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Medical "Testament" on Nutrition

From Sir Albert Howard

SIR,

-- MY attention has been drawn to Dr. R. R. Bomford's letter in your issue of May 13, in which he asks for evidence for the view that the nutritive value of vegetables and other crops depends on humus prepared from vegetable and animal wastes. This is set out in two documents --

1. references appended to the Medical Testament, a closely printed pamphlet of 28 pages,
2. and the proceedings of the public meeting held at Crewe on March 22 last at which the Testament was unanimously adopted.

This latter paper appeared in the *New English Weekly* of April 6, the reprints of which ran to another 25 pages of print. Had Dr. Bomford been able to study these documents I feel sure his letter would not have been written.

No mysticism is needed to prove that crops grown in soil manured with humus contain a factor or factors necessary for animal nutrition which are often absent when artificial manures are used. It is only necessary to feed such crops to animals or human beings and to observe the results. Two recent examples of such experiments will suffice.

At Marden Park in Surrey, Sir Bernard Greenwell has found that a change over to a ration of fresh home-grown food (raised on soil manured with humus) fed to poultry and pigs has been followed by three important results:

1. the infantile mortality has to all intents and purposes disappeared;
2. the general health and well-being of the livestock has markedly improved;
3. a reduction of about 10 per cent. in the ration has been obtained because such home-grown produce possesses an extra satisfying power.

At a large preparatory school near London, at which both boarders and day boys are educated, the change over from vegetables grown with artificial manures to produce grown on the same land with Indore compost has been accompanied by results of considerable interest to parents and to the medical profession. Formerly, in the days when artificials were used, cases of colds, measles, and scarlet fever used to run through the school. Now they tend to be confined to the single case imported from outside. Further, the taste and quality of the vegetables have definitely improved since they were raised with humus.

How does humus affect the quality and nutritive power of a crop? The mycorrhizal association in the active roots provides the clue. Living threads of fungous tissue pass from the humus in the soil into the active roots and are digested there. This happens in

practically all crops and explains why a fertile soil produces crops resistant to disease and of high nutritive value. The plant feeds in two ways:

1. by means of the carbohydrates and proteins synthesized in the green leaf by the energy of sunlight, in which process the salts, absorbed in dilute solution from the soil, play an essential part, and
2. by the direct digestion of fungous tissue in the cells of the active portion of the surface roots.

Artificial manures only influence the work of the leaf, and therefore only partially feed the plant. Humus influences both the leaf and the mycorrhizal association, and is therefore a complete and balanced plant food. This explains why crops raised with artificials are so liable to disease and so deficient in quality and satisfying power, and why crops raised on humus resist disease and provide real nourishment for the animal.

A great deal of work on the effect of humus on the crop, on the animal and on mankind has been in progress all over the world since the *Waste Products of Agriculture* -- in which the scientific principles underlying the Indore process are set out -- was published by the Oxford University Press in 1931. The results are everywhere the same. A fertile soil leads to healthy crops, healthy animals, and last, but not least, to healthy human beings. Each centre which adopts the Indore process becomes a focus for the revolution in agriculture which is now proceeding. The results are being written, not in the transactions of the learned societies but on the land itself. The rapid progress that is being made depends not on mysticism or on special pleading, but on the one unanswerable argument -- success.

-- I am, etc.,
ALBERT HOWARD
Blackheath, S.E., May 17.

From Dr Lionel Picton

SIR, -- After the unanimity of acceptance with which the Cheshire Testament has been received the criticism of our views in the courteous letter from Dr Richard Bomford of New York was stimulating. The question is whether the cycle

Animal &
Vegetable —> Soil —> Plant —> Food {Animal —>} Man
Waste

is essential to health or whether, as Dr. Bomford suggests, a solution of chemicals might be substituted for the first two items. To grow food crops in nutrient solutions might, he thinks, be of the utmost importance in rapid expansion of food production in an emergency; but that if, as Sir Albert Howard holds -- and we who accept his teaching -- organic manure of both animal and vegetable origin be an essential link in the cycle, this hope is illusory. But, he continues, it is for the committee to bring forward more evidence for their views than is contained in the Cheshire Testament. Well, Sir, we have done so.

