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Ellen White, Health, and the Third Angel's Message: Part 1–Improving Health through Reducing Transmissible Diseases

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Introduction

Humans were made in God's image, but after the rebellion in Eden His portrait commenced to be erased through disbelief and disobedience. This process has continued so that the portrait may be hardly discernible in those unconnected with Him.

Moral decline was early evident in three areas: a). Human relationships with God suffered first (Gen 3:8–10). b). Interpersonal relationships were the second casualty (Gen 3:12–13). c). The relationship of humanity to the natural world was the third area of dysfunction (Gen 3:17–19). Satan was active in distancing humanity from the idea that God's world was theirs to care for. Humans mistreated the environment, the animals in it, and adopted a meat-based diet.

Now far removed from the cross, and with moral degradation rampant, God is giving a last opportunity to earth's inhabitants to worship their Creator (Rev 14:6–12). Fundamentally, the call commences with an urgent proclamation of the everlasting gospel to all, which involves individuals giving consent to be conformed to Christ's image (Rom 8:29; Eph 2:10). The purpose of Calvary was to enable the restoration of the moral image of God in the human family. By becoming sons and daughters of God's kingdom of grace, such would become heirs in His kingdom of glory.[1]

Today God invites hearers to accept the means of healing the rift between God and the human race. The restoration of the moral image of

[1] E. G. White, "God Made Manifest in the Flesh," *Signs of the Times*, January 20, 1890.

God in the race cannot take place apart from a transformation in thinking. The apostle Paul leaves us little room to maneuver around the question of how we might bring glory to God in the words: "whether you eat or drink, or whatever you do, do all to the glory of God" (1 Cor 10:31). This means responders to God's appeal develop advanced ideas about healthful living. This thought is echoed by the apostle John when he penned the appeal to come out of Babylon (Rev. 14:8–11). This involves evaluating its ways of gaining pleasure and developing a sense of purpose consistent with God's standards elaborated in Scripture (v. 12). God's instruction on the value of human life relates also to preserving health and avoiding self-harm.

The work of health reform enables clear thinking and assists in the reconstruction of God's image in followers (sanctification). Indeed we can hinder the advancement of heaven's work and misrepresent God to others by our disregard for the principles of healthful living.[2] The apostle Paul, in typical fashion, is quite blunt asserting that it is the duty of Christians to present their bodies a "living sacrifice" to God (Rom 12:1). In essence all sacrifices offered to God were without blemish (Lev 22:20; cf. 1 Peter 1:19) and Paul's meaning is that we should do all in our power to preserve our bodies in peak condition (as dictated by restrictions in genetic capacity) so as to bring glory to God. After all, our spiritual advancement is dependent on the attention given to mental, physical, and social development.[3] No wonder then that Ellen White represents the health message as being intimately associated with the proclamation of the third angel's message, for this message embraces that of the first and second angels.[4]

Alert readers of the discourse in Revelation 14 will immediately notice that reference is made to the creation event (v. 7). Unmistakably, when this record is read, a vegetarian life style is promoted (Gen 1:29). Such advanced thinking not only serves to protect the magnificent machinery of the human body, but also serves the interests of the animal world, too. They should not suffer from cruelty and death on account of our misguided appetite.

The writings of Ellen White were given to assist advanced thinking along biblical lines in a period of changing ideas in the domains of theology

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[2] E. G. White, *Counsels on Diet and Foods* (Washington, DC: Review and Herald Publishing Association, 1946), 45, 165.

[3] E. G. White, *Testimonies for the Church* (Mountain View, CA: Pacific Press Publishing Association, 1948), 3: 50–52.

[4] *Ibid*., 161; E. G. White, *Testimonies for the Church* (Mountain View, CA: Pacific Press Publishing Association, 1948), 8: 197.

and science. I will seek to illustrate this using examples painted in the context of the times in which she wrote, which will allow informed assessment of her reliability. My starting point will be with transmissible diseases and I will attempt to establish robust structures to carry us safely through the modern world.

Setting of the Times

The elegant experiments of Louis Pasteur in 1862 marked a turning point in the development of the science of microbiology. He showed that microbes are capable of fermentation activity and are abundantly present in the air [5] Excitement continued to be experienced in the biological sciences as G. A. Hansen in Norway named the elusive bacterium associated with leprosy in 1873, but the defining highlight was Robert Koch's demonstration that bacteria were the cause of some diseases. In a series of masterful experimental steps, he showed that the diseases known as anthrax (1876) and then tuberculosis (1882) were caused by bacteria. He received the Nobel in Physiology or Medicine in 1905 for his discoveries.[6] Many other momentous advances were made within a relatively short time period, including the discovery in 1892/1898 of the infectious entities in tobacco plants we now call viruses.[7] Scientific concepts and terms began to change rapidly as a consequence of these and other discoveries.

