

Making Health Infectious: From Organic Principles to Whole Health Agriculture

Creating and Managing Positive Health

Generally health is seen in terms of absence of disease rather than as the existence of a positive state or dynamic. There is an alternative view, notably promulgated by the Peckham Experiment or rather the Pioneer Health Centre (*Scott Williamson and Pearse 1980*) that there is such a thing as positive health which is an active process; it has its own pattern of behaviour and can be as infectious as disease. This thinking led to the idea that the health of soil plant, animal, man and planet is one and indivisible, which provides a conceptual basis for organic food and farming.

However, few farmers – organic or conventional – farm for health; knowledge and understanding about how to manage a farm for health is limited, as is how to it can be made to be infectious and how it can be transmitted. We can experience some farms or crops or animals where there is a sense that “health smacks you in the face” but why that is or why others don’t is largely unknown.

What is known is that organic agriculture is the only farming system consciously built on a concept of health (*IFOAM 2005*). Whatever their merits, approaches such as agro-ecology, “agricology”, precision farming, low-input farming, regenerative farming, pasture-fed farming or any of the other buzzword farming approaches, are not conceptually or systemically build around health in the way organic farming is – and certainly not for as long.

There are clear differences, favouring organic, between organic and other farming systems in a range of “beneficial parameters” of food quality (*FiBL and ORC 2015*). But apart from pesticide residues these differences are not as great as organic protagonists would like. Moreover they are statistically and visibly variable.

It is clear that soil, farm type, season and major management differences in such things as rotations, cultivations, variety selection, manure and other input management, stocking rates etc are significant factors in this variability. What is unknown is how, why and if these factors affect the process of positive health and its transmission?

Organic Farming is based upon a concept of health

The genesis of organic agriculture is arguably found in three schools of thought, which originated in the first three decades of the twentieth century. These are: the Biodynamic or anthroposophical school of Steiner; the Organic-Biological school of Muller and Rusch; and the Organic school of Howard and Balfour. Also important is the work of Schuphan and



Voisin who promulgated the idea of the “biological value” of soil, plant and food in the early 1960s. (*Woodward 2002*)

There are some highly significant differences between them. For example the anthroposophical perception of “ethereal and astral forces” is unique to the biodynamic school. However, there is an essential core of agreement which three aspects;

- 1) The concept of the farm as a living organism, tending towards a closed system in respect to nutrient flows but responsive and adapted to its own environment.
- 2) The concept of soil fertility through a “living soil” which has the capacity to influence and transmit health through the food chain to plants, animals and Man. And that this can be enhanced over time.
- 3) The notion that these linkages constitute a whole system within which there is a dynamic yet to be understood.

These core agreements form the underpinning of the Principles of Organic Agriculture as set out by the International Federation of Organic Agriculture Movements (*IFOAM 2005*) – the principles of Health, Ecology, Care and Fairness.

Although they are all linked together it is the first two which are most relevant to this discussion:

The organic principle of health declares that “the health of individuals and communities cannot be separated from the health of ecosystems - healthy soils produce healthy crops that foster the health of animals and people. Health is the wholeness and integrity of living systems. It is not simply the absence of illness, but the maintenance of physical, mental, social and ecological well-being. Immunity, resilience and regeneration are key characteristics of health.”

The role of organic agriculture, whether in farming, processing, distribution, or consumption, is to sustain and enhance the health of ecosystems and organisms from the smallest in the soil to human beings. In particular, organic agriculture is intended to produce high quality, nutritious food that contributes to preventive health care and well-being. In view of this, it should avoid the use of fertilizers, pesticides, animal drugs and food additives that may have adverse health effects.”

The organic principle of ecology “roots organic agriculture within living ecological systems. It states that production is to be based on ecological processes, and recycling. Nourishment and well-being are achieved through the ecology of the specific production environment. For example, in the case of crops this is the living soil; for animals it is the farm ecosystem; for fish and marine organisms, the aquatic environment.



