

SUMMER SCHOOL AND CONFERENCE ON
BIO-DYNAMIC FARMING
Home Farm, Betteshanger, Eastry, Kent.

July 1st to 9th 1939

REPORT OF PROCEEDINGS.

This report is not intended to be used as a treatise on Bio-dynamic farming for general reading. It has been prepared for the use and information of those who were present for all or part of the Conference.

[Third paginated draft - 13th Jan 2021]

PROGRAMME.

Date	Morning 9:30 – 12:30	Afternoon 1:30 – 4:30	Evening 7:15 – 10.00
Sat 1			Opening Address "Essential of the Bio-dynamic Method" Dr E Pfeiffer
Sun 2	Tour of manure and compost heaps	Soil structure demonstration	Lecture: "The Soil a Living Organism" Dr E Pfeiffer
Mon 3	Preparation and Treatment of Manure and Compost	Preparation and Treatment of Manure and Compost	Lecture: "The Farm, A Biological Organism" Dr E. Pfeiffer
Tuesday 4	Farm Excursions		
	Miss Sargeant (Larkfield) A small Biodynamic farm	G.W.Finn & Sons (Nackington) A large intensive farm	Lecture "The Biological requirements of the Human Organism" Dr G. Scott Williamson
Wednesday 5	Treatment of Fruit Trees	Discussion on the conversion of the Home Farm, Betteshanger	Lecture (at Scawsby) "The Health of Livestock and its dependence on Feeding and Soil" Dr E O Eckstein
Thurs 6	Farm Excursions		
	E D Rice (Tilmanstone) 2000 acres mechanised	S E Agricultural College, Wye A profitable mixed farm	Lecture for Gardeners Drs Heinze and Pfeiffer
Friday 7	Composting for Gardeners – Manure treatment in yards for farmers	Lecture amplifying Weds evening Dr E O Eckstein	Public Lecture (Scawsby) with lantern slides "The Fertility of the Earth – its preservation and Renewal" Dr E Pfeiffer
Saturday 8	Talk and discussion on established BD Farms on the continent. Composting for Gardeners	Visit to Canterbury	Party and entertainment for. Members, farm workers and their families
Sun 9	Summary of proceedings – by the staff		

LIST OF MEMBERS OF CONFERENCE

Lecturers	
Dr. E. Pfeiffer	Goetheanum, Dornach, Switzerland
Dr. E. O. Eckstein	Goetheanum, Dornach, Switzerland
Dr. H. Heinze	Terlinde, Serooskerke, (W) Holland.
Dr. G. Scott Williamson	Pioneer Health Centre, Peckham, s.w.16
Members	
G. Bacchus	c/o Mrs. Crompton, Burstow Hall, Horley, Surrey.
M. C. Bridges.	Geddington Priory Kettering
N. B. Bagenal	East Malling Research Station, Kent.
Montgomery Butchart	c/o Hambledon Hill Fruit Farm, Child, Oke ford
Colin Cameron.	c/o Hambledon Hill Fruit Farm, Child, Oke ford
C. H. Clifford	Pioneer Health Centre Farm, Bromley Common
Miss Cross	The Priory. King's Langley, Herts.
David Edwards	<u>Pentre, Boncath, Pembrokeshire</u>
<u>James Ferguson</u>	Burrance of Courance, Lockerbie, Scotland
Mrs. Ferguson	Burrance of Courance, Lockerbie, Scotland
Hugh Finn	Vine scole, Nackington, Kent
Mrs Finn	Vine scole, Nackington, Kent
Miss Fisher	High Quarry, Crockham Hill, Edenbridge, Kent
Harold Gundry	The Grange, Broad Hanbury, Honiton, Devon
F. C. Inglis	c/o Farleigh House, Farleigh Wallop, Basingstoke
C. Kerruish	c/o G. W. Howie, Knockaloe, IoM
L. Kneale	c/o G. W. Howie, Knockaloe, IoM
Lord Lymington	Farleigh House, Farleigh Wallop, Basingstoke
Lady Mackinnon	High Quarry, Crockham Hill, Edenbridge, Kent
Jeffrey Mark	30, Parliament Hill, N.W.3
Lord Northbourne	Northbourne Court, Nr. Deal, Kent.
Lady Northbourne	Northbourne Court, Nr. Deal, Kent.
Miss Page	Horticultural College, Swanley, Kent.
D. A. Peters	The Home Farm, Betteshanger, Eastry, Kent
Mrs. Peters	The Home Farm, Betteshanger, Eastry, Kent
Dr. H. Pizer	South Eastern Agricultural College, Wye, Kent
O Elstrup Rasmussen	Ryegade 10, Aarhus, Denmark
L N Savage	Angola, Angola Rd, Worthing, Sussex
Miss Sargeant	Larkfield Hall, Maidstone
C Stansby	Hakgala. Whitehall, Lower Hardres, Canterbury
N L Tinley	South Eastern Agricultural College, Wye, Kent
W Whigham Jr	Highland Court, Bridge, Canterbury

THE FOLLOWING ALSO ATTENDED OCCASIONALLY	
Mrs W Curtis Green	Coldharbour, Northbourne, Deal
W Hogben	Updown Farm, Eastry, Kent
Sir Evelyn Howell	Fouracre, Staplehurst, Kent
Borlase Matthews	Great Falcourt, E Grinstead, Sussex
Mrs Mark	30, Parliament Hill, N.W.3
A Montgomery	Thorne, Minster, Thanet
Dr Innes Pearse	Pioner Health Centre, Peckham, SW16
E. D. Rice	Dane Court, Eastry, Kent
W. J. Rickards	Hoath Farm, St. Martin's Hill, Canterbury
F. A. Roach – Ministry of Agriculture	High Tilt, Hatch Lane, Chartham, Kent
J. Roberts	School House, Northbourne, Deal
The Hon. Mrs. Randal Smith	4, Hyde Park Square, W.2
G. Stoed	Finglesham Farm, nr. Deal
P. W. Stoed	East Northdown, Margate
R. Stoed	East Northdown, Margate

In addition to those named, a number of local gardeners attended the Lecture on Gardening and the practical work on Friday and Saturday mornings. Some local farmers attended the lecture on Friday evening.

Saturday, July 1st [1939], 7.30 pm

LECTURE BY DR. PFEIFFER

ESSENTIALS OF THE BIO-DYNAMIC METHOD

Summary

There are two basic questions to be considered. First the soil, its fertility and how it grows plants, second the feeding and health of plants, animals and men.

The soil is not simply mineral, but is a living organism in which there is a collaboration between mineral elements and plants and microscopic organisms. When conditions are favourable for this collaboration the soil is in a state of health.

There are many soil diseases. The final state of disease in a soil is represented by the now well known state of erosion. In this state the soil may form a hard crust which often cracks when dry; rain then runs off the surface and into the cracks, the edges of which are washed away until finally they coalesce and form streams or rivers of mud, eventually often removing the whole surface soil. Alternatively a dusty surface may be formed which is blown away by strong winds. In America the so-called Dust Bowl area so formed, is moving eastwards at 60 miles a year.

The cause of erosion is wrong farming practices which have prevailed because knowledge of the chemistry of the soil has been sought and applied before knowledge of the biology of the soil, but a fertile soil is not a dead thing; the difference between a living and a dead soil is measured by the presence or absence of humus. Humus is organic matter in the right state of decomposition. The principal agent in producing this state, which is known as the neutral colloidal state, is the earthworm. It is possible that Darwin's greatest contribution was his work on earthworms and vegetable mould.

The earthworm produces humus by eating earth and vegetable matter. These are mixed in the intestine which secretes acid and ferments, also calcium. The excrement is practically pure humus,

most of it in the neutral colloidal state. Biodynamic methods produce humus on a large scale by composting in much the same way as does the earthworm on a small scale. The colloidal state is the only state in which material is usable by living things. It is the state in which all matter is found in living bodies, animal or vegetable.

Minerals, in the presence of humus, do not behave as they do in its absence. It is well known that plants growing in a nutritive solution show weakness if a necessary salt is missing. It is not so well known that a plant will grow well in spite of a mineral deficiency if certain other factors are present. A plant can be grown in a mineral solution which is deficient if a minute quantity of humus is added to the solution, even though the humus does not contain that mineral in appreciable quantity. Thus it is the humus which gives life to plants and makes up for so-called mineral deficiencies in the soil.

Humus can be made from manure, any organic matter, together with earth, water, air, calcium and certain ferments. Temperature, circulation of air and moisture must be controlled. Incidentally, proper treatment saves much of the nitrogen ordinarily lost from manure, which amounts to about 50%. This loss can be reduced to 5 or 10%.

Proper humus treatment of the soil reduces plant diseases by increasing the development and assimilative power of roots. The study of roots has been much neglected. There may be as much as 130 miles of root in a maize plant.

To the heap in which humus is being made we add preparations which direct the fermentation, much as yeast directs the fermentation of dough. These preparations are derived from certain plants, yarrow, camomile, nettle, oak bark, dandelion and valerian. These plants are buried 6-12 months in contact with certain animal organs and are thus fermented until a perfect humus is formed. Minute quantities are then used in compost or manure heaps. The type of property to be found in each of the above-mentioned plants is exemplified by the fact that a limited number of plants of camomile in a wheat field stimulate the growth of the wheat, whereas too many such plants arrest it. One part of camomile extract with 400 million parts of water will double

the growth of yeast.

So the first essential of the method is the proper treatment of organic matter which is to be applied to the soil.

We can also influence directly the growth of plants by the use of other preparations. That known as 500 is made of cow manure, fermented under special conditions. It is mixed with water and applied directly to the soil in very small quantities. It has a pronounced influence on the development of roots.

Preparation 501 works by assisting the assimilative processes which go on in the leaves. The main nutritive elements for plants are water and carbonic acid with a very small proportion of salts. Carbonic acid is absorbed by the plant through the action of light on the chlorophyll of the leaves. The plant making the best use of light is the healthiest. Preparation 501 is applied direct to leaves. It is made of rock crystal and has a good influence upon the use of carbonic acid by the plant.

