems.”

“As far as I can judge, “Dynamic Agriculture” is the only comprehensive new system of farming developed in modern times which makes use of old and well-proved principles coupled with new, but obviously reasonable conceptions and theories regarding the ever-present and ever-working quota of natural life in the four Kingdoms of Nature, and thus carries the prolongation of natural plant life into the future.”

“Rudolf Steiner lifts the problem of manuring from the level of adjusting the substantial requirements of the plants, to the level of life, by defining manure as “making the soil alive”. In doing so, the farmer brings the soil into “good heart”, and therefore definite heart-like functions can be said to be promoted in the plant. Thus the plants are enabled to make use of all the beneficial forces and rhythms circulating in their environment. It is the duty of all farmers to establish the right equilibrium between earthly and cosmic substances and forces. In doing so he raises his farm to the level of an individuality.”

“At the present time I am following out the practices of this system of agri-culture on portions of my rubber estates in Malaya and on my sheep and cattle pastures, crops and orchards in New

Zealand and at the same time I am experimenting with other organic substances, in order to compare their effect upon soil conditions, plant growth, and stock nutrition.”

Regarding Sir Albert Howard’s “Indore” Process for providing Humus, Alma Baker has not “gone into the details of the immensely valuable work inaugurated by Sir Albert Howard in his “Indore” System of Agriculture in India and elsewhere, because in so far as the application of living humus from compost material to impoverished soils is concerned, they are similar in some respects to those advocated by Rudolf Steiner, both as regards the forming of compost heaps and aversion to the application of mineral fertilizers to the soil. Rudolf Steiner however goes much further in his teachings on agriculture as to the definite requirements of plants and animals.”

50,000 copies of this pamphlet were printed: they were not for sale, but were distributed to all those who were interested in the content.

In July, 1939, Alma Baker published a new treatise “Peace with the Soil” including an extract from a letter from the Rt. Hon. Col. Sir R. H. Dorman Smith, M.P., then Minister of Agriculture, to Mr. C. Alma Baker: 31st August, 1938, “I have read this paper with the greatest possible interest and do realise that it is a document of first class importance.”

“Those of us who are interested in the question of the land and its influence on our national life will be very grateful to you for the work you have done.”

This second pamphlet contains the following dedication:

“this treatise “Peace with the Soil” is an amplification of views expressed in my earlier work “The soil and its products”; it is recommended that the two be read together.”

“In the twilight of a long and full life devoted to experiments in soil problems in outlying parts of the Empire, I have written two works entirely from a sense of duty to my fellow-men. They constitute an appeal for the re-establishment of

**Health in the Soil**

**Health in Plants and Animals**

**Health in Man.”**

This pamphlet also was not for sale, but anyone interested in it was at liberty to copy or use it in any way thought fit, provided such copies or extracts were distributed free of charge.

Alma Baker’s last publication is the above-mentioned comprehensive book “Labouring Earth”. Lord Addison calls this book in his introduction a “challenging book”. It contains an enormous amount of interesting detail and we can only recommend the study of this book to all those who are interested in agricultural problems. We can only quote a few passages.

Chapter I, page 23: “I set out my views for critical consideration; if they are sound I shall have helped my fellow-men to live more healthily and consequently more happily. My plan is to consider what has happened to the earth, mother of us all, since production was speeded up as a national policy for all nations. My plan is to consider what has happened to mankind while the earth has been exploited and thrown out of balanced cultivation. Finally I hope to produce some reasonable theories of saner methods that may yet enable us to win back what we have lost through a period in which we surrendered to greed and haste and endeavoured unwisely to force the pace of Nature for purely commercial ends. At least I can claim, that I am no armchair investigator. I have been the servant of the soil for more years than I care to count, and have learnt through the results achieved that Nature can be conquered only by obedience to her decrees.”

In Chapter II, on National Health, Alma Baker quotes some figures in connection with sickness and curative treatment in Great Britain, which all run into millions of pounds (such as the cost of treatment and maintenance of the sick: £85,000,000): but the total outlay on Medical Research is only £200,000 a year.

Page 27. "I am concerned with the question of health of the people and the production of sound crops from healthy soil, but I must turn aside to note the statement in the report that £3,000,000 per annum is the sum alleged to be spent in newspaper advertising of patent medicines and "health foods". The British Medical Association has published some valuable books on patent medicines, setting out the claims made for them, an analysis of their contents, and a statement of their cost. If these revelations will not stir authority or rouse a credulous public to respect its internal organs, surely nothing can. The Select Committee on Patent Medicines reported twenty-five years ago:

"For all practical purposes British law is powerless to prevent any person from producing any drug and making any mixture whether potent or without any therapeutical activity whatever (so long as it does not contain a scheduled poison) and advertising it in any decent terms as a cure for any disease or ailment, recommending it by bogus testimonials and the invented opinions and facsimile signatures of fictitious physicians and selling it under any name he chooses, on the payment of a small stamp duty, for any price a credulous public will pay."