Organic farming, pastoral and wild harvest systems should fit the cycles and ecological balances in nature. These cycles are universal but their operation is site-specific. Organic management must be adapted to local conditions, ecology, culture and scale. Inputs should be reduced by reuse, recycling and efficient management of materials and energy in order to maintain and improve environmental quality and conserve resources.

Organic agriculture should attain ecological balance through the design of farming systems, establishment of habitats and maintenance of genetic and agricultural diversity.”

In 1981 the United States Department of Agriculture (USDA) produced a definition of organic agriculture which is arguably more accessible to farmers (*Woodward 2002* :

“Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilisers, pesticides, growth regulators and livestock feed additives. To the maximum extent feasible, organic systems rely on crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, and aspects of biological pest control to maintain soil productivity and tilth, to supply plant nutrients and to control insects, weeds and other pests.

The concept of the soil as a living system....that develops.....the activities of beneficial organisms... is central to this definition”

Here we can see what organic farmers do not do, what positive things they do instead and the context in which they work; i.e. the living soil.

Here is the key to understanding what organic farm management looks like – or should like look – wherever it is. It concentrates primarily on adjustments within the farm and farming system, in particular rotations and appropriate manure management and cultivations, to achieve an acceptable level of output. External inputs are generally adjuncts or supplements to this management of internal features. This is the common basis of organic agriculture where ever it is found in the world – practical, clear and coherent enough for all but the dullest or most obstructive.

The health of soil, plant, animal, man (and the planet) is one and indivisible

Establishing that organic farming is built on a concept of health with management practices based on ecological systems is important but it does not go far enough in explaining the perceived wholistic nature of health, farming and food. For this, a consideration of the ideas of Lady Eve Balfour is needed (*Woodward 2006*).



In her seminal book “The Living Soil”, first published in October 1943, Eve Balfour argued that the health of the soil was the same as the health of the plants that grow in it and the animals which eat those plants and the health of the humans which eat both.

At an earlier stage of her work, Eve Balfour thought of soil, plant, animals and man as separate entities that were somehow linked together. Her concern – and that of a number of leading mainstream scientific thinkers – was to find “the missing link”; the crucial component that made this vital link. However, influenced by Drs. Scott Williamson and Innes Pearce of the Pioneer Health Centre and the Peckham Experiment, she came to the conclusion that they are not separate and linked but are one and indivisible.

Core Concepts of “The Living Soil”

Eve Balfour’s thinking revolved around four notions which she discussed in varying depths in her book. These were:

- A biologically active, living soil is an essential prerequisite for soil fertility and that the role of soil micro-organisms (especially fungi) is particularly important - this was highlighted by the research of Dr Rayner on mycorrhiza.
- This natural soil fertility is maintained and enhanced by the return and addition of organic material in the form of compost - Sir Albert Howard was the leading proponent of this “compost-farming”.
- The third concept came from the nutritional studies of Sir Robert McCarrison who found that the diets of the healthiest peoples he studied were: “for the most part, fresh from its source, little altered by preparation and complete; and in the case of those based on agriculture, the natural cycle – (wastes to soil to plants to animals/man) is complete”.
- Fourthly, that all living things are whole entities with their own integrity but they function in “mutuality of action” with all the other entities in their environment, so that whilst they are independent only a functional relationship between them can sustain the health of the whole. This holistic perspective was primarily provided by George Scott Williamson and Innes Pearce.

Lady Eve was more of a “doer” than a “thinker” and she quickly began to focus on what could be done practically to improve health. She came up with five propositions as, she later put it; “1) The primary factor in health (or lack of it) is nutrition. 2) Fresh unprocessed natural whole foods (such as wholewheat bread, and raw vegetables and salads) have a greater nutritive value than the same foods when stale, or from which vital parts have been removed by processing, or have been destroyed by faulty preparation. 3) Fresh foods are more health-



promoting than preserved foods (dried, canned, or bottled). 4) The nutritive value of food is vitally affected by the way in which it is grown. 5) An essential link in the nutrition cycle is provided by the activities of soil fungi, and for this and other reasons the biological aspects of soil fertility are more important than the chemical.”

