

## Response to Roger Watson's Article: Terrain Theory Terrorists, 21 August 2022

Roger Watson's article '[Terrain Theory Terrorists](#)' is disappointingly emotive, labelling terrain theory as nonsense and quoting Wikipedia's opinion that terrain theory is an 'obsolete variation' of 'germ theory denialism'. Just because one article in Wikipedia says something is a fact, does not make it so. Roger Watson also makes some very sweeping, but unsubstantiated, statements such as 'But the....doctors who adhere to (terrain theory) do not use or prescribe antibiotics and, needless to say, they are anti-vaxxers'. Is there a survey of these doctors to find out to what extent they support terrain theory and whether or not they prescribe antibiotics or are anti-vaxxers? No, it seems not, or he would have provided a reference to it. Had this survey actually existed, I would certainly have known of it and furthermore, I don't believe that it would have produced the results that he claims. His gross generalisations about doctors fail to recognise any degree between two extremes, for example, dishing out antibiotics like smarties and never prescribing them on principal. What about a mid-way point of restricting their prescription for occasions when an infection is not likely to clear up without them, which is in fact the [official NHS guidance](#)? Similarly he believes that one is either a germ theory adherent or a germ theory denier through advocating terrain theory. Such polarisation is completely unnecessary and does not, in any case, reflect the real world where degrees of opinion exist.

As a medical researcher, I would like to demonstrate (with appropriate references) that it is possible for terrain theory to coexist peacefully with germ theory and that espousing this viewpoint does not make one a 'flat earther'. Roger Watson has anticipated ridicule, personal attacks by sockpuppets etc. Possibly he has been waylaid by some vehement and aggressive germ theory deniers, but I have no intention of employing any of these methods. For a start, I agree that germs (bacteria, viruses, parasites, etc) exist and there is ample evidence for this; indeed since the invention of the high magnification electron microscope, many of them can now be seen. Instead I will attempt to show that the terrain is also important.

Firstly, what is germ theory (a point that Roger Watson does not adequately cover in his article)? Germ theory states that a number of diseases are caused by [microorganism/germ invasion of the body](#). This has now evolved into the '[microbial theory of disease](#)' and is currently accepted as the medical model, for which prevention takes the form of avoidance and vaccination, while treatment involves pharmaceutical drugs, as we saw with COVID-19.

Unfortunately, possibly because of encounters with rabid germ theory deniers, it is clear that Roger Watson does not really understand terrain theory. Yet he appears to accept some of its tenets with his statement 'In the fields of biology and medicine, it is already known that we live in harmony with a myriad of microbes and that these are generally harmless until the condition of the body is compromised nutritionally or immunologically or if the balance of our commensals is upset, for example, by chemotherapy treatment for cancer or by taking a course of antibiotics.' Yes indeed, this is exactly terrain theory: where the nutritionally or immunologically compromised condition of the body alters the general harmlessness of our microbes, rendering them potentially disease-causing.

Terrain theory, then, is essentially what determines whether a germ infects us or it doesn't and if it does, how badly we are affected. We have all seen in families how one person gets really sick with the flu, others are mildly affected and some seem to escape symptoms altogether. It's all the same virus, so what determines this difference? The terrain, or health

status, of the individual; a healthy body will assist in fighting off a germ, whereas a body which is already struggling with a health issue could have difficulty. Interestingly, [Wikipedia's entry on germ theory](#) makes reference to environmental and genetic factors influencing the response to exposure (infection or no infection) and to disease severity if infected. Clearly this article on germ theory was not written by the same person who wrote about 'germ theory denialism' as quoted by Roger Watson. It's always dangerous to quote an article on Wikipedia as an authority, as there is often another one under a different heading that contradicts it! A more reliable source, a biology dictionary, similarly recognises that '[environmental and genetic factors may predispose a host or influence the severity of the infection](#)'.