Page 30. "Turning to nutrition, the report remarks that satisfying appetite is not enough. People may do this and still suffer from malnutrition if they are eating the wrong food, i.e., that which lacks important protective elements. It is a thousand pities, that the statement halts here, after coming so near to the goal. If it had gone on to say that Nature supplies the right food so long as the soil is not defiled and tampered with, and so long as the food is not improperly handled between the fields and the table, the whole problem would have been set out. Then the conscience as well as the common sense of the community would have been helped to function. The Association was in sight of the goal, but those who speak for it forgot to observe that you cannot cure malnutrition with denatured food."

Page 31. "The report comments adversely on those large-scale advertisements in papers that direct the public to eat foods for which the advertisers advance extravagant claims. They lay great stress upon the value of milk as an aid to the under-nourished, but I would like to put this question to them. Is it not only possible, but very likely, that the saving grace of the milk will be lost, or at least greatly reduced, on over-mineralized pastures? Can anybody deny that there are far more sick cows than there used to be? As I have pointed out, replacement in New Zealand is over 30% annually, and such complaints as mastitis and tuberculosis are greatly on the increase. To hear experts talk about cows and tuberculin tests suggests that the trouble is far more serious than the man in the street, or rather the woman in the house, has learned to realize. I have been told on good authority that certain butchers in the West of England were complaining more than a couple of years ago that the offals of animals from highly mineralized pastures would not keep. There is something terribly significant about this."

Page 37. "I want to insist that the gradual depletion of the earth's fertility is quite a new outrage, if we think in terms of the earth's age: relatively as new as the bombing of undefended cities from the air, and the destruction of merchant vessels by assassins travelling under the sea. In the

history of our world the destruction of the soil and the destruction of civilization as constituted in our time are both affairs of yesterday: even “villanous saltpetre” is not old in relation to the world it has injured. It was only a hundred years ago – since 1840 to be precise – that the chemist began his terrible invasion of the soil. Whatever the colour, the creed or nationality of the agriculturist, he is well aware that down to a few years ago the living fertility of the soil has been fostered and maintained by nature’s own methods: residues of plants and animal life had gone through such necessary process as nature has ordained. Her procedure in the outward aspect visible to the simplest among us, is plain enough – a revival of the living organism through marvellous residues known to mankind as humus, but not yet completely understood: it is the material to which the earthworms and micro-organisms lend the aid without which life could not endure, the material through which mysterious symbiotic development takes place. In a welcome article “The world beyond the Eye in Agriculture”, Dr. W. J. Stein reviewing certain works (including Dr. Wakesman’s great volume on humus) emphasized the author’s contention that humus is rather a certain state of matter than a mere affair of chemical constituents, and that the problem of humus and soil belongs to the domain of biology. As I see it, humus helps by the aid of soil micro-organisms to maintain a certain harmony between man, animal and soil. It is a mystery, this ever active force that maintains fertility on the few inches of earth from which humanity and the animal and vegetable creation draw breath. We must approach it with reverence and not think of it as something that we can control by the aid of crude chemicals”.

Page 39. “I have come to the conclusion after many years of closest study, that the addition of man-made dead materials such as chemical “fertilizers” to the soil not only checks life but affects adversely the life in the atmosphere around it which is essential to the growth of the plant until its life is ended.”

Mr. Alma Baker speaks about the League of Nation’s report on page 46: “I seemed to get to my own particular line of country when I read in the report that the United States of America in ten years raised its tractors from less than a quarter of a million to upwards of 800,000 between 1920 and 1930, and that in the same time the number of horses fell from 17,000,000 to 13,000,000. In 1918 14 combine harvesters were at work in Kansas. (As most people know these are machines by which two men can harvest 50 acres of wheat a day). Eleven years later there were 23,000 combine harvesters in Kansas– and to-day Kansas is in the Dust Bowl. Here we see the cause and the effect – if you can harvest 50 acres a day with two men, you do it over as wide an area as possible and if you can do it in one year, why not do it again in the next? Then the cheapest way of dealing with the land is to run the tractor ploughs over it and make a bare fallow. It all sounds so easy until Nature intervenes, and sends her dust storms to blow your surface soil into the ocean, a thing no dust storm could have done had you been practising mixed farming and followed your corn with a green crop.”