She felt that the first two of these propositions “have been pretty conclusively proved”, but that although the evidence to support the other three was strong, they had not been proven and “it has become a matter of the utmost national urgency to submit them, without delay, to a final and conclusive test.”

It was this process that most intrigued sympathisers from the scientific establishment such as Viscount Bledisloe, a Parliamentary Secretary to the Ministry of Agriculture and Chairman of the Lawes Agricultural Trust, which ran Rothamsted, the country’s leading agricultural research station.

Bledisloe readily accepted McCarrison’s argument that “immunity from degenerative human disease followed the ingestion of a fresh, well-balanced diet of unprocessed natural foods”. He also accepted Howard’s work on compost and how it engendered resistance to disease in otherwise susceptible crops. Yet, does this mean that there is a “consequential relation between humus and human health”? Bledisloe, “Viewed from a strictly scientific standpoint, there is, it would appear, a small but important ‘missing link’ in the chain of contact” and he welcomed the idea of a “perhaps epoch-making experiment” which would investigate the possibility of such a link. (*Woodward 2006*)

Transmitting health and making health infectious

The mechanism or process by which health can be transmitted is the weakest, although arguably the most important, aspect of the whole *Living Soil* argument. It was not adequately defined or even described in any of the early editions of the book. Its existence is alluded to through an association of the words “vitality”, “living” and “quality”. At various points Lady Eve uses the terms “soil fertility” and “soil vitality” interchangeably. She then makes a theoretical link with the quality of food and health by what is, in essence, a linguistic or textual association.

In the 1976 edition published in the United States as *The Living Soil and The Haughley Experiment*, she makes a rather more precise effort to describe the process and picks up on the Scott Williamson and Pearse idea that: “health is not a state but a dynamic process.....The early pioneers believed that its course is identical with the flow of the nutrition cycle, and that to promote it one must, therefore, keep open all the living channels of this flow, though no one yet knows what they all are, or even the true nature of the flow itself. That land is a great storehouse for it, however, seems clear. What then is land? Let me



give the late Aldo Leopold's definition: 'Land...is not merely soil: it is a fountain of energy flowing through a circuit of soils, plants and animals. Food chains are the living channels which conduct energy upward: death and decay return it to the soil.' Soil fertility he defined as 'the capacity of soil to receive, store and transmit energy.' Lady Eve then continued: "The concept that the nutrition cycle is not merely a transfer of nutrient materials from one form of life to another, but also a circuit of energy, though even now not universally accepted, is no longer considered revolutionary, and under the name of ecology has become an acceptable subject for research."

There is a touch of revisionism here about the thinking of the early pioneers and many would think that she is stretching the definition of ecology and it is a moot point as to whether this gets any nearer to describing what the "consequential relationship" between soil and health might be. Depending on taste, one might see Leopold's imagery as poetic and powerful, or as fanciful and obscure, but certainly it adds nothing from a scientific perspective and only serves to reinforce the lack of evidence.

However Lady Eve was determined to find that evidence and to understand the "functional relationships" of organic entities – "man, animal, plant along with...the living inhabitants of the soil". Because she had concluded that between these entities there is no 'missing link', there is a "mutuality of action".

Drawing on the work of Scott Williamson and Pearse at the Pioneer Health Centre in Peckham she hypothesised that ".all disease might be a symptom of unbalance between a living organism and its total environment, and that the key to health would not be found through the fragmentary approach of seeking the cause of specific diseases, but in studying living function between organisms and their environment as a dynamic whole."

She therefore resolved to establish the Haughley Experiment to be "a type of comparative research different from any existing agricultural research". And the inclusion of a more or less closed system – fundamentally at odds with Howard's Law of Return - ensured that it was. (*Woodward 2006*)

The Haughley Experiment

Work on the Haughley Experiment got under way in 1947 and from the beginning was beset by management difficulties, methodological problems and lack of funding. It was a stop and start, debilitating experience but in establishing three comparative working "farmlet" systems on one sizeable area of land with the same soil type, it was innovative and ground breaking.