While this excitement and advance was beginning, the significant health vision of 1863 came to Ellen White. Her instructions were to intersect with and challenge the emerging Seventh-day Adventist church and its followers. Reactions were mixed but disbelief began to give way to the findings of science. However the saga has not ended. Now we can find her words being judged on the basis of the current meaning of terms and understandings of words, as though the passing of over 150 years has accounted for nothing.

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[5] David Darling, "Pasteur, Louis (1822–1895)," *Encyclopedia of Science*. Online: http://www.daviddarling.info/encyclopedia/P/Pasteur.html (15/10/2015); David Darling, "Leprosy," *Encyclopedia of Science*. Online: http://www.daviddarling.info/encyclopedia/L/leprosy.html (15/10/2015); David Darling, "Koch, Robert (1843–1910)," *Encyclopedia of Science*. Online: http://www.daviddarling.info/encyclopedia/K/Koch_Robert.html (13/02/2014).

[6] Nobel Prize Organization, "Robert Koch—Biographical." Online: http://www.nobelprize.org/nobel_prizes/medicine/laureates/1905/koch-bio.html (15/10/2015); A. Sakula, "Robert Koch: Centenary of the Discovery of the Tubercle Bacillus," *Canadian Veterinary Journal* 24(4) (1983): 127–131.

[7] H. Lecoq, ["Discovery of the First Virus, the Tobacco Mosaic Virus: 1892 or 1898?"]. *Comptes rendus l'Académie des Sciences*, Série III, 324(10) (2001): 929–933.

This means that some of her writings are lauded as being prophetic on the one hand, hopelessly out-of-date on the other, or simply puzzling.[8] No benefit comes from promoting the two former views. In this article I attempt to clarify some of the issues that puzzle and in doing so affirm others in saying that the last word has not been spoken yet on this subject.[9]

This essay will be directed particularly to transmissible diseases such as cholera, leprosy, and tuberculosis, and I will attempt to establish the reliability of her claims about cancer.

The Vision of 1863 and the Sequel

Ellen White's vision of June 6, 1863 marked a turning point in the outlook and mission of the fledgling Seventh-day Adventist church, which was officially formed May 21 of the same year. The approximately 45 minute vision was to change not only White's view of health but that of a large number of others too, for they began to see the preservation of health as "a sacred duty." The health message as recorded in 1865 was referenced to the exodus experience and was to become an integral part of the third angel's message to the world to prepare a people for the coming of the Lord and exodus from this world.[10] As we will see in due course, some elements of the vision were radical departures from accepted practices and others were well in advance of the times. It is also true to say that there was much that could be accepted by experts of the day. Fidelity to the counsel received was vital to the physical, mental, and spiritual health of those who heard and read the words of the vision, as well as to confidence in the prophetic gift. The same applies to this day.

The vision was first recorded in *Spiritual Gifts* and then an expanded version appeared in a series of pamphlets under the title "How to Live."

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[8] D. Anderson, "Contradictory Testimonies on Pork." Online: http://www.ellenwhiteexposed.com/contra2.htm (15/10/2015); D. Fortin, 2006. "'Problem' Statements in Ellen White's Writings." PPT slide presentation, Andrews University. Online: www.andrews.edu/~fortind/EGWProblemStatements2006.ppt (15/10/2015); G. B. Paulien, *The Divine Prescription and Science of Health and Healing* (Brushton, NY: Teach Services, Inc., 1997), 447; D. Vierra, 2014. "The Danger of Eating Pork." Online: http://modernmanna.org/categories/Health-Articles/The-Danger-of-Eating-Pigs/ (15/10/2015).

[9] L. H. Barnard, "That Dirty Pig!" *The Ministry* 65(10) (1972): 32–35.

[10] D. E. Robinson, *The Story of Our Health Message* (Nashville, TN: Southern Publishing Association, 1965), 75–80; E. G. White, *Selected Messages* (Washington, DC: Review and Herald Publishing Association, 1958), 2: 412, 461, 474.

These latter are available in *Selected Messages*.[11] The account in this series is arranged in a clearer fashion than in the former book. A number of fundamental ideas can be identified from the vision with emphasis on preventive public health aspects. The most relevant to note here is the emphasis on a holistic approach to health and the insistence that there are God-given principles of health that, if followed, will minimize disease. The vision dealt with principles relevant to transmissible and life-style diseases as well as to some environmental risk factors.

The vision was very comprehensive and some aspects may not be fully appreciated today. It is fair to add that a number of principles such as cleanliness, drinking pure water, exposure to sunshine and fresh air, eating wholesome food, and even vegetarianism, were already promoted in some sections of society. However these views were not commonly accepted by many of the educated class of the day.[12] White advocated studying from cause to effect. She followed the lead of science in being immunized against smallpox and advising others of her staff to do likewise.[13] In this way she advertized her forward looking approach.