Page 94. “Now, agricultural scientists we have enough and to spare, while they continue along their present narrow lines of investigations, but there is an enormous piece of work before them if they will only expand their outlook and undertake to meet the need of the hour. I would like to set out the task I regard as vital:-

1. They should do something to understand and to explain to simple farm folk the parts played in food production by the earth and the cosmos, the difference between the forces

and substances and the effect of both upon plant life and growth. At present most of us know much or little about substances, and little or nothing about forces.

2. They should enquire into the ascertained effect of administering plant stimulants in the form of artificial manures and the possible or probable results of continuing along this dangerous road.

3. They should study the best method of agriculture and the best use of organic substances to replace dead synthetic manures, restore lost fertility to the soil and enable the farmer to produce natural healthy food plants for man and beasts and a reasonable profit to himself. They should inquire into the value of composts and the extent to which these can be made available.

4. They should inquire into the value or lack of all advertised plant stimulants and advise the public. They must reach the simple farmer and tell him in a fashion that he can understand, something of the danger of the methods that have been practised of late years. I suggest that the only way in which the work to be done can be followed out is along the lines of abandoning the materialistic aspects, recognising the land as something that is living its own life, fulfilling its own part in a divinely ordained programme and insisting in its own silent fashion upon the observance of many laws of which at the present stage of our evolution we know little. I want them to take as their goal the development of national health through the production of healthy food. It is for them to bring the cosmos home to the farmer and their task will be lightened if they will undertake it with real determination guided by the fact that there is a traditional husbandry that has never been lost. When the world was young, farmers were in touch with Nature and they can recover the lost touch if they are set upon the right lines.”

Page 107. “The case for mineral fertilizers can be put in a nutshell. We are told that there is not enough organic manure to go round the farms. This being said, no further case remains. I would like to approach this problem by suggesting that it is possible for a remedy to be worse than the disease: it is also readily possible for the remedy to be ineffective for more than a very little while and to leave the patient worse than it found him.”

Page 108. “Modern fruit culture has resulted in an increase of troubles due to poisoning by lead, arsenic and copper, all of which are used in sprays. A study of Californian apples made a few years ago showed that the lead arsenate in them was very many times as much as the highest quantity that can be safely taken in food. Public warnings were issued. There is a very vicious circle here. Poison sprays are used because insect pests are on the increase, and we get the insect pests because they are Nature’s challenge to the man who, in search of larger and heavier crops, throws her balances out of gear. Doubtless many who have not investigated this question will cry: “Nonsense”; informed people will not. This reaction to artificial stimulants seems strange, even unreasonable, until we grasp a fact that has been established by Dr. Steiner and confirmed by his followers, that if we change the life of a plant by over-stimulation the whole of the life-force is spent on a greater production and there comes side by side with this a certain weakening of the powers of healthy reproduction and of resistance to insect pests. A healthy plant in a healthy environment grows away from disease and is powerful to resist insect attacks: a weak plant falls a victim, and then come the poison sprays, in ever increasing quantity, to kill the insects and per-



haps to poison the produce. Certainly there is grave reason to believe that the nutritional value of the plant is upset.”

Page 156. “Here is a simple problem of putting first things first. Of what use is it for the Governments to plan increased productions, for agricultural engineers to devise bigger and better machinery, for service on the land to be made more attractive, for subsidies given for wheat and sugar beet, for Boards to be established for milk, pigs, and the rest, if the quality of these products is to be vitiated by a sick soil which we continue to poison or to neglect. I would like to see a quiet but speedy awakening to the needs and the rights of the land, but I am convinced that an awakening of some kind is coming soon, and I pray it may not be too violent. The man who betrays his country is denounced as a traitor: the man who betrays every man’s country, Mother Earth, is subjected to no penalties. Qualified engineers can tell within a very few years the life of a mine: they know it can yield so much and no more. Why has nobody applied the same kind of calculation to the earth and explained to the general public that every virgin soil has so much stored fertility and no more, and that if it is taken without replacement that soil must die?”

One chapter of the book is dedicated to the teachings of Dr. Steiner and Alma Baker ends this chapter in the following way: (page 208) “It is a curious and encouraging truth that in spite of his strange theories his complete conviction and his indifference to criticism, ridicule, distortion and mis-statement, Rudolf Steiner’s teachings have not only survived him, but are slowly but surely building up an enduring monument to his life and work. When a man eminent in many spheres can say of himself people will remark ‘what a pity he has gone suddenly crazy!’ or ‘all this will seem utterly mad’, we can but recognize a fine, rare courage, for ridicule is among the hardest burdens that a sensitive pioneer can be called upon to bear. No mere research worker of ordinary calibre, Rudolf Steiner was sustained by a faith that was as the shadow of a great rock in a thirsty land: in spite of the hatred and opposition that came to him from all centres of reaction lie persisted to the end, and to-day his posthumus reward grows”. “Let us praise famous men.”