Terrain theory has honourable beginnings, originating with the scientists Claude Bernard and Antoine Béchamp, roughly contemporaries of Louis Pasteur, who originated germ theory in the 19th century. Science as we know it today was then in its infancy, so much of what all three scientists postulated has now been overtaken but nevertheless, germ theory has evolved down one route and terrain theory down another.

We can see that germ theory focuses exclusively on the germ, while terrain theory is about the susceptibility to illness or serious disease due to the state of the body. Whereas germ theory advocates avoidance and vaccination, as we saw above, terrain theory recommends getting your body as healthy as possible and boosting your immune system to better fight off the germs. So we need to take account of both theories in public health, not just the one.

This is admirably encapsulated in a graphic found on several health websites but which possibly originated with [Dr Robert Young](#):



So how does this work in the real world? Let me give a couple of examples from the gut, which many have stated is the [principal regulator of human health](#). The gut has long been known to contain a mixture of [bacteria, viruses, parasites, fungi etc](#). Interestingly, a team from Imperial College, London, reported in 2004 that '[The majority of cells in the human body are anything but human: foreign bacteria have long had the upper hand](#)'. The Imperial College team found around 100 trillion microorganisms in the human gut, which together

have a weight of up to one kilogram. The lead author, Professor Jeremy Nicholson, wrote “It is widely accepted that most major disease classes have significant environmental and genetic components and that the incidence of disease in a population or individual is a complex product of the conditional probabilities of certain gene components interacting with a diverse range of environmental triggers.”. What does he mean by ‘environmental triggers’? That would be the terrain, the internal and external environment which affect the body. Similarly, others have reported that the [gut microbiota composition is influenced by many factors](#), including nutrition, stress, pollutants, antibiotics and other drugs, collectively known as the exposome; again, this represents the terrain.

The gut contains vast quantities of bacteria, some beneficial, some neutral and some disease-causing. What determines the balance between them, thereby determining whether the body exhibits health or disease? A diet of real food, with plenty of [fibre and vegetables](#) and a healthy lifestyle with adequate [exercise](#) are huge beneficial influences, whereas malign influences include [processed \(as opposed to real\) food](#), [sugar](#) (because it promotes disease-causing bacteria), [smoking](#), the quantity of [antibiotics](#) taken (because they wipe out many of the beneficial bacteria) and environmental toxins such as the herbicide [glyphosate](#), found in Bayer’s Roundup. Numerous studies have also shown that gut health can be improved by taking [probiotics](#). All these factors influence the gut bacteria terrain, which in turn will influence whether or how much someone succumbs to, for example, bacteria such as salmonella or clostridium difficile.

The gut also contains many viruses; some will be gut viruses but the gut is also a key reservoir for any number of [other viruses](#) such as the [herpes virus](#), which can cause chickenpox in children and can be reactivated to cause shingles in adults. A healthy immune system keeps stored viruses dormant, while a [suppressed or deficient immune system](#) allows them to flourish.

What makes for a healthy immune system? Important beneficial influences on the immune system are real food, [adequate protein](#), plenty of [vegetables](#), sufficient natural [sleep](#), a [healthy gut](#), absence of [sugar](#), moderate [exercise](#), minimal [stress](#) and no [smoking](#). The health of the body’s immune system is also strongly influenced by the health of the [gut microbiome](#) because [70%-80% of the cells of the immune system reside in the gut](#). Numerous studies have also shown that the immune system can be supported by taking adequate [vitamin C](#), [vitamin D](#), [zinc](#), [probiotics](#) etc. This is the terrain: an immune system which, if supported by mostly beneficial influences, keeps disease-causing viruses dormant, or a deficient immune system, damaged by mostly malign influences, which allows viruses to reactivate.

So the terrain influences whether health or disease results from exposure to disease-causing germs; it is not solely the presence in the body of the disease-causing germs. Since we are exposed to infinite numbers of disease-causing germs every day, both in the body and outside of it, if our health depended exclusively upon germ theory, then we would all be sick all the time. In fact, it is highly unlikely that the human race would have survived past a few hundred years!