Transmission of Disease Organisms/Agents

White wrote mainly from a hygienist's point of view rather than a medical viewpoint as illustrated by reference to an article in the *Health Reformer* in 1873 dealing with typhoid fever. The article emphasized that the latter spoke of germs, the former of poisons taken into the system.[14]

In the decade in which White first wrote some major discoveries were made. In 1867 Joseph Lister implemented the use of carbolic acid during surgery. There was a marked increase in survival rates. This step led on from Louis Pasteur's discovery (1861) that microbes were abundantly present in the air.[15] In the next decade (1876), Robert Koch precisely demonstrated a clear association between a defined bacterium and the

[11] White, *Selected Messages*, 2: 411–479.

[12] G. W. Reid, *The Sound of Trumpets* (Washington, DC: Review and Herald Publishing Association, 1982), 37, 40.

[13] White, *Selected Messages*, 2: 303, footnote by D. E. Robinson.

[14] M. G. Kellogg, "Typhoid Fever," *Health Reformer* 8(12) (1873): 253–256.

[15] A. Miles, "Lister's Contributions to Microbiology," *British Journal of Surgery* 54(13): 414–418; F. N. L. Poynter, "The Contemporary Scientific Background of Lister's Achievement," *British Journal of Surgery* 54(13): 410–415.

disease anthrax.[16] Clearly, the scientific world was on the cusp of a new era. However, American scientists were remarkably slow to accept these ideas until the mid-1880s.[17]

The idea that diseases were transmissible comes from antiquity. The biblical record on the conditions termed leprosy carried the implicit information that some of the conditions described by the term (Lev 13) were transmissible. Indeed, the ancients had well-rehearsed methods of overcoming cities by placing carcasses in water supplies or hurling diseased material into besieged cities.[18] Cancer was also considered infectious and that from the sixteenth century and before, although the mechanism was not understood or the agent identified.[19]

One thing should be abundantly clear from White's writing in 1865, she conveyed firm ideas about transmissibility of disease from animals to humans. The term "zoonoses" was coined by the German physician Rudolf Virchow in 1855 in his study of *Trichinella* to memorialize the idea. He understood that veterinary and human medicine could not be separated.[20] White's advice was consistent with this important lead, although it is not possible to know what information she had access to, especially since the first recorded United States case of the disease occurred in 1864.[21] Other significant developments in this area have been noted already in the section Setting of the Times.

Besides indicating that diseases could be acquired through the foods chosen, White also made suggestions about the significance of exposure to fresh air, sunlight, the use of clean water, and the significance of cleanliness

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[16] S. H. E. Kaufmann and U. E. Schaible, "100th Anniversary of Robert Koch's Nobel Prize for the Discovery of the Tubercle Bacillus," *Trends in Microbiology* 13(10) (2005): 469–475.

[17] P. A. Richmond, "American Attitudes Toward the Germ Theory of Disease (1860–1880)," *Journal of the History of Medicine and Allied Sciences* 9(4) (1954): 428–454.

[18] K. Judson, *Chemical and Biological Warfare* (Tarrytown, NY: Benchmark Books, 2004), 65–66.

[19] M. E. McLaughlin-Drubin and K. Munger, "Viruses Associated with Cancer," *Biochimica et Biophysica Acta* 1782(3) (2008): 127–180; D. J. Th. Wagener, *The History of Oncology* (Houten, The Netherlands: Springer, 2009), 28.

[20] C. Brown, "Virchow Revisited: Emerging Zoonoses," *ASM News* 69(10) (2003): 493–497.

[21] A. Flint, *A Treatise on the Principles and Practice of Medicine: Designed for the Use of Practitioners and Students of Medicine*, second edition (Philadelphia, PA: Henry C. Lea, 1867), 486.

in promoting good health. Some of these measures were advocated as ways in which infectious disease could be prevented.

Changing Concepts of Disease and Some Challenging Statements

White's vision was given at time when revolutionary change was occurring in the biological sciences. Great uncertainty and difference of opinion existed even among the experts. After the health vision, Ellen White continued to receive instructions about healthful living. Some of these later writings have caused confusion. I will look at groups of these dealing with transmissible diseases.

We should not expect White to use modern terms to describe agents of disease, just as we do not expect the Bible to make statements in modern terms. To a large extent, the issue of translation across eras is responsible for some authors stumbling over Ellen White's words and claiming outstanding predictive statements and, equally, others use the same words to cast doubt on her credibility because they find no current scientific evidence in support of her words. The nature of knowledge is ever changing so what today is laughable tomorrow is in the