Another extremely interesting chapter is the one dedicated to Sir Albert Howard, formerly Director of the Institute of Plant Industry at Indore in India and founder of the method of soil regeneration to which he has given the name of “Indore Process”.

(Page 223). “His “Indore” process of composting is spreading throughout the East, where it is regarded as a commercially sound proposition. It is being developed more slowly at home, where vested interests have a powerful voice in the decision as to whether man shall live on healthy produce which can be raised from the soil for the soil, or shall die for the greater glorification of business. He has written words over which I like to linger, because they express my strongest innermost conviction: the earth has been exploited for gain-starved, poisoned and over stimulated at one and the same time by artificial manuring, de-timbered, over-grazed, over-stocked and over-cropped. By the time science was called in to undo the results of her own folly so far as was possible, the balance between soil and plant had been rudely disturbed: there was no fertility left to work on”.

Page 223. “For my humble opinion Dr. Rudolf Steiner and Sir Albert Howard are two men who have done more for mankind than almost any of their contemporaries. The man who eradicates disease is worth more to mankind than the man who cures it. Steiner, among those who have passed, and Sir Albert Howard, among those who are happily still with us have called atten-

tion to the most serious danger threatening mankind and have pointed out the simple effective road to change.”

(Page 224. “Sir Albert Howard’s method is the outcome of tradition. He is completely honest and admits that he sat at the feet of the Indian ryot and absorbed and accumulated wisdom of the years.”

The originator of the “Indore Process” – and it may claim originality even if it be the modern adaptation of an old wisdom – has given forty years to study the health of crops and live-stock and to research into conditions that create disease or help to resist it.”

“He comes from a family of farmers and began his research forty years ago in the West Indies, where he studied tropical agriculture. After a short spell at Wye College in Kent, where he was especially concerned with hop diseases, he was appointed Imperial Economic Botanist to the Government of India at Pusa, where he was left with a free hand to make his own experiments. He says that his best teachers were the Indian peasants themselves and in a few years he had learned how to grow healthy crops without any of what he has described as the “expensive paraphernalia of the modern experimental station”. He made some astonishing discoveries which are borne out by the researches of Dr. Steiner, who was working to the same goal along his own lines, each man seeing the truth through windows of different coloured glass.”

“He found that insects and fungi are not the real cause of plant diseases but are rather effects of unsuitable varieties of improper acts of husbandry. He concluded that the policy of poison spraying, so appallingly popular in this country to-day, is unscientific and unsound and that we ought to be concerned with growing healthy crops that would not stand in need of these abominable aids to life. Then he turned to the diseases of cattle and discovered that wellchosen and well fed animals are insusceptible to the prevalent diseases, including foot and mouth disease and rinderpest. The time came when he could place his own healthy animals among diseased ones and nothing happened”.

(Page 226). “Sir Albert Howard told the story of his life experiments at the meeting held in the Town Hall of Crewe in March, 1939, to which reference has already been made elsewhere. He and Sir Robert McCarrison were the chief speakers, and he wound up his address by saying that humus feeds a plant by providing indirectly the small quantities of nutrient needed by the green leaf for growth, while artificials only supply salts for the leaf and are consequently unable to influence quality. He went on to state what many connoisseurs have noted, without being able to give the reasons, that meat and cheese from some of the celebrated pastures of Europe have lost both taste and quality, and he attributed the loss to the use of sulphate of ammonia which, unfortunately, is still recommended by the authorities”.

“Sir Robert McCarrison is the authority who told us about the vigorous and healthy races of North India who live on freshly ground whole wheat flour, milk pulses, fresh vegetables and occasional small quantities of meat. He says that food is the dominant factor in determining man’s physical endowment, powers of endurance and resistance to diseases. He tells us that the human stomach is designed to digest all sorts of natural food but when we present it with sloppy, disintegrated, highly sweetened and easily digested food, it is relieved of half its work and consequently becomes functionally inefficient.”

(Page 227). “Proofs of the deterioration that follows the use of artificial fertilizers have been forthcoming and are still forthcoming from many quarters, but a significant English example

comes from Lord Lyminster's estates in Hampshire, where wheat straw taken from fields manured with organic matter serves ten years as roof thatch while straw from similar land manured with artificial lasts only half the time".

The last chapters of Alma Baker's book are dedicated to proposals when peace returns, and plans for the future.