With the Testament, as issued in Cheshire, a body of references was circulated, a twenty-eight-page document substantiating all our statements. "Out of the earth," says Sir Robert McCarrison, "are we and the plants and animals that feed us created and made, and to the earth we must return the things whereof we are made if it is to yield again foods of a quality suited to our needs." We quoted that wonderful book by Dr. Bomford's countryman, Professor King, published incomplete and posthumously, *Farmers of Forty Centuries*, which is a mass of information on the way the Chinese for 4,000 years have organized the composting of all vegetable, animal, and human wastes, and after their most skilful preparation the return a the soil at the optimum moment of the resultant fertiliser. It is this system which alone has made possible their 500 million serf-supported population. And we quoted Viscount Lymington's remark that the book "should have made all Western doctors and biological scientists re-think and re-value everything they ever thought or dreamt." We quoted Sir Albert Howard's note on the effect of the composted town wastes of Nairobi -- "the results obtained on controlled experimental plots of flowers, vegetables, maize, grassland, and coffee have been amazing." The sales of the compost already in 1934 were 3,400 tons at 14s. We quoted Mr. Haynes, the manager of the Bodiam hop garden of Messrs. Arthur Guinness and Son, that on their 500 acres he uses 10,000 tons a year of a compost of ashbin refuse, hop bines, string, etc. We quoted Captain Wilson of Surfleet as giving up chemical manure for compost, and saying that formerly his potato crop was sprayed four or five times and now it is only sprayed once, and this, it is hoped, will also be dispensed with before many years, when the land has become healthy and in a proper state of fertility.

A day or two ago I said to a farmer, "Tom, what about this -- manure for the potatoes?" [The dash is not an expletive, but the name of a firm of chemical manufacturers.] "Oh," he said, "we mun use it. Our customers won't look at little uns and we've got to have the weight; but" -- here he smiled slyly -- "we allus set two drills for ourselves wi'out it."

To return to our references, one of many would alone carry conviction -- about Sir Albert Howard's oxen at Indore. Fed on the product of his 300-acre farm, entirely manured with compost, they never took the foot-and-mouth disease or the rinderpest, "which frequently devastated the countryside." Sir Albert told me he had seen his animals rubbing noses with his neighbours' cattle, which at the time were streaming with foot-and mouth disease. Yet nothing happened: his beasts were immune! Finally we pointed to the explanation given by Sir Albert Howard of the effect of the compost: not only does it recreate the crumb structure of the soil and furnish the soil population with food -- that population includes earthworms which aerate the soil, and which chemical fertilizers drive away -- but it (compost) "is essential for the full activity of the mycorrhiza." It is because of that, to answer Dr. Bomford, that you can not beneficially interfere with the natural cycle by chemical means. In the presence of "inorganics" the mycorrhiza (the root-investing fungi which act as the intermediary between the humus and the plant, their mycelial threads actually entering the root-hairs and being therein digested) disappear!

"When plants like French beans are grown on poor soil by means of artificial manure the produce is tasteless and of poor quality. For real taste and quality it is necessary to use humus made from vegetable and animal wastes or farmyard manure.

A supply of combined nitrogen appears to reach the plant by way of the nodules [the nitrifying nodules on the root-hairs of the Leguminosae] and root-hairs; and materials which are needed for quality appear to be absorbed by the mycorrhiza . . . The mycorrhizal association occurs in most if not all our crops -- cereals, fruit trees, grasses and clovers, hops, strawberries, vines, bulbs, and so forth -- and it at once explains why farmyard manure gives better results than artificials. . ."

Dr. Bomford invites us to refrain from taking sides in this matter. We cannot refrain. It is a primary concern of preventive medicine. The water-culture of tomatoes -- and tomatoes are one of the few food crops in which the mycorrhizal association has not so far been found, I am told -- may, as Templeman and Watson say, "always be of academic interest"; but that should not deflect attention from the great national problem of dwindling soil fertility and of the present ignorance -- terrible in view of the need -- of the means of restoring it by town wastes. Southwark alone seems to be alive to their value, and sold last year £2,715 worth of ashbin rubbish for composting. Should any still feel that the value of humus-grown food for human beings is in doubt a perusal of Dr. Wrench's *Wheel of Health* would be convincing.

-- I am, etc.,
LIONEL JAS. PICTON.
Holmes Chapel, May 14.