So the second essential of the method is the direction and control of plant growth by the use of these two preparations.

We cannot, however, achieve success by correct manurial treatment alone. Success depends on many other factors, most of which come into the category of ordinary farm management. Among these are the methods of cultivation adopted, suitable rotations with a proper alternation of humus consuming and humus maintaining crops, and the proper understanding of livestock and their management. Many of these matters will be dealt with more fully later on this week. If the wrong practices are followed in any of these departments of farm management, the advantages of the Bio-dynamic method cannot be realised. The third essential is therefore a sound system of farm management.

A few words may be added in conclusion about costs; the method requires some additional labour, but this cost should ultimately be saved as among the results to be anticipated are easier tillage and a greater resistance to disease in soil, plant and animal, with a corresponding reduction in actual expenditure.

Discussion

Question: Why does fermentation occur and how does it differ from decay?

Answer: Decay is decomposition finally into ammonia, carbonic acid and water, which are the basic elements of organic substance. In their elemental state they are not living. Fermented substances are broken down in a different way which alone is capable of producing suitable food for plants.

Question: What kind of farming destroys humus, in view of the fact that some intensive farms are apparently increasing in fertility?

Answer: An extreme example would be the kind of monoculture practised in America and elsewhere which may be called soil mining rather than farming.

Question: Is it possible to produce good humus by methods other than those advocated?

Answer: Practice alone can decide. Well known methods are Sir Albert Howard's Indore process and the Adco process. The Indore method relies on control of conditions of moisture, air and temperature. The Adco process involves initially a reaction that seems to be primarily chemical; biological fermentation may occur later. There are various other processes.

Question: Does the material from which humus is made produce a difference in the quality of the plant to which it is applied?

Answer: This is not fully worked out, so we use a mixture. Certain things we know, for instance, tomatoes like tomato humus cabbages dislike cabbage humus.

Question: Were the preparations of the special plants named discovered by Steiner or had they been known earlier?

Answer: These preparations may have been known much earlier, but their application to composting seems to have been a remarkable intuition of Steiner's.

Sunday, July 2nd, 7.30.p.m.
LECTURE BY DR. PFEIFFER
THE SOIL A LIVING ORGANISM

Summary

We have seen that there is a very intensive life in the soil. In a cultivated soil there is usually a first layer of 1" or 2" which is crumbly, then a second layer of varying depth, often about 3", which is full of roots and other life. There may be a third and a fourth layer which are variable but less full of roots and life. The more or less dead subsoil occurs from 10" down to a much lower depth. The earthworm may go down to about 6'; clover roots may go even deeper if more than four years old.

A mineral applied to the soil is dissolved in the soil solution and distributed. If humus is present, this solution is absorbed in the upper layers; if not it is washed down to lower layers where it may be deposited at a definite level.

For example, it has been observed that spruce grown on a field used for grain for many years grew well for thirty years but when the roots reached the mineral pan the spruce grew sick and eventually died. If the pan is very deep it may not be harmful; it may occur anywhere from 2' to 45' down.

Lime is often deficient in soils overlying limestone which has been washed down through change of the humus structure. In the absence of lime humus formation is stopped and will not resume naturally owing to acidity of the surface. To add lime to such a soil is only a temporary measure and does not cure the trouble.

The amount of neutral colloidal humus in a soil is usually very small, only 5 to 1.5%; nevertheless it alone has the absorption quality necessary. Bio-dynamic compost and manure heaps have been found to contain ten times more of such humus than would ordinarily be found.

Crops are either humus consuming or humus maintaining. Humus consuming crops are the grain crops and brassicas: leguminous crops are

the maintaining crops.

For example, in the U. S. A., four or more grain crops are often grown consecutively. The only way to get a correct balance would be to substitute leguminous crops for some of these. Crop rotation has been neglected. Special study is required, not only in connection with farm crops, but also with perennial plants and fruit and forest trees.

We can learn much from forests. Monoculture, for example, of trees with shallow roots results in drying of the surface and a separation of the surface soil from lower layers. The soil soon ceases to conserve moisture. A forest ought to be a reservoir. In Southern U.S.A. the destruction of forests has had a very bad effect on neighbouring cultivated soils in little over twenty years. Similar situations can be found in Europe.

Shallow and deep rooting trees must be grown together. Otherwise soil structure is spoilt and the water level falls as it is now doing all over Europe.

The same applies to orchards. For instance, there are some healthy orange trees in Florida growing near other kinds of trees, though they are in a badly diseased district.

Therefore, we must pay attention above all to soil structure, the alternation of humus consuming and humus restoring crops and to crop rotation in space as well as in time.

In the soil frost and water produce a physical disintegration. Heat produces a chemical disintegration. Therefore, the treatment of the soil must differ in different climates. For instance, in Northern countries it is ideal to have a rough fallow in winter so that the frost may crumble the soil, but in South Italy a bare fallow would very quickly show signs of erosion. Thus observation and adaptation to conditions are essential in every case.

Very important to observe are the colour and feel of the soil and the roots of plants. We must study the collaboration between the roots and the soil in deciding on our cultivations.

An economist may say, for instance, that more than two harrowings are uneconomic, but there is a difference between biology and economics. The economist may fail to take into account long range effects. If you only want to go on for five years any kind of monoculture with any kind of chemical treatment is all right, but if you do so you may leave the place absolutely run down. If we want to carry on for hundreds of years at a time we must create farming dynasties, whose concern is the soil. Unfortunately the single individual is not yet conscious enough of the unity of his interest with the general interest.

The soil as a living organism is something far wider than its physical, chemical or humus structure. It presents a problem which needs and demands general human interest. The public must be educated to thinking in biological terms rather than thinking only in terms of money.

Discussion.

Question: What kind of fruit trees would you plant together so as to get deep and shallow rooted ones?

Answer: The question has been insufficiently investigated. Similarly the question of protective plants. Peach and pear trees do not like fir trees. Fir trees grow deep and apple trees shallow.

Question: Is not the planting system suggested exactly opposite to what is taught by Research Stations mainly because it is necessary to use poison sprays systematically over large areas?

Answer: Yes. The use of poison sprays is a sign that something is wrong. People think of it as a normal routine matter and do not regard it as being a sign of disease.

A Member: In Kent we used to grow all sorts of fruits together with bush fruit underneath and used large quantities of organic nitrogen manures. We found however that blackcurrants and certain fruits required more nitrogen but apples wanted more potash and suffered from leaf scorch. Therefore we now grow apples alone and the best plantations are undoubtedly monocultures. Nevertheless, in some apple plantations the humus situation is becoming critical. The question of vertical distribution of roots seems to be very difficult because excavation has shown that root systems are very extensive.

Dr. Pfeiffer agreed that bush fruits might not go with apples. He mentioned that rape, mustard and stinging nettles de-poison a soil easily and that it is much easier to demonstrate new ideas than to explain them.

A Member instanced a mixed orchard surrounded by various other trees which had been very little sprayed and was relatively healthy.

Dr. Pfeiffer emphasized the value of hedges and birds. A pair of singing birds with three off-spring collect 70 lbs of caterpillars. Poison sprays reduced the number of birds.

Dr. Eckstein said that where they used to use 12lbs of copper and lime spray in vineyards per year, the amount necessary was now 3 cwts, and that the same thing was happening in orchards. The more spray you use the more you have to use.

A Member pointed out that Rothamsted were trying to find a new poison for certain apple pests because the amount of arsenate of lead necessary had become dangerously high. He said that fence posts could be preserved by sprinkling arsenic on the soil around them. He suggested that orchard soils must be sterilized by arsenic spraying.

Dr. Pfeiffer said that the pasturing of cattle under the trees made such spraying impossible in Switzerland. He said that if young trees are planted with diseased older trees both die together, which indicates that it is the soil and not the trees which are at fault.

Question: Can you make trees sufficiently resistant to disease by the Bio-dynamic method to enable them to stand up to the troubles which your neighbour may be experiencing? Must not the method be applied over a very large area?

Answer: Results would be better over a very large area. Meanwhile we must have protective trees and hedges. Some discussion ensued on the effect of walnut trees in discouraging insects.

Question: Why do apples colour better if grass is allowed to grow under the trees?

Answer: This appears to be connected with the regulation of moisture and the absorption of excess nitrogen by the grass.

Monday, July 3rd, 7.30.p.m.
LECTURE BY DR. PFEIFFER.
THE FARM A BIOLOGICAL ORGANISM.

Summary:

The fundamental idea of the Bio-dynamic method is that we try to see all the conditions which in their collaboration and even in their opposite reactions form the soil as a unit, and to regard all these things as part or as organs of a single organism.

For example, in a pasture there are grasses, clovers and weeds. A farmer would merely wish to get rid of the weeds and would not think about their value, but these weeds belong: they are not necessary but they belong: they are significant and will tell something to us. For instance, the Swiss apply fresh liquid manure to their pastures. After a time the clover disappears and is replaced by buttercups and other wild plants. The pasture increases in acid more and more. These weeds then have a significance for us. They show that something is going on in an unbalanced direction. Similarly, wild daisies which are common in England grow only under very limited conditions of soil acidity, which happens to be acidity at which wild white clover disappears, so the wild daisy is an emergency signal showing that the balance of the pasture is changing in a dangerous direction; but tells us more than that.

Though the daisy grows on an acid soil it is extremely rich in calcium carbonate. The collection of lime by this plant tells us that the soil needs lime. If we study such effects a new field of nature is open to us.

For instance, tobacco is very rich in potassium on which its burning quality depends, so potassium fertiliser has been used on tobacco but the effect is very bad because the plant does the opposite of what you expect. It has a selective quality which I call its dynamic property. When in health it selects out of the soil such substances as are suitable to its organism.

Thus all plants form a balanced system with the soil which will not continue if disturbed.