These are a few examples to illustrate the present situation. We have not even the excuse that people do not know about the critical state of affairs in Agriculture. You can read it in many books written by famous personalities and side by side you have the advertisements for artificial manure and poison sprays: demands for speeding up plant growth, for getting more and more in less time, and with less natural means. It is "Science" which asks you to do the one thing, and it is "common sense" which asks you to do the other things. There is even "Science fighting against Science".

We are at war not only with the outside world, there is another war going on within our life and this war we will also have to fight to the bitter end.

## **Chapter II.** **Our Tasks for Tomorrow.**

The agricultural Problem is a World Problem. It has to deal with the welfare of Mankind. It is not a question of personal likes or dislikes, or even national interests. What would be the use if only one country were able to produce healthy crops and neighbours could not do the same? Our outlook must become world- wide, our knowledge universal, and our love and understanding for humanity all-embracing.

The immense task we see before us seems to consist of three main parts:

### **Agriculture    Medicine    Education.**

These three: Agriculture, Medicine and Education should not only stand side by side, helping each other, but in reality should melt into one another, becoming a living entity: "**World Agriculture**".

The food the farmers grow is meant to build up man's physical body, and to give him strength to develop his mental capacities. It is a question of health, and therefore a thorough medical knowledge must stand side by side with all the measures agriculture wants to introduce in food production. But again we must say – not our present medical knowledge: it must be a medicine based on a true understanding of Man: a medical knowledge which can look on the human being in its threefoldness of body, soul and spirit. A medicine which only treats the human body and forgets that in this body is incarnated a soul and a spiritual being, is insufficient. It is as harmful to the human body as an agricultural science – which only looks at the chemical constituents of the soil and forgets the Life – is to the earth. Such a science feeds the living plant with dead salts, and ignores all the cosmic forces streaming through a balanced soil, so that at last it even takes away the soil altogether, and offers only a salt solution with artificial support to the growing plant!

We need a medical science which can understand the three-fold human organism as expressed in his nervous system, circulatory and breathing system, and metabolic system. A science which

looks on Man as a combustion engine which burns food, as the motor car uses petrol, is not only useless, it is a dangerous science. It causes us to lose our dignity as Man.

The medical science we have in mind, must also have a universal outlook, and be able to look upon Man as standing on Earth and reaching to the Heavens, the whole Cosmos reflected in his head, the Sun's forces circulating in his heart, and the Earth power strengthening his limbs and streaming through his metabolic system.

Thus we visualize a "World Agricultural Movement", comprising in itself three main sections with their specific tasks.

The specific tasks of the **Agricultural Section** in this World Agricultural Movement would consist of:

1. Practical advice to Farmers and Gardeners all over the world, to help in their special problems of cultivating the soil and its products, and the rearing of live-stock.
2. Research. Much research work is still to be done. Rudolf Steiner's suggestions were meant for our countries. They must be altered accordingly if we move to the Far East or to the Far West. The co-operation of many scientists in different parts of the world is necessary.
3. Education. We need the training of agricultural teachers: men and women thoroughly trained in practical work and in science.

Of course here we can only outline a very rough sketch. Each of these three items should be elaborated in many details.

The specific task of the Agricultural-Medical Section would be:

1. Practical advice in all the problems of Nourishment and Diet;
2. Public Health;
3. The cultivation of medicinal herbs;
4. Veterinary medicine, etc.

The specific tasks of the Agricultural-Educational Section would be:

1. To convey the right ideas about food, nourishment and plant cultivation to children even in the elementary schools.
2. To educate the public. This is a very important task. At present the public is educated by grocers, chemists, druggists and health-stores. They gain their knowledge mostly by reading the different recipes on the food packages they buy, or on the fertilizer packages, or by seeing advertisements which catch the eye. The education of the public could be done through literature, by books which are easy for everybody to understand and through lectures.

What is needed in order that such a scheme should come to life? **Money** and **suitable collaborators**. Of course much money is necessary and the collaboration of many people all over the world. Do not say that there is not enough money available. If you have studied the content of this book, you will have found out that millions of pounds are lost each year through animal diseases, millions are spent for advertising artificial fertilizers, etc. Why should there not be somewhere some millions for a good purpose, for mankind's sake?

But all the money of the world would not help, if we are not able to kindle in men's souls a burning flame of enthusiasm for this work: if we cannot make those who wish to collaborate understand that they must bring with them into the work great and unselfish love urging them to do something for mankind.

## CONCLUDING NOTE

Much time has elapsed since the completion of the manuscript and the actual finishing of the print: all the long war years from 1940 to 1946. Many obstacles had to be overcome, from the paper restrictions to the shortage of labour, but at last the work is done.

Now I want to thank in the first place, Rudolf Steiner who entrusted me with the beautiful task of making the necessary scientific investigations connected with his advice.