Three systems were established: a linear input/output system using only synthetic agri-chemicals (called the Stockless Section) ; a mixed cropping and livestock system recycling



nutrients from within the system supplemented by bought in feed and fertilisation (called the Mixed Section); and a closed system with livestock and cropping with no outside inputs (misleadingly called the Organic Section).

For the most part data collected from the experiment was not analysed (and of course analytical methods of the time would be considered inadequate today) and in most cases (but not all) the published results were not peer reviewed. However there are some notable findings:

- Plant growth patterns between the sections were significantly different
- Nitrogen levels in cereals and aphid numbers were significantly higher on the stockless section
- Humus levels in the organic (closed) system over time were significantly higher than the mixed system despite no fertiliser or external organic manure input and both were significantly higher than those in the stockless section
- Milk yields were comparable between the closed and mixed sections despite significantly lower feed intake
- There was significantly greater longevity and fertility of cows in closed section

The differences between the Stockless and the Mixed and Closed Sections are not surprising. However, the differences between the Mixed and Closed Sections are and are at odds with the conventional scientific knowledge of the time and, for the most part, of today also.

The major limitations of the Haughley Experiment in terms of resources, management and methodology mean that we can draw no conclusions as to whether these differences tell us anything about “mutuality of actions” of whole organisms or the transmission mechanism of health.

Innes Pearse hypothesised that this is based on “each taking what it needs and rejecting what it has had no use for, thereby sustaining the needs of others (within their mutual inhabitation of the ecosphere). As a shift occurs through the action of one, so all shift within the functional organisation of the *whole*. But more than this. What each utilises in building up its own substance and carrying out its proper function, it stamps with its own specificity - its own ‘individuality’, or uniqueness. In the traffic of exchange there are then to be sought different types of contribution within the whole. There is that which is of specific pattern; and that, too, which is ‘anonymous’ and in use common to all. ‘Heat’ for example, generated in any transaction passes ‘unlabelled’ in its going, while there is that which having passed through the living organism, when ejected into the traffic stream, is imprinted with its



specific identity, and leaving there its imprint on the scene for us to find – if we care to look!”
(Woodward 2006)

Research evidence since Haughley

Since the The Haughley Experiment ended a reasonable amount of research has been completed by a wide range of institutions from different countries revealing a clear trend that organic produce (in appropriate crops) contains more desirable components (vitamins, dry matter, protein, phytochemicals (including antioxidants and phenols) and fewer undesirable substances (pesticide residues, nitrates, sodium and some heavy metals) than conventional produce.

In livestock trials, animals fed on organically grown feed generally show greater fertility and longevity, higher healthy fatty acids and a better Omega 3 to Omega 6 ratio than those on conventionally produced feed (*FiBL and ORC 2015*).

Most of this work has been carried out using mainstream methods and statistical analysis; however some so-called “novel or complementary methods” of analysis have been used in some of the trials. Picture-developing methods, Bio-crystallisation, Fluorescence-stimulation spectroscopy and forced-storage tests have been used to measure factors that are not revealed by chemical analysis. As most of these methods have now been validated under the International Organisation for Standardisation (ISO) we can have confidence in their findings.

The factors revealed have been called vitality and structural energy. Clear differences have been shown between organic and conventional systems; between fertilisation regimes; between plant and seed varieties; and between growing conditions. It is postulated that these differences might be important for health. Further work is needed on these approaches but they might provide the evidence of a positive health dynamic and help identify how we can farm to optimise health.

Towards Whole Health Agriculture

At the moment we cannot be definitive on how to farm for health or how to make health infectious. We do not know what the important transmission factors are or how the “mutuality of actions” work – whether through micro organisms, bacteria, energy, vitality, self – organisation or something else?

However we do know there are some things which are likely to be important and which farmers should pay attention to; these revolve around managing the soil and above and below ground livestock through biological system management and not through inputs whether these are synthetic or organic.



Whole Health Agriculture as an organisation is undertaking case studies of farmers to understand what works and what doesn't, how and why. We welcome farmers and growers who wish to join us in the vital exploration (*WHAg 2019*).

References and source reading:

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