So a farmer should watch his weeds. For instance, black nightshade grows on a soil on which a crust has formed and will indicate to him that something was wrong with the cultivation. Other plants grew where fresh manure has been used.

Therefore, I regard all these as being part of the organism of the farm. A farm is not only arable and pasture land, implements, cattle, etc., but all these things as well. This is most important.

Another kind of instance is that of cattle in relation to pasture. It is difficult to raise the fat content of milk, but if the cows eat the leaves of trees, and especially hazel, there is a good possibility of raising the fat content.

Another example, toads. There used to be a market in England for toads. When I heard this I wondered why they had a 'Toad Exchange' like a Corn Exchange, so various experiments were carried out with a toad. We found a definite effect on the soil of the enclosure where it was kept. The assimilation of plants growing on this soil was increased up to 30% in many experiments. In Jamaica toads are used regularly in sugarcane fields. In fact the toad is very rich in adrenalin. A single toad has four times as much as a human being. Adrenalin is a very active substance, so that we can say that toads really belong to the garden.

Last year I was at a farm in Maryland where seventeen compost heaps had been made. I was told that some heaps were prepared and some not. They were very interested in our system and said - "Can you tell us which heaps have been prepared and which not?" - I wondered how I could decide which had been prepared and which not. I observed a very peculiar thing. In about six of them here and there in the opening of the drainage toads were sitting. So I said to myself "Probably those toads like the B-D atmosphere better than the other", so I went along and said - "This heap and this heap and that heap". Our host grew pale and said - "By God how could you find that out?". I did not tell him till this year how I found out. In the meantime the seventeen heaps got offsprings up to about forty all properly prepared.

We ought to observe all the factors of life on the farm and try to make an ideal model of a balanced farm; then we should try to adjust every farm as far as possible to the ideal model though it may be difficult through climate, economic conditions etc.

In the ideal farm there must be a balance between arable, pasture and woodland. If there is not trouble may occur. For example, at Mecklenburg a swamp was reclaimed, with the result that the very fertile surrounding clay land produced 30% less crops. The dew has disappeared and there was not enough moisture. In Italy the Pontine marshes have been drained. In three or four years there are already signs of erosion and lack of moisture.

Somewhere in Switzerland a dam and power plant were built in a valley. You would not think that mattered, but the average temperature of the valley has dropped 3 to 5° F. because the water has been collected into one place and its energy exported as electricity. The drop of temperature has made a change of vegetation, So we see that a change in one fundamental part of the organism means a change of everything.

So balance is of first importance. In a treeless country orchards would help, but orchards only are insufficient. Pasture alone is a mis-balance. For example, a Swiss farmer had 36 acres of pasture and about 8-10 cows and no arable. He ruined the pasture with crude liquid manure. We advised him to plough up 6 acres. The B-d method failed on his manure heaps. after a year the preparations had not worked and they were still a slimy mess. But in the third year he had some litter from his arable and the manure improved. He used some of it on the pastures and they improved. He further increased his tilled land but is able to keep the same number of cows as before. He now says that he enjoys having cows though 5 years ago he was sad to have them because he had 70% abortion: but now each cow has a calf every year.

In some places there is no possibility of re-balancing entirely; then the question becomes how far can we go? If we stuck to teaching compost and manure making everybody would accept it after 5-10 years, but that alone is not sufficient.

An extreme example of monoculture might be a three acre farm in Milwaukee carrying 60 COWS in a three floor building with a lift. The Cows had 80% concentrated foods and a little hay and straw. The three acres were used for the bull. The resulting manure showed no decomposition after two years. The farmer asked how he could introduce the system on his farm and had to be told there was no possibility at all.

The limits of proper balance seem to be 40-60% pasture with 60-40% arable. A higher profit may be possible with a monoculture but it cannot last for long.

The former Agricultural Adviser to the Turkish Government was asked to make a report as to what conditions in farming were healthy and economical in the U.S.A. He found that the balanced farms were economically sound and paid their taxes while many others needed Government support. The Report has of course disappeared in the files and has never been heard of since. This adviser concluded that demonstration was the only thing, so he took a poor sandy farm in Florida. He started a diversified Bio-dynamic farm in the middle of the citrus district. There he has cattle and a mixed cultivation and has built up a self-supporting farm under very difficult conditions.

A biological organism can be developed on a small area. For example, six acres might be divided into two acres market garden, 2 pasture and a small plot of tilled land for corn and straw for cattle. Some of the market garden compost would go to the pasture and all manure to the market garden and arable. Such a place could be entirely self-supporting in manure and feeding and should enable the man to make a fair living.

Teaching is difficult, showing is easier. Every district should have at least some model place. In our days a man's brain is overloaded with knowledge but he does not know how to handle it. A student leaving the University is a text book. The great difference between schools and life is that schools teach by knowledge and life by mistakes, so a model farm must teach also the mistakes. Here we have seen 36 compost heaps, good and bad, and found out why some were good and others less good.

Single farmers cannot afford mistakes but the Government could afford to show, for instance, a field ploughed partly right and partly too deep or wet. Even now we could have a demonstration in Kent and say "Here we have a beautiful example of a monoculture which couldn't be done worse", but the owner would not like it.

Hops are grown in Kent and on the Continent. In Alsace and Germany with the length of the hops, fungus diseases are increasing. A member of the French B-d Association was employed to study this phenomenon. He went back to the beginning and found that hops are a forest plant and that diseases were started the further the hops were away from the woods. Hops need woodland humus. He tried it and got the first prize for French hops after two years' work.

Strawberries also grow in woods and like a compost of fir needles. They grow more upright, more healthy and more aromatic.

All the conditions of life, including soil, landscape, proportion of forest water etc. together belong to the organism. Our age has shown a development of specialised knowledge. In the future we must collect facts together and see how they work. Our system is called Bio-dynamic because it is based on knowledge of biological laws in nature and because we want to learn how they work together. Rudolf Steiner. our teacher called our attention to the study of one unit in particular, the human organism, so that from it we might learn how the whole of nature works together.

Discussion.

The question of broom rape on clover was discussed but no very definite conclusion emerged.

A Member called attention to a study of records of foot and mouth disease in Europe. The Ministry of Agriculture's map showed that outbreaks tended to diminish where old fashioned peasant cultivation was not disturbed.

Dr. Pfeiffer said that in Austria foot and mouth disease comes into the valleys but does not ascend

to the mountains where old fashioned systems without over-breeding prevail. Nearly all attacks occurred in cases of intensive breeding and high milk production. B-d farms could not avoid attacks but suffered relatively slightly.

A Member said that 80 years ago foot and mouth disease was welcomed by farmers in Northumberland because the cattle did so well after it.

Dr. Pfeiffer confirmed this.

Dr. Eckstein said that in Switzerland there is much concentrated feeding and foot and mouth disease is prevalent, but that it is less so in South Germany where there is little concentrated feeding. Also in Switzerland the cattle do not recover and milk production has greatly decreased, but that this was not so in Germany.

A Member gave an instance of cattle getting mastitis when receiving concentrated foods during the July flush of wild white clover and of their recovery when the concentrated ration was cut down and the cows moved on to more grassy pastures.

A Member gave some experiences of peasant farming in Nigeria, where the native farmer clears a patch of forest and grows crops without weeding. After a time he lets the land go back to bush and clears another part. Europeans had introduced weeding among other things which resulted in a leaching of the soil. There is no livestock, so green manuring was tried with little success. They are now concluding that the native system might after all be best. He added that on the Southern edge of the Sahara monoculture prevailed: at the same time the medical and veterinary departments had increased the span of life so there was an increasing demand on the soil. The desert was encroaching at the rate of 1 km. a year. A scheme for reforestation was opposed by the medical and veterinary departments who saw a mosquito and tsetse fly in every tree. He added that goats were the greatest curse in Africa.

A Member suggested that this might apply to loose goats but it would be a pity if the tethered goat were discouraged.

A Member asked whether there was wind erosion at the edge of the Sahara carrying sand on to cultivation. The reply was that it had occurred in French territory but not much in Nigeria.

A Member who had experience in Ceylon said that humus vanishes like snow in the tropics. He thought that the natives were losing their appreciation of the importance of preserving humus.

Question: In the suggested diversified farming, is it desirable to have a proportion of bare fallow; if so, how much?

Answer: Fallowing is valuable - probably up to 8 or 10%. There is a great difference between fallowing in the south and in the north. In the south one must work more with cover crops to avoid erosion.

A Member instanced a meadow continuously grazed by Cows which became overgrown with buttercups. About 15 years ago it had been planted with apples and grazed since then with pigs and sheep. The buttercups had been replaced by rye grass and wild white clover. He suggested that proper grazing made permanent pasture possible.

A Member said that in Denmark fallowing had been largely given up since 1850 except where the soil could not otherwise be kept free from weeds. On some of the stiff loam soils they fallow once every 8 years and bring manure on to the fallow and get a wonderful living soil.

Other members gave instances of good crops following fallows.

Tuesday, July 4th, 7.30.p.m.

LECTURE BY DR. SCOTT WILLIAMSON.

THE BIOLOGICAL REQUIREMENTS OF THE HUMAN ORGANISM.

Summary.

The scientist has pursued facts and truths in his own peculiar way which sometimes makes it difficult for him to find common ground with people who are intensely practical. You know Dr. Pfeiffer is a high representative of scientific or philosophical thinking applied to practical affairs.

Science is now evolving a new approach to things, which has come directly from the chaos of analytical science. The procedure of taking things to pieces, analysing them to the last ounce and then attempting to rebuild, and expecting them to function, has failed. Scientists are no longer satisfied.

Out of all this biology has emerged as a new science. Its axiom is that life itself is something to be studied and that the mechanistic view of life may not fit. Science however, is purely descriptive and in the course of description finds order; science does not explain anything. Life manifests itself in ways which are very different from the operation of anything mechanical.