Then I want to thank all those who helped me with the actual work carried out in the "Biologisches Institut am Goetheanum" in Stuttgart (Württemberg), and, later, in the "Biological Institute" Bray, Berks. In the first place Mr. W. Kaiser must be mentioned: he worked faithfully for many years until the beginning of the war, placing his skill as a mechanic at my disposal, working hard in the garden or in the dark room, making most of the beautiful photographs contained in this publication and in my previous ones: and digging the hole for the experiments beneath the surface of the soil. He worked ceaselessly, if necessary day and night. Then I have to mention Mrs. L. Deman, who helped with experiments connected with "smallest entities", Mrs. Lilian Schickler, who specially helped with weighing and feeding the white mice, and Miss J. Beck, who assisted with the experiments carried out beneath the surface of the soil.

Furthermore, I want to express my deepest gratitude to the many friends who helped, and are still helping financially, so that the work can be done. From all parts of the world help has come: from America, England, Germany, Holland, Portugal and Switzerland.

In writing this book I was helped by Mrs. E. C. Merry and Miss Gladys Knapp who read the manuscript. Miss Knapp also drew the graphs and sketches, as well as the title page and read the proofs. I want to express my sincerest gratitude for her kindness and understanding.

But all this would not have been enough, if more friends had not come to my aid, contributing generously towards the printing of this book. Many have helped, and I cannot mention them all: they would not even like it. But I want to say: "Thank you for selfless contributions to a good cause, for mankind's sake".

Most of the blocks in this book were made by the Gloucester and Three Counties Photo Engraving Company. I would like to thank them for making these as quickly and beautifully as possible under the present difficult circumstances. I also want to thank Mr. Jennings and his staff for devoting so much care to the printing of the book. I appreciate their warm interest and willingness to co-operate, which made it possible to overcome the various difficulties arising from war-time conditions,

As far as the contents of this book is concerned, I tried to carry out each experiment as conscientiously as possible: to repeat it again and again until I was certain of the result. Maybe some readers will find, that I have expressed my convictions with too great a frankness, that I have not always been polite enough. But the times are so serious in which we are living, that if we want to make any impression at all, we have to speak in strong terms. Re-reading the manuscript for the last time, I hesitated for a moment at the sentence: "Let us become true scientists and lift up the priceless jewel which has fallen into the dust". I could hear the critics cry: "What an outrage to science!" It is not meant as an outrage, and I cannot take out this sentence. The case is the same with many other sentences. I do not overlook or under-rate the high technical and intellectual standard natural science has achieved. Only to where does this science lead us? It is

a perfect, pure, objective, impersonal science. Its latest and “greatest” achievement has been the release of atomic power: the atom bomb. One invention gives birth to another. The one scientist invents the atom bomb: the other has to invent the anti-atom bomb to protect mankind against the terrible weapon just invented. A whole Anti-Atom-Fleet is being planned, so we read in to-day’s Daily Mail (1st January). “Revolutionary plans for Britain’s new Anti-Atom-Fleet will be made in a report to be delivered next March by a special committee to be appointed by the Admiralty Commissioners”. We can be certain, that after the Anti-Atom-Fleet has been created, another scientist will invent a Super-Atom-Bomb, against which terrific destroying power, the Anti-Atom-Fleet will again be too weak: never mind, there will again come another scientist to plan a Super-Anti-Atom-Fleet.

What can be done to wake up Mankind? This science is of a purely destructive character. It is pure intellect, without a heart beating for mankind. It is a priceless jewel fallen into the dust. Scientists have to make the first step to redeem it again, to create a new **“Science of Life” which places Man in the centre, which looks at everything from the standpoint of Man, and not from the standpoint of Science.** Man has to be understood as a spiritual being. He has not only a brain, intellect, he has a soul and spirit. Present day science is purely intellectual. Thoughts are produced and seem to run on automatically. We are living in illusions, in a world of make believe. We are asked to accept as food, things which look like, or taste like, or smell like real food, but simply are not. A cordial which is “orange-flavoured” or “lemon-flavoured”, or grapefruit-flavoured” does not give us the forces of these fruits. We cheat ourselves with open eyes (or are they open?). Why produce false sensations? And who is doing all this cheating? Science, who offers so, us generously, all these substitutes. We cannot be offered a substitute for life. Let us fill this “pure” science with a soul and turn it round from the downward road into material destruction, to the path which leads upwards to spiritual perfection. Matter and spirit are not opposed if we recognise that matter is permeated with spirit.

Do not let us release the atomic power. Do not let us set loose upon mankind the evil destructive forces – but let us strive for the good and constructive power hidden in matter. Otherwise, we will find out too late that we have created a boomerang which recoils towards us, destroying everything. Let us release gently the forces behind matter, in potentizing substances and thus bringing to life the healing, remedial effects, but not in an explosive, destructive manner. In 1923 I published the first experiments carried out with “smallest entities”,\* following advice Rudolf Steiner had given me in 1921. And here in England Rudolf Steiner lectured at Penmaenmawr about “The Evolution of the World and of Humanity”. He mentioned during these lectures, the publication of these researches carried out in the Biologisches Institut am Goetheanum (Stuttgart), and I would like to quote a few sentences spoken then by Rudolf Steiner: “Along these lines we have succeeded in dividing what is merely material, so that what is really the Spiritual part becomes apparent. For if you do not simply split matter into atoms as the atomists do, but reduce it to its functions and forces, you prove your goodwill, as I might say, to pass through the Material itself, into the Spiritual”. After describing these researches more in detail Dr. Steiner continued: “In future, if this result of research is valued aright, investigations will not merely be made along the lines of scale and measure, the laws of nature will not merely be investigated

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\* L. Kolisko: *Physiological and Physical Proof of the Efficacy of Smallest Entities*, Stuttgart 1923. (Physiologischer und Physikalischer Nachweis der Wirksamkeit Kleinster Entitäten).

atomically, but it will be recognised that in all matter a rhythm can be discovered, and that the rhythm in the occurrences of nature reproduce the rhythm of the cosmos”.

Science has progressed further from 1923 to 1946. We do not only split matter into atoms, we can even split the atoms themselves, and have in our hands a most powerful tool for destruction.

We can look at matter as being in a neutral state. Man can use it in two ways – either for good or for evil. We can release the forces behind matter gently by “potentizing”, or in an explosive way by splitting its atoms. Scientists want now to find some better uses for atomic power, and are trying to find a way to introduce it into agriculture for stimulating plant growth. This is told to the public in an article: “Science Survey”, by Ritchie Calder, in the News Chronicle of Wednesday, February 27th, with the title, “Fission Farming”. The term “fission” means the energetic disintegration of uranium. The above article states that “Fission Farming” where the crops will be radio active, is the latest ingenious project of the atom splitters. The idea is really ingenious. Radio active elements – carbon, phosphorus, nitrogen and so on which are given the temporary characteristics of radium, will be fed to plants. Since these elements are radio active they can be traced, and the scientists hope to solve by this means the riddle of photosynthesis, “the device by which plants trap and use the sun’s energy”. They hope to solve the riddle of “chlorophyll”, or how the plants collect carbon. So far so good. But these radio active substances are hoped to provide clues to many other “processes in plants and in human bodies” and last, but not least, they are to be used in treatment too. “Radio active iodine, when administered, rushes to the thyroid, and, if active enough, can arrest the abnormal growth which sometimes occurs in that gland. Or radio active phosphorus can be used to treat leukaemia – sometimes called “the cancer of the blood” – a disorder in which the white blood cells run amok. The radio active phosphorus is carried into the bone-marrow where the cells are being mass produced and acting like localised radium, restricts production to normal. If, from the atomic pile we can get enough radio-phosphorus to control this disease it will be a grim compensation. For leukaemia is the disease of which so many, unhurt by the explosion, died later at Hiroshima and Nagasaki. The hard X-rays released by the bomb explosion destroyed the proper functioning of the bone-marrow.”

Here is the point where the danger lies. Are we right in introducing radio active forces into human bone-marrow? There is the source of life, where our red blood is generated. Our whole being is linked with the mysteries of blood production. Are we entitled to touch this source of life? Do we already understand what blood is and do we understand what the radio active force is, and can we allow these two elements to work upon each other? It is different if we use radio active elements in a laboratory experiment, as tracer to study various processes in nature – and if we introduce it into the human body. The atomic energy has destroyed many lives through after-effects, as mentioned in the above article. The blood was attacked directly, and now it would be a “grim satisfaction” to heal leukaemia with radio-phosphorus. Are we not attempting to drive out the devil with the help of Satan?

Maybe, what is described in the article “Fission Farming” will never come true. Maybe science will abandon, after careful investigations, these dangerous experiments with the human body. But it may as well be, that, in future, diseases will be treated not with ordinary remedies, but with radio active remedies. Mankind will be treated from outside with X-rays, and from inside the various organs will be attacked by radio active remedies. Between all these radiations the human

organism must fall into decay. The path seems to go straight on in only one direction – towards the destruction of plant life, animal life and ultimately, human life.