The next thing is to find out what is the smallest unit which manifests all the characteristics of living things. After much research we now realise that the smallest unit of life is the mated pair with its progeny, that is the family. The individual cannot himself continue the race; he cannot diversify himself. The individual is not a biological unit.

In order to study the family, we must have a technique which is synthetic rather than analytical. The same must apply to the soil.

There are many difficulties. Unfortunately, the approach has had to be through the study of disease and of the various functional processes.

Thus a philosophical stamp of unutterable pessimism has been placed on all conclusions: to the effect that everything was born to suffer and we have to arrange for its protection. Hence the creature has appeared to be in a state of survival - done its best to shut out its surroundings and defend self. A surviving organism makes a minimum contribution to its environment. An organism which has got beyond the state of survival and that is exercising the primary function of health is reaching out to take from the environment everything that is new and to turn it to the mutual advantage of its actual environment.

If you look at me as a surviving organism it looks as if my life was cut up into cells each acting for its own survival. In fact, we as organisms are manifestations of something which is not contained within us but which is pervasive probably throughout the cosmos. So you cannot study the human organism without studying the cosmos itself. Similarly, it is not the biologist's job merely to pick up a plant and study it; that is the physiologist's job. A physiologist has kept an isolated heart beating for 23 years. But the biologist can only study it as something which is in cooperation with its actual environment.

I may have said enough to indicate that our attitude does not differ seriously from that of the Dornach school.

At Peckham we have stopped studying rats and rabbits and the amoeba. The actions of the amoeba are not distinctive. Man is simpler. We know when he is having a love affair - it is very different from when he is having a pint of beer. So we are driven to study the human organism in its environment to provide the quickest and best answers to our questions. Whole families attend at Peckham and do things. Unfortunately we find very few healthy. We found 16 individuals in the first 500 families and among them no more than 8 potential mothers who we could say were fit to begin pregnancy. We have no reason to suppose that the rest of Europe is any better.

We try to surround the human organism with chances: if it is healthy it will convert a chance into an opportunity; hence the swimming bath. Our observations indicate that ordinary people do not use their environment. That represents a gross

form of malnutrition. Only a part of their normal environment is their physical nutriment. We are only beginning to understand what malnutrition means. Our people are not very poor and do not mishandle their food. Therefore the 60% gross malnutrition found among the children must be due to the failure to utilise the food presented. The interference with utilisation is the most significant factor underlying the problem of nutrition.

You have been looking at the soil in the same sort of way. You can pour things into the soil but unless it is alive enough to use them they are of no use. The human organism in its social soil can be compared with the plant in its earth soil.

We try to prepare parents for parenthood. So we must know about their food. We took 35 acres of land to grow a dietary for this group. We had a shock. The first vegetables grown were more devitalised than the people themselves. The utilisation power of soil and plant was such that they could not use the richest supplies. So we had to begin again and are now trying to enliven this soil.

£77,000 have been spent in isolating Vitamin A but the truth is that pure vitamins don't seem to behave as they do in, say a lettuce. That is because digestion is not a simple chemical breaking down but is a personal affair; the food is broken down so as to suit the individual digesting it. The finest mechanism for extracting vitamins is the healthy body. Similarly we find that minerals must be in a living system before they are really valuable for digestion.

You may feel that this baby science - Biology - is moving in the same direction as yourselves. Its path may be different but ultimately it will come to the same conclusions as you practical men with your lively experience of things as they are.

Discussion

Question: Does pasteurized milk help in the fight against disease?

Answer: We prefer to use living milk at least for infants and pregnant women.
Actually

99.9% of milk is consumed after cooking.

Question: Is it generally better to eat vegetables uncooked, and is a higher percentage of raw food is desirable for children or pregnant women?

Answer: Only 7% of food consumed rebuilds the body. A much higher percentage of raw food is desirable for children and pregnant women. They must have living food.

A number of questions were asked about the Pioneer Health Centre. The replies given include the following points:

There ought to be no signs of pregnancy except an exuberant vitality. We are more and more using drugs instead of vital things. We have a pathological outlook on everything and seek to live comfortably and die peacefully. It is much easier to deal with pregnant women - provided we have not a grandmother at home - as their instincts are strong and sound; later on it is more difficult. Nothing less than a whole family is accepted for membership, otherwise they would simply take what we give them and digest it at home.

Dr. Pfeiffer stressed the importance of the unity of the individual and the environment. He had found that environment was a decisive factor in the breeding of cultivated plants. The environment of the plant includes the human being. Dr. Steiner said that we shall only understand the human being if we understand his environment to the outest limit. He suggested that health is the absolute harmony between the being and its environment.

Dr. Scott Williamson said that health is a faculty rather like seeing and hearing and like them is cultivable.

Dr. Pfeiffer said that we do know already that a fully diverse diet will educate the animal in the use of this faculty; so that it can absorb noxious material and convert it to good. We see in farming that if the organism is in harmony with the environment

which is in a diversified balance, then health is a result which starts by itself.

Some discussion ensued on the relation of poverty to malnutrition. Dr. Scott Williamson said that he found the same types of malnutrition in the wealthy as in the poor but that the poor sometimes showed starvation as well. He would deplore giving support to people to increase the birthrate while they are so unfit.

Question: If health is a faculty, is a healthy person conscious of his state? Surely if I am healthy I ought not to be conscious of the fact?

Answer: You are not really conscious of seeing but only of the picture on your brain. Sometimes people feel fit then we cure them of something and they come back and say "I didn't know how bad I was". Even of the 20% of people who know they have something wrong only 8% seek advice.

A member suggested that satisfaction with the physique of the militiamen was a tragedy. Dr. Scott Williamson pointed out that they do not publish the instructions given to medical officers. The standards of the Pioneer Health Centre were quite different.

Wednesday, July 5th,
1.30 p.m.

DISCUSSION ON TURNING OVER THE HOME FARM
BETTESHANGER TO THE BIO-DYNAMIC METHOD.

Lord Northbourne explained that it had been his intention to seek the advice of Dr. Pfeiffer on this matter in the course of the Conference and that it had been decided that it would be very useful if the discussion between himself and Dr. Pfeiffer were conducted before the Members of the Conference. For this purpose the following particulars of the farm were available:

Area in acres :- Arable 380, Permanent pasture 400, Orchards under grass 60, Total 840.

Rotation :-

1. Roots (with FYM or artificials, folded)
2. Barley (under-sown with clover & sainfoin)
3. Clover & Sainfoin (aftermath folded)
4. Wheat.
5. Barley or Oats (with 3 cwt. artificials)
6. Roots. (with FYM or artificials folded)
7. Wheat.
8. Barley or Oats (with 3cwt artificials)

plus 25 acres of lucerne (left for 5 years)

(In future, part of permanent pasture to be ploughed annually and replaced by temporary ley.)

Livestock :- Horses - 9. Cattle of all ages - 71. Sheep of all ages - 1450. Pigs of all ages - 120, Poultry- 1500

Labour :- Men - 27 regular, 4-6 casual. Women - 12 to 15 for fruit picking

Dr. Pfeiffer said that it would be necessary first to consider the acreages of various crops and to adjust their relative proportions. All the pasture could be regarded as temporary except about 80 acres of parkland on which trees made ploughing impracticable. The temporary pasture could all be considered as a reserve to the arable land. The proportion of pasture to arable was suitable for immediate application of the method.

21b

As regards the rotation, Lord Northbourne explained that many field boundaries were natural and that it might be convenient to consider units of approximately 40 acres in multiples of 8.

Dr. Pfeiffer explained that the first thing necessary was to consider how much manure was needed on the basis of the present proportion of arable to pasture. assuming an 8 course rotation and a root crop on sections 1 to 5 which would receive manure, it would be necessary to provide for 80 acres a year. The amount necessary for the rotation could be calculated with the use of figures available in standard text books on agriculture. The procedure was as follows:

The yield per acre of wheat could be taken as 1-1/2 tons: this would remove from the soil the following amounts (in lbs/acre) of :

Nitrogen	Phosphorus	Potash	Calcium
52	32	26	8

The root crop would remove: -

Nitrogen	Phosphorus	Potash	Calcium
90	72	135	7

A leguminous crop would remove: -

Nitrogen	Phosphorus	Potash	Calcium
0	29	52	48

A second corn crop would remove:

Nitrogen	Phosphorus	Potash	Calcium
50	30	25	8

The total requirements for four years were therefore:

Nitrogen	Phosphorus	Potash	Calcium
195	163	240	71

These figures correspond closely with those derived from experience under similar conditions all over the world.

A mixed FYM applied at 12 tons per acre would supply:

Nitrogen	Phosphorus	Potash	Calcium
190	250	215	63

There would be thus a deficiency of 7 lbs a year in Potash, and 2 lbs a year calcium, which deficiencies were practically negligible, especially in view of the fact that the classic experience on Broadbalk field at Rothamsted had shown that one third of the possible crop was, so to speak, maintained by nature without manure, and amounted to about 12 bushels of wheat per acre.

Therefore, looking at the matter from the chemical point of view it was clear that 12 tons of FYM per acre every four years could supply all necessary nutrients. The question really was the extent to which they were utilised by the crop. It must therefore be clear that the question of primary importance was the extent to which these materials were supplied in a form in which they could be absorbed by plants. This was only possible insofar as they were in colloidal organic form. If this could be ensured it would be safe to proceed on a basis of 12 tons FYM per acre every four years and not to worry about deficiencies. If crops declined it would mean, not that the supply of material was deficient and should be made up by artificials, but that the state of the soil was wrong.

On this basis the 80 acres to be manured every year would require 960 tons. The actual production of FYM on the farm was about 400 tons; in addition sheep were folded on the land. Sheep could be counted at the rate of ten per cow. A cow produces 10 tons of manure a year, a sheep about 1 ton. On an average 500 sheep were on the land for half the year: this could be assumed to produce 250 tons. The total FYM available could therefore be reckoned at 650 tons. This indicated a deficiency of 310 tons.

It was therefore either necessary to increase the FYM or alter the rotation: in other words 20 acres a year more ought to be manured: this was apart from the question of better use of pasture as it was evident that the growth available was not being fully used. As the extra amount required was so small Dr. Pfeiffer suggested that the best plan was to go straight for the production of that amount and an additional 31 cows would be sufficient.

If however 10 tons per acre of manure would suffice instead of 12, 160 tons could be saved and requirements could be met by 17 cows. He therefore suggested in practice an additional 20 cows or their equivalent in other livestock.

Taking into account the balance of livestock on the farm, cows would be best, and the difference should not be made up through sheep. He suggested that the increase of 20 cows was very necessary and would improve both pasture and arable land considerably. It would therefore be necessary to forego the profit on 20 cows

if they were retained instead of being sold as would normally have been done. Against this could be set the saving in artificials, normally purchased at about £200 a year. Therefore, the change to Bio-dynamic would be started without financial risk and without disturbing the present balance of the farm.

Haste in changing over was not advisable: it should be done only insofar as present possibilities allowed. He had not advised up to the present the investment of more money as present conditions were reasonably suitable. Considered economically the Bio-dynamic and other systems were equivalent in general.

The adoption of the Bio-dynamic system could not be justified by the expectation of any immediate financial improvement; it could however be abundantly justified in the improvement of the land and health of plants and animals and ultimately in the financial saving on the treatment and prevention of disease.

On this basis it was now desirable to proceed further and consider the necessary steps in more detail. It may be borne in mind that the figures given so far make allowances for the losses incurred in the conventional treatment of manure. With B-d treatment 10 tons per acre should suffice even now and 8 tons might do in future, but it would be well not to risk using the smaller amount at present.

We now come to the point at which some expenditure may be involved in respect of labour. One more man, skilled in the treatment of manure and compost, must be available. It could be assumed that the principal composting materials would be sheep manure from the lambing pen and chaff; together these should provide 75 tons which would cover half the gap in manurial requirements. The general idea should be to use compost on the pastures and try to get enough to use 3-8 tons per acre. When considering the rotation, all ploughable pastures would be regarded as temporary.

With regard to the care of pastures, it was clear that the farm pastures were too big for intensive use. Dr. Pfeiffer therefore suggested that the use of electric fencing for temporary divisions would enable a 12-15% improvement in the use of pastures to be made at once. This would be the only additional expenditure advised. Normally the compost would be applied in winter and must be properly harrowed in. This treatment should produce at least another 15% improvement and would eliminate the present slight acidity.

After two or three years other changes might be considered. Dr. Pfeiffer emphasized the value of short Leys and suggested that all land should be 8 years under crop and 4 years under ley. On this basis it would take 8 years to convert the whole farm to the Bd method. The cost would be the profit on 20 cattle, the wages of one man and the electric fencing.

As regards the question of feeding and of making the farm self-supporting, it was pointed out that at present about one third of the total amount fed to sheep and one sixth of the total amount fed to pigs and the whole amount fed to cattle was grown on the farm. Dr. Pfeiffer advised as a general rule the purchase of food rather than of fertiliser, during the period of compromise between conventional and B-d methods. It would be advisable to grow more leguminous crops probably by dropping a corn crop. Lord Northbourne alluded to the present practice of growing mixed crops containing beans for stock feeding and to the fact that subsidy was not obtainable on such crops. A member suggested that the Minister of Agriculture should be approached on this question.

Dr. Pfeiffer said that the question of self support in feeding stuffs must be approached gradually as means allow. A member raised the question of the relative cheapness of nitrogen in purchased and in home grown foods. Dr. Pfeiffer replied that overfeeding with nitrogen is the cause of much disease even of foot and mouth disease and contagious diseases in general. A decrease in nitrogen content of food would therefore assist towards an improvement of health, provided the food were properly grown. There was no doubt that the theoretical nitrogen ratio was unnecessarily high.

Lord Northbourne asked about the question of the supply of preparations for a large farm of 840 acres. Dr. Pfeiffer suggested that approximately one portion each of 500 and 501 must be allowed for per acre and 300 to 400 sets of 502 to 507. There was therefore no doubt that the preparations must eventually be produced on the farm and there must be somebody trained in the necessary technique. The actual work would not involve more than 2-3 weeks in the year and the total cost need not exceed £10 plus the cost of labour.

Wednesday, July 5th, 7.30.p.m.

LECTURE BY DR. ECKSTEIN.

THE HEALTH OF LIVESTOCK AND ITS DEPENDENCE ON
FEEDING AND SOIL.

Summary.

In judging a farm an expert in B-d methods will not first ask for a soil analysis, nor look at luxurious growth in fields, but he will look at the health of the livestock. If there is sterility, abortion, or other diseases, he will know that the biologic value of the farm is poor even though soil analysis and crop yields are good. Let us therefore consider some of the animals.

Wild horses are not adapted for pulling or riding. Their main forces for motion or fighting are in the fore part. Tamed horses have been bred for strength in the hind part. It is a law of biology that one part can only be strengthened at the expense of some other. In the horse the digestion and nervous system have been sacrificed to the forces of outer movement. Hence colics leading to inflammations in the blood and nerves, especially after feeding easily digested foods. Horses need food which does not easily release its warmth. Horse manure is hot because the animal consumes little heat. So horses are very sensitive to warmth from within and without.

Notice that we speak of the forces of warmth and light and not of atoms or photons. The latter will not help us in dealing with livestock.

In cattle muscular movement has been suppressed in favour of milk production; that is of the stimulation of the sexual glands which are closely connected with the sense and nervous system. The Greeks knew this and were careful that pregnant women should avoid repulsive impressions. The cow however looks inwardly; it is aware of its digestion and the activity of its sexual region. The stimulation has been achieved mainly by feeding the residues of oil containing seeds, from which the valuable part has been extracted so that they act as stimulants only.

The stimulation of the digestion and sexual glands impairs the functioning of the sexual system itself. Hence sterility and abortion which we cannot overcome with drugs and poisons while feeding in such a way. Moreover we deny the animal the stimulation of the sense system, natural to them, by often keeping them indoors for most of the year. Such animals are very liable to foot and mouth disease.

Wild pigs have very sharp senses. They live in the woods and are very active. The tamed pig has been bred so as to transform this activity into building up the body mass. So it requires much warmth and feeds naturally on parts of plants formed not by light but by warmth: the fruits and bulbs.

The pig can hold fast this warmth so its manure is cold. A pig which is denied the normal sense impression retains more warmth than he can use. It reappears in the skin as erysipelas or in the interior as swine fever. A German breeder who understood this went to extremes and kept his pigs entirely outside. He was very successful and has done much to overcome the fashion for concrete styes.

We can now see why horses need stems and seeds produced by the forces of light. On the plains plants grow long and thin rather than thick and juicy. The pig needs the opposite kind of food namely roots and bulbs. The warmth of these foods can be increased by cooking which is a kind of artificial continuation of ripening.

Cattle come in between horses and pigs. They need leaves which contain both light and warmth. It is very important that this kind of food should have had B-d treatment. If forced by artificial or unrotted manures they cannot absorb the forces of light, one result of which is that they lose aroma. In the absence of aroma the inner sense system of the cow becomes inactive. The feeding of cakes will stimulate the system but will overstrain it and weaken it for breeding. The calf will also be weak. Dr. Steiner suggested the feeding of calves on carrots and linseed. They must also have the colostrum milk.

A young organism must be supplied with active formative forces from the first. Neglect cannot be made up for later. On a certain B-d farm the average of 20 cows is about 3,500 quarts. The Cows get nothing but grass and hay and turnips and a little home grown barley in the winter.

You may think that these ideas are not new. They will be appreciated in this country where tradition is still honoured. But tradition must be made to fit in with the results of exact science. You can observe everywhere that the old methods are being given up under the strong influence of new scientifically tested records. And when modern Science announces, as you can read in the news papers as well as in agricultural magazines, that by feeding them synthetic urea, and even raw meat, the milk production and fat content are increased. many farmers will follow blindly these suggestions, at the cost of their livestock and eventually of their entire farm. Therefore it is necessary today to find new reasons for so many good old methods. These reasons can be found in the science of Bio-dynamic farming where we try to learn from the animal its needs and do not try to force them into a system of farming which can exist perhaps in the human brain but never in nature.

Discussion.

In reply to questions, Dr. Eckstein said that he did not think there need be any danger of cooking food for cattle. He thought however, that feeding lucerne alone was dangerous.

A Member remarked that Professor Stapledon had found it worthwhile, for the animal's health, to sow strips of weeds in rye grass and clover leys.

Question: Is it advantageous to keep calves in a paddock near the cow so that the cow can lick them?

Answer: Yes, the calf should not be separated from its mother too soon.

Question: Do you consider that the system of the modern horse is weak? Breeding averages are low.

Answer: Breeding difficulty is usually a sign of the weakening of the inner nervous system.

Dr Pfeiffer emphasized the good effects upon animal health which had been secured by converting a pasture farm into a mixed farm and feeding home grown foods. *He said that the pig was interesting as being nearest to man as regards feeding and digestion together with the rat.* Activity in searching for food was very important for the health of the pig. This kind of strengthening of the nervous system was a good cure for any human being or animal. Wood pasturing was good for the pigs and for the wood. Pigs need most food during pregnancy and shortly after, not just before slaughtering. We never consider sense reactions as important in feeding. For instance, a cow is very near-sighted but smells very intensely. Cows kept in a stable lose their perceptions and their discrimination in feeding

For instance, they will eat poisonous plants It might be worth giving them 1 cup of camomile tea. Camomile was useful in artificial feeding of bees.

Question: Would camomile take the place of the customary spoonful of whiskey added to sugar for bees?

Answer: (Dr.Pfeiffer) I do not know. You can even get a male turkey to sit on the eggs if you give him strong drink. When he gets sober again suddenly he gets up and says to himself "My God, what have I been doing this time?"

Several members made reference to cases of poisoning by yew. It was agreed that it was more dangerous when dry than when alive.

It was mentioned that salt to some extent neutralizes excessive forces of warmth.

Question: When should carrots be fed to calves?

Answer: As soon as they can eat, together with linseed because both have a strong force of light shown by upright growth and fine Leaves and stem. Such plants are needed by young animals.

Mention was made of the value of natural turf for pigs and of the importance of allowing cows a certain amount out of doors even in winter.

Thursday, July 6th, 7.30.p.m.
LECTURE BY DR. HEINZE.
GARDENING

Summary.

The task of gardening is to provide healthy food

If we were to read papers about gardening we usually find their advice is aimed at helping the gardener to earn money. It is sometimes necessary to earn money. For instance, in Holland we have to force our spinach to grow as quickly as possible to catch the market, we cannot ask ourselves what is the quality of such spinach. But we know that in a wet spring on highly nitrogenous pastures we get a disease of cattle from which they sometimes die. It is then clear that the balance in the plants is upset and the food is harmful to cattle. Men do not live on spinach alone so we do not get such disastrous results.

Similarly we know that unfermented manure applied to pastures can cause illness in cattle.

Fifteen years ago Dr. Steiner was laughed at for suggesting that human and animal health depended on healthy plants and a healthy soil, but we now know that he was right.

In the case of a particular disease of grapevines and of a disease of lettuce grown under glass and of the foot-rot of wheat or rye, official Research stations have found that the structure of the soil, if faulty, will cause the disease.

Until recently we thought that the way to deal & pest was to destroy the germs, but now we know that pests cannot attack a healthy plant. We have growing tomatoes, vines and cucumbers under glass for ten years without using poison sprays and without disease: but all other conditions must be as natural as possible besides the soil. Tomatoes need dry air, cucumbers a moist air. We had red spider on cucumbers which were kept too dry but when the proper conditions were restored the red spider disappeared.

We have seen this week that the best possible condition in the soil is found in old natural pasture. On soil in this condition even monoculture is possible for a few years. Under cultivation the soil gets harder and loses part of its humus: If we put organic matter straight into the soil it will eventually decay but will probably not ferment in such a way as to keep the soil in good condition. If we bury rather deeply organic rubbish which may have accumulated for years in a garden it will not help the plant and may cause disease. We can make it useful by rotting it down in the right way. The method of making a compost heap will be demonstrated tomorrow and Saturday. Instructions are also available in the "Practical Guide". It is usually best to put the resulting compost out in the spring and not to bury it too deeply.

But there are many other things to look after. Nature always provides a lot of different kinds of plants together. We can imitate her by making composts of different plants in mixture. We can water it with diluted chicken manure and if possible mix it in other animal manures. Later on we can learn a great many refinements and may make different composts for different purposes.

On a farm we have a rotation of crops. In a garden it is better to have mixed crops. It does not really cost more and is repaid by a bigger output. For instance, we now grow alternate rows of cabbage and field beans. The beans come off first and afterwards the cabbage cover the ground.

Another successful combination is one row each of peas, lettuce or spinach, cauliflower, lettuce or spinach and peas again. Such combinations are very effective in preventing the spread of disease. They help the soil and the plants and only require very little extra care.

Herbs are useful as companion plants. Lupins can be grown both for compost and soil improvement by their roots. Many other instances could be given if there were time.

Pfeiffer said: He had been asked what was the smallest useful size of garden. So an experiment had been made using very carefully produced humus and the principle of mixed crops. In addition they used a system of ridging land to increase the surface. In China a family of 12 often have to live on an acre with a goat, a donkey and some pigs. Our experimental piece was 5' x 15', we grew 5lbs spinach, 56 lbs red cabbage, 2 lbs lettuce 13 lbs celeriac, 3 lbs celery, 1lb lupin, 45 head of kohlrabi, and a second crop of 240 lettuce and 60 radishes. A garden specialist said that those crops would normally need 1/8th acre. Note: information has since been received that the second year of this experiment shows up to August only a still higher yield.

But the gardener's problem is often that of time. This use of mixed crops on a small surface actually much reduced the work. One crop shelters another and reduces the need for watering. In Autumn the ridges are flattened out and remade next year.

In any garden time is saved by having well-rotted compost on the land because it dries out less easily. Covering the soil with half rotten compost is also useful. In a garden near Paris they had last year only two showers from April to July. The garden was managed on the system advocated and they only had to water twice. The time spent in compost making is always more than saved in other ways.

The quality of vegetables depends on the kind of manure of compost applied. When you are cooking a cabbage you say the cabbage smells but I say the manure smells. It is the same with potatoes and many other things and means that unrotted manure has been used. This is very important in small private gardens where health matters most.

Herbs have a double value. They help digestion in various ways. The land often produces naturally the herbs necessary when it is overdone any kind of crop.

But herbs also help to keep pests off our plants. Such things as rosemary and lavender will help. If sage or rosemary is growing near our cabbage the white butterfly would go up and say "This really stinks to me", then he flies a few plants further and says "Horrible again", and then he might get weak and miss laying his egg on a cabbage.

There are not only plants which like one another but those which dislike one another, For instance, fennel and tomatoes, kohlrabi and tomatoes, cabbage and tomatoes.

All this probably looks difficult at first but once you have seen it, it does not seem so difficult.

Discussion

A Member said that his potatoes had grown badly where some chicken manure had been left lying.

Answer: Fresh manure should have chaff or something underneath it and the surface should be worked two or three times after removing it. Chicken manure is very strong and is best composted with something else. Lime will not neutralize it. It is useful diluted with water for moistening compost.

Question: Do you expect to get the same crop year after year from your small plot?

Answer: Only if all products not eaten were carefully composted and put back. In your gardens even a very little animal manure will help a lot.

A Member said that he had been running a B-d garden for five years and considered it very successful. He had succeeded in growing tomatoes and cucumbers in the same house and attributed his success to the quality of the compost.

A Member said his wallflowers planted near a herb bed had escaped fly which had cleared up other plants,

Question: Are there any small plants which will do as well as rosemary, lavender or sage?

Answer: Onions and carrots do well together, and the sprouts of tomatoes are useful. A tea might be made say of rosemary, also of oak bark finely powdered. In general any kind of aromatic and bitter herb would be protective. Nasturtiums round fruit trees protect against woolly aphids.

Question: Do herbs which help digestion help digestion of compost heaps?

Answer: Only in small amounts. In general they rot slowly.

Question: Would compost heaps made with the proprietary articles advertised be as good as those you are suggesting?

Answer: There is a big difference between chemical breakdown and fermentation. What we want is colloidal humus which can only be got by stimulating the earthworm. In the chemical heap there are no earthworms.

Question: Is there much value in rabbit manure?

Answer: It is all right in mixture. The more different kinds of material the better.

Question: Do you vary your composts according to soil?

Answer: No. A possible exception is roses for which clay in the heap might help. You should never use cabbage compost on cabbage. Nevertheless compost of tomatoes and couch grass is best for tomatoes.

Question: How do you avoid the danger of distributing weed seeds with the compost?

Answer: Seeds cannot stand 100-130 F. in a moist atmosphere. In turning over a heap, be careful to put the outside inside to kill surviving seeds. Experience shows that nearly all seeds are killed.

Question: Is peat moss harmful in composts?

Answer: Not in small amount. But if too much it makes the soil acid. It will not decay in clay so should not be used.

Question: Can compost be applied direct to the plant or down a seed drill?

Answer: Yes, but only if it is completely rotted.

Question: Would you advise an occasional green manuring?

Answer: There is always danger that it may not rot properly unless frosted before digging in. It is usually better composted. Half decayed greenstuff is a source of disease and takes away bacteria from the soil.

Question: Would animal urine or manure help to rot it?

Answer: If you cannot wait till it is frozen cattle may be used to trample it down and manure it.

Question: Should diseased potato tops be used for compost?

Answer: The same applies as to weed seeds. It should not be used before completely rotted.

Question: Will compost made in holes about 6' deep be useful? It is rather slimy.

Answer: Pits are only useful in hot and dry climates. I would not go more than one spade deep here. A wind protection of birch or elder or hazel is useful. Pits need special drainage and special inlets for the air.

A Member remarked that they had not been advised to buy anything but on the contrary had been advised not to buy the only purchasable article mentioned.

Friday, July 7th afternoon.

LECTURE BY DR. ECKSTEIN. THE HEALTH OF LIVESTOCK AND ITS
DEPENDENCE ON FEEDING AND SOIL.

(continued)

Summary

In the present state of farming we cannot achieve the ideal of perfect health, All conditions are not under control. So we continue to need animal remedies.

First there are general constitutional remedies. Our animals are said often to suffer from calcium deficiency even while lime is abundant. This is because only a healthy organism can regulate lime assimilation. But lime can be provided in a form in which the organism can take it up. Such lime is prepared through a living process. The *Weleda Lime Powder* is made from shells. There is also a homeopathic preparation of a mineral phosphate of lime. Both of these have been very successful especially with young animals. Cattle raised with lime powder have proved more resistant to foot and mouth disease.

Animals are simpler than men. One remedy will often do for various diseases. Such a remedy is *Coffea Preparata* which has a strong effect on all rhythmic processes. It has proved very useful with many different diseases, including foot and mouth disease, and the distemper of dogs. These two diseases are in a way similar in that it appears that the metabolic system and the nervous system have changed places. We have heard that contagious abortion and sterility can be reduced by reasonable treatment and feeding. In addition two ointments may be used which do not work as stimulants like the chemical remedies. Though very successful they may not be so if the farm is not managed on the B-d method.

A homeopathic preparation of sulphide of antimony is used for swine erysipelas. It is also used for fowl cholera.

Iron and phosphorus are known as remedies for human tuberculosis. They are even more effective with cattle.

Nevertheless the health of domestic animals the world over decreases from year to year. Diseases never before observed suddenly appear. The resistance of our animals has so far weakened that they are getting diseases hitherto peculiar to man. Therefore healing with remedies will have no permanent success while wrong treatment and faulty feeding continue. The B-d method of farming is in the end the best of all remedies.

Friday, July 7th, 7.30.p.m.
LECTURE BY DR. PFEIFFER.
THE FERTILITY OF THE EARTH, ITS PRESERVATION
AND RENEWAL
(with lantern slides)

Summary :

If a farmer wants to improve the fertility of his farm he thinks in terms of adding more fertiliser or of increasing his cattle and putting more manure back. If this fails he might decide to become a city man. But there are other questions besides manure which relate to the fertility of the farm.

There is a farm in Florida on which the soil is pure sand with a pond in the middle. This pond has provided enough moisture for the farmer to create a diversified farm with cattle and pasture and vegetables. There is similar land in the Sahara but no moisture. On the very fertile black prairie soils of America only prairie grass will grow because there is too much wind. So what we may call outer conditions are very important in determining fertility. Can we do anything in practice to improve these conditions?

Soil erosion has been much talked of lately. It means that the fertile surface soil is washed or blown away. You may think you have not got erosion but I am not so sure. It starts with the formation of a hard crust or soil pan produced by continuous cultivation and cropping and the intensive use of fertiliser. You can see the difference if you compare the soil of an old pasture with that of an arable field. Yesterday we saw a beautiful structure from an old pasture. That is what nature does. On the same farm we saw an arable field with two layers of hard pan. That is what man does.

Slides were then shown showing the influence of the landscape on the farm. The following points are selected from Dr. Pfeiffer's observations on the slides.

- It is a fundamental rule that the top of a hill with rock underneath must be covered by trees.
- To ensure the fertility of a large biological unit collaboration between farmers is essential.
- If a soil gets mineralized it cracks when dry and once this starts the effect is cumulative.
- Tractors often plough up and down the hill: this is a mistake. Horses usually plough along the this helps to stop washing down.
- When the winter furrow is washed down and filled it is a sign that soil structure is deteriorating. The best remedy is to get it back to pasture for a time.
- When it is too late to establish trees on the top of a hill re-forestation at the foot may help.
- We have to think in long terms - the longer the more advanced the state of deterioration.
- Rubbish ploughed in directly produces disease and an acid fermentation of the soil.
- The Pontine marshes in Italy have been drained and put under mechanised cultivation. After 5 years there are already eroded places as there is no wind protection.
- Anybody who cuts down a hedgerow or a wood in this country should be punished.
- An irregular broken up landscape was shown as indicating a living biological character, ideal for wind protection, water collection, and drainage. Such a landscape preserves the quality of humus.
- About 40% of the fertility of the land is due to regulation of the landscape, another 40% to cultivation and crop rotation, and only the remaining 20% is due to manure or nutriment supplied.
- Lately we have paid too much attention to chemistry. The natural law is that beauty, fertility and health are identical.
- The farm with its tilled land, pasture and forest is a biological unit; the landscape should also be such a unit. A diversified landscape controls and checks climatic conditions. We can now show that this is true.
- An American Professor wrote "In our days to claim that it is possible to grow healthy food or to have healthy cattle is absurd". But we have done both by application of biological laws and humus control.

Discussion

Question: Have the extensive excavations under the earth for coal etc. had an injurious effects

Answer: Very little yet known. But much is known about the bad influence of smoke especially on forests and bees. Also that the water supply to big cities is one of the greatest dangers to farming because there is a constant drop of water level. We are really living on the capital of water as well as of the soil in intensive farming. We shall have to study the question of other direct effects of the mining of minerals.

Question: Will the soil suffer from tar oil spraying in winter and arsenic in spring?

Answer: Literature has been published on this subject. Spray residue on the fruit is important. The legal maximum arsenic content for fruit exported from the U.S. has recently been raised to 300 times the amount fixed at the 1902 Convention. For export to France Canadian growers wash the fruit with acid, which spoils the appearance, So they then oil and polish it. In heavily sprayed vineyards we find a dead soil with greyish colour and very hard pan. When composted you cannot get fermentation unless exposed to the air for one or two winters. In South Germany bee keepers lost 6,000 hives from spraying of asparagus against fly. They brought an action against the asparagus growers.

A Member said that he thought that the smell of lime sulphur had kept the bees away from his orchard wherever it had been used.

Dr. Pfeiffer said that Swiss regulations were strict about spraying where animals were pastured. Fungus diseases were getting more resistant so new sprays were having to be devised. The question of constitution was fundamental. He instanced a case of the spraying of a forest from aeroplanes and the killing of all birds, part of the game, and five men.

Question: Would a plot, say of ryegrass and clover, gain more fertility if grazed than if it were not grazed?

Answer: If you over-graze or allow the sheep to puddle the soil it will do more harm than good. Judicious grazing would be good.

In re-claiming land the main expense is clearing rubbish. Burning is simple but the resulting soil soon loses humus. Sheep have been used cheaply and effectively but they are slow. Either capital or time must be expended. If a farm has been abandoned as tilled land the situation is much worse than if abandoned with a soil cover.

Question: Could Dr. Pfeiffer give his impressions of the state of the soil in this part of the country and of the principal dangers to which we may be exposed?

Answer: Only with full responsibility as to places actually visited. The land on this farm could be more intensively used. The soil is not in bad health but needs short leys and more cattle. Generally the situation in England seems favourable. There are trees and hedges and the conditions given by nature and history are all right. You should keep these conditions and could use the land more intensively. In many places there is too much grass and the balance of arable and pasture should be restored. In places reforestation is wanted. Against acidity there is only one cure - aeration and leguminous crops.

Question: Would any objection to the use of artificial fertiliser be removed by ploughing in the crop to which it was applied?

Answer: We could talk about that for a fortnight! and would need a J.P. to calm us down. We must look at this problem in terms of a long period. We are proud that our corn crops are double those of 75 years ago. But we are using 3 or 4 times as much nitrogen to get this doubled crop.

The organic state of the land is the primary consideration so I would always buy feeding stuffs rather than fertilisers.

My book recommending the organic way of farming and saying that mineral fertilisers are not necessary, was backed by a prominent American chemical magnate. When he was asked why he said he believed the organic state of the soil to be primary. If that was restored they might still have a market for top dressings. We have worked farms ten and fifteen years on the B-d method and no soil deficiencies can be shown. This has been confirmed by official Agricultural Experimental Stations.

Question: Can we cut down the amount of feeding stuff purchased and really make our farm self supporting?

Answer: We have seen that it would be possible on this farm by more intensive use of the land and twenty more cattle. It depends on a qualitative improvement of crops. It may take some years to achieve.

As this was the last lecture Lord Lymington eloquently expressed the thanks of all present to those responsible for the Course.

Saturday, July 8th, 9.30.a.m.

DISCUSSION

ON THE ECONOMICS OF B-D FARMING AND OF RESULTS ON ESTABLISHED FARMS.

Dr Pfeiffer said that we had seen some nice heaps and it must be obvious to the farmer that labour was involved in that preparation. He must therefore ask himself 'Does B-d farming pay?! This however was not a fair question. Financial profit depends chiefly on management; it must be possible however for a farmer to make a living under any conditions: if he were shipwrecked on a small island he would have to make his living. The answer to the question therefore depends on which aspect is involved. Another reason for difficulty is that prices depend on outside circumstances: such prices are not a measure of what is really necessary. Therefore the farmer's first task is to be independent of outside circumstances. Our discussions have dealt with how to bring this about. If the farm is self-contained, however few cash crops it produces and whatever their price, the farm pays.

The farmer has to decide what kind of farm he will have according to circumstances, but his main decision must be what is to be the main cash crop. Once the type of farming is decided the question becomes 'If I introduce the B-d system what will be the advantage?' This can best be answered by taking examples.

If ranching were decided upon, all manure would go direct to the land, there would be no intensive farming. The application of the B-d method would be confined to preparations 500 and 501 and small amounts of compost; a little additional labour might be involved. The advantage would be only a better chance of feeding in dry weather. This course represents a minimum advantage from the system.

If dairy farming were decided on there would be two types, first with cattle indoors part of the time and second with cattle out all the time. The second has the disadvantage that less manure is collected and the winter manure is wasted. There is also soil damage in winter. Such systems should be changed in

direction of indoor feeding in winter; the additional cost is small if a stable is available. Such farms often have no implements - the possibility of change depends on the capital position. They also suffer from abortion and mastitis: the additional cost of feeding will be paid for in avoidance of such losses. In Switzerland excellent results have been achieved by such changes.

If the farm were to be an ordinary diversified farm, the considerations necessary have already been dealt in the discussion of the change-over of Betteshanger Farm.

If it were already a very intensive farm employing a large amount of labour, no additional labour would probably be necessary. Probably a change to a less intensive rotation might make it possible to save a man or two for the special work of the B-d method.

Dr Pfeiffer then gave a selection of figures relating to results on established farms abroad, particularly to fields of crops and stock and reduction of disease. Most of these figures are available in Dr. Pfeiffer's book or other publications of the B-d Association. He explained that although increases of yield had been commonly shown, such increases were not claimed as the important results of the method. The lesson was that if the method were well managed, quantitative results would come of themselves. The policy of the Association was to try to intensify the consciousness of the need for health in the soil and in the creature. Once that was achieved any consequent increases in yield were a very pleasant addition for the farmer.

Dr. Pfeiffer also gave instances in which the special methods advocated had not been successful at first owing to serious faults in ordinary farm management. He then dealt with the question of what to look for in visiting a farm. The whole truth was rarely revealed by the farmer at first. He had once visited a very modern farm with all possible technical equipment. The farmer had claimed that his cattle were the most beautiful in the country. A veterinary surgeon, who was incidentally interested in B-d, was present, and had given Dr. Pfeiffer a nudge and whispered to him "This is my best client". So an adviser or critic must be able to discover for himself, then he will get the confidence of the farmer. For instance, the smell of the stable and the number of calves are important. The smell is different where abortion is present, and you often see 20 cows and only 6 calves. Members had seen the process of soil scratching

and examination of pasture. Patches in fields stimulated by accidental droppings of manure indicated that the field was run down. All these matters were strictly related to the economics of the farm. Usual advice as regards compost etc. was a small part of the advice given: the management of the farm is far more important. The Information Centres were able to give advice on this.

It was pointed out that whatever might be the financial economics of farming in Switzerland, as a whole there in the country 980,000 COWS and only 300,000 calves. When something was so obviously wrong with breeding it was nonsense to talk about economics without taking that situation into account. Other instances were given in support of this contention. The conclusion was that the B-d system in itself is not essentially economic: farm management is essentially economic. Experience showed that every soil had an average crop and an optimum crop; after a time B-d farms arrived somewhere between the average and the optimum. If they failed to arrive at that point, the management has to be investigated. For example, wet ploughing can cause up to a 20% drop in the yield. Usually the general improvement is of the order of 10-15% which is more than sufficient to pay for the small extra costs involved. There could therefore be no economic objection to B-d. The B-d farmer would meet with certain difficulties from his neighbours, especially if he was not absolutely certain what to do. It was therefore essential for him to be independent-minded: improvement often meant doing the opposite of what you were used to doing. In cases where the method had been started ten years ago, as in Holland, neighbouring farmers were just beginning to ask "What are you doing?"

A member pointed out that the idea of insulating yourself from outside markets pointed to the maximum diversification within the farm. Such insulation was now necessary, though ultimately selling in any market must be the ideal. The existence of soil erosion was due entirely to economic conditions, the farmer had been compelled to go in for soil exploitation. The extent to which a farmer avoids monoculture may be the extent to which he escapes from the influence of the market.

Dr. Pfeiffer said that a cash crop was necessary but it was best to try for a local market. Only so could we achieve a social system in which the Doctor, the clothier etc. are part of the self-supporting system. That was why we started with manure treatment and then went on to the improvement in the general condition of the land of a country. The next step would be the improvement of the social model of the country

The actual proof could only be given by demonstration. He alluded to certain interesting experiments which had been made in America and to a Japanese colonisation scheme in which the whole model had been built up in Japan before transfer to South America.

He said that conditions were promising in Switzerland and South Germany where there were few big cities but many villages with small industries in them. He gave an example of a factory which had reduced hours in the summer so that people could work in their gardens. This could be regarded as a really sound unemployment insurance. This factory bought land and let it to the workers instead of investing in shares or gold. The factory also ran a small demonstration farm. It received a steady 2-3% on its invested capital.

Members called attention to a number of other experimental colonies in England and abroad. Dr. Pfeiffer pointed out that the 500 acres at Loverendale were supporting 400 families in food. He emphasized the need for de-centralisation and instanced a modern telephone exchange which worked although no individual could grasp the mechanism of more than 200 connections.

A member alluded to a modern calculating machine which worked admirably, but the firm had engaged a highly paid man to find out why and what it could do.

A member said that the political and social moral of the B-d method was de-centralisation to match the diversification of nature. Capitalism proposed reform by exactly the opposite method.

Dr. Pfeiffer said that "isms" are always working with abstract systems: socialism especially was not connected with the land. Opposition to B-d was met with particular in socialist news papers and those sponsored by the chemical industry. The differences between the principal modern "isms" had been expressed as follows:

Suppose a man has two cows – if he is a Socialist he gives one cow to his neighbour; if he is a Communist he gives one cow to the Government; if he is a Fascist he keeps both cows but gives the milk to the Government which sells part of the milk back to him; if he is a new dealist he kills one COW, milks the other and pours the milk down the drain. He suggested that a believer in BD should have the use of both cows and milk and invite someone else to share with him.

In reply to a question Dr Pfeiffer said there was a B-d Association for Soil and Crop Improvement founded nearly every country to give information by letter and visit, to represent ideas to the public and to Governments, to establish Information Centres for the surrounding country. Some of these Information Centres were by now self supporting. Literature was published in various languages. There was now a half yearly News Sheet in England. It was not a profit-making movement but was dependent on free recognition only. The price of preparations covered expenses only; the main centre was at Dornach.

He explained further that there was another branch of the Association in this country which differed in some degree as to the mode of representation of the basic ideas. The basic ideas were however in both cases the same.

A member asked whether there was a farm or institution where training was possible. Dr. Pfeiffer said there was Loverendale in Holland, some small farms in Switzerland and one proposed centre in France. There were several places in Germany, but the situation there was difficult as regards the employment of foreigners.

A member asked how much land was now being worked on the method and for how long it had been established. Dr. Pfeiffer said that there was about 2,000 farms and gardens, not including back-yards amounting probably to over 50,000 acres. There were about 100 farms and gardens more than ten years old. In Germany there were 1,200 enterprises, 500 of them more than five years old. In Switzerland about 60 enterprises and 320 members of the Association. There was not yet a properly established farm school. In England there were 160 members, in America 120, some of whom were running big farms. One enterprise consisted of 10,000 acres of forest.

On a question as to conditions of membership, it was that all particulars could be obtained from advisory centres and that advice and preparations were available to all. The reason for such restrictions were that the reputation of the B-d method must be maintained and the name must not be misused, commercially or otherwise. In Germany the word "Demeter" was a registered trade mark, but owing to present regulations, its use could not be extended to other countries easily. Dr Pfeiffer said that it would be necessary that the initiative in regard to any rules or trade-marks in this country must come from this country

Dr Eckstein said that he had been working with small farmers and had found the psychological effect very favourable; in particular they had stopped chasing the market although they had been advised to do so officially; in fact the small farmer was rarely successful in such operations.

Sunday morning, July 9th.
SUMMARY OF PROCEEDINGS.

The three members of the staff were invited to give their views generally and to say what they considered the outcome of the Conference.

Dr. Pfeiffer first expressed his thanks to all responsible for the organisation. He said that it was necessary to look both backwards and forwards. He had appreciated very much the amount of time given to practical demonstration and thought that in the future there might be the possibility of a meeting devoting much time to this. There was really a very great deal still to be considered, for instance, seed mixtures, seed breeding, animal breeding and selection, demonstration of cultural operations. What was really needed was a sort of India-rubber time. He would also like some evenings to be devoted to the development of more general problems.

Dr. Eckstein joined in expressing his satisfaction. He regarded the Conference as the beginning of work for the future; so far the outlines only had been explained. The real purpose of advice on B-d lines was not that of dealing with particular problems but of teaching the farmer to look at his farm as a whole so that he developed insight. He was pleased to find natural conditions here good; there was every opportunity to avoid the false way in which ever more and more difficulty would be met with. Dr. Heinze supported the two previous speakers. He said that he would particularly like to go into the question of rotation and cropping in relation to markets.

Lord Northbourne expressed his thanks to the staff for their unremitting attention and able exposition, also to all Members of the Conference, whose friendly collaboration had made the running of it so easy.

Mr Mark expressed the thanks of the Members to all who had been mentioned so far and in addition especially to Mr Butchart and Mr. and Mrs. Peters.

Lord Northbourne then suggested that they should proceed to try to clear up any problems which might be outstanding in members' minds. Miss Cross said that what could be generally described as the labour problem still remained. Dr. Pfeiffer said that there were a certain number of real farmers in the world and that that number does not tend to increase but people were beginning to be tired of the cities. He suggested that the only value of cities was that people got tired of them.

Nevertheless, getting back to the land had been very unsuccessful: so a good idea had been spoilt. There was the necessity for a re-acclimatisation to nature and therefore first of a sorting out of true farmers by some sort of mental and moral examination, including very hard labour from spring to autumn. The essential factor in the future of bio-dynamics is re-education. To some extent the so-called advantages of civilisation must be foregone, with the object of forming nuclei, of which this meeting might be a starting point. Demonstration farms were also necessary. Mr. Butchart said that the potential country population now in cities was becoming actual from the strength of these people's desire towards the land. He suggested that they did not require examination, the very difficulty of getting on to the land was sufficient to weed out the unfit.

Mr. Stansby said that though he was not actively engaged in Agriculture, when in Ceylon he had tried to introduce the Indore method and the response of the natives had been remarkable. He did not think much of officialdom because anything could be suppressed by the writing of memoranda.

Mr. Rasmussen expressed his appreciation of all that had been done: he said that though he had been practising for some time he had learnt a lot of new things. He said we had made 8 or 9 days out of a week and he wished it could have been 14.

Lord Northbourne said that his present feeling was that whatever happened now he felt he knew what to get on with. There was really something to do which was quite independent of propaganda and theoretical disagreements and which was nothing to do with advertising in the ordinary sense.

Dr. Pfeiffer suggested that after 20 years we might be justified in publishing all our figures but that by then they would not be necessary. With regard to advertising he had found

that articles written against the B-d method were most effective and that it might safely be left to the other side. There were still things to criticise about B-d farming which only served to show how difficult it was to achieve completeness. The difficulty of responsible labour was one of the most important. He suggested that we must be open and frank about such difficulties and confine ourselves to showing and talking about facts.

Mr. Mark suggested that the Association had a responsibility towards people interested and should therefore not be afraid to talk. He feared the effects of a demand for quick production which might put the principles advocated into abeyance. People were probably going to be brought on to the land within the next few years whether they liked it or not. Therefore we should not be afraid to cast our bread upon the waters.

Lord Northbourne said that he felt that what all would like to know would be how soon and under what conditions they could get Dr. Pfeiffer back to this country.

Mr. Cameron said that Dr. Pfeiffer's visit to Dorset for only one evening last October has resulted in much interest in organic farming generally.

Dr. Pfeiffer said that he could not make plans for next summer: he might be in England in October. He suggested that a meeting in winter might enable local farmers to attend regularly. It would be necessary to concentrate much on livestock and rotation plans. He would like everybody to think about this question and to make proposals.

Miss Cross, in the absence of the Acting Secretary of the B-d Association, expressed the thanks of the Association for all that had been done to promote their work.