Mr. Winston Churchill quite recently summed up the present world situation when he received the freedom of Aberdeen, saying: “This is a time when hatred is rife in the world, and when many mighty branches of the human family, victors or vanquished, innocent or guilty, are plunged in bewilderment, distress or ruin. The world is very ill. Measureless injury has been done to much that the 19th century would have called Christian civilisation. All the leading nations have been racked by stresses which have blunted their sensibilities, and have destroyed their agreeable modes of social intercourse.”

“Only science has rolled forward, whipped by the fierce winds of mortal war, and science has placed in the hands of men agencies of destruction far beyond any development of their common sense or virtue.”

But we have to overcome the hatred and turn it into love. Otherwise we are going on to “sow the wind and reap the storm”. Let us abandon this destructive path and turn to the source of life. Let us create a new science of life which really understands the inter-action of the whole cosmos with earth and Man.

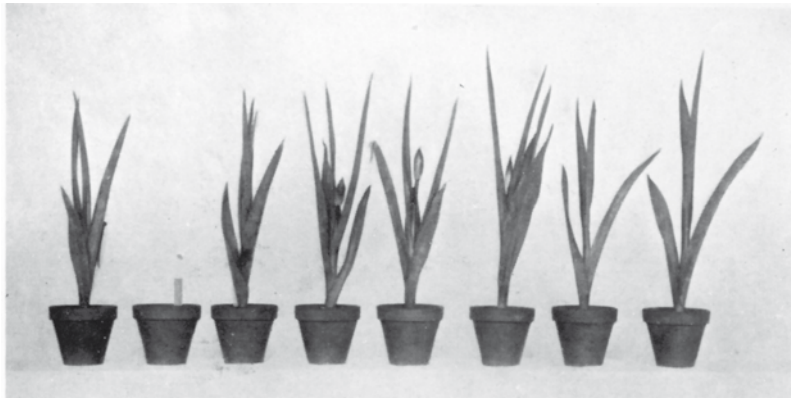
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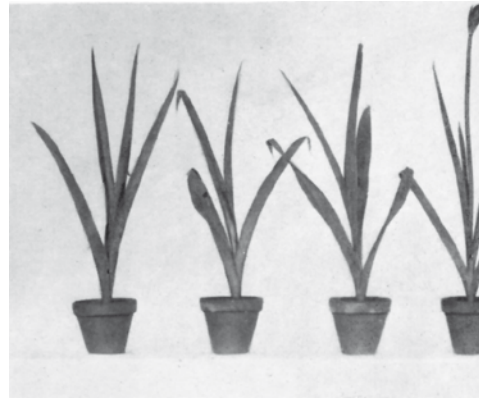
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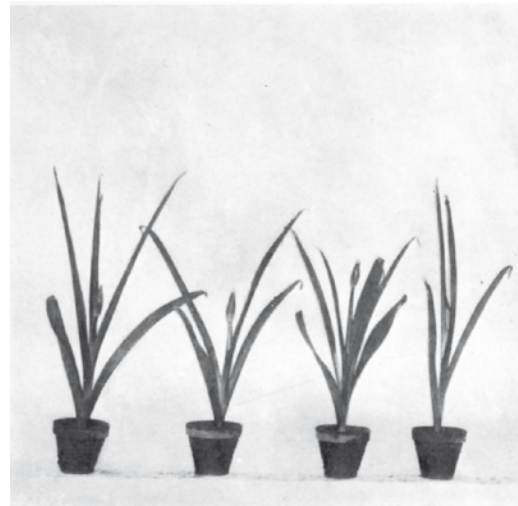
Water 2. 3. 4. 5. 6. 7. 8.



9. 10. 11. 12.



Water 2. 3. 4. 5. 6. 7.



8. 9. 10. 11.



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15. 16. 17. 18. 19. 20.



21. 22.

**Hyacinthus candidans, grown under the influence of silver nitrate (early stage)**



12.



13. 14. 15. 16. 17. 18.



19. 20.

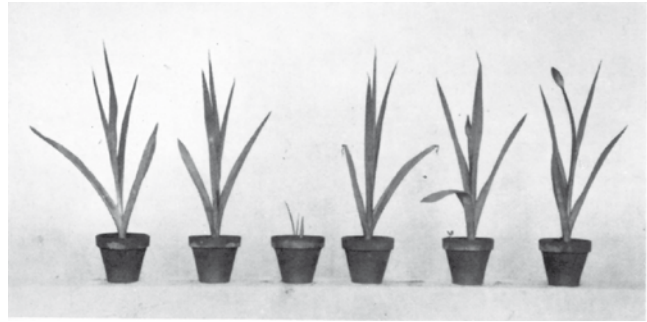
**Hyacinthus candidans, grown under the influence of silver nitrate (late stage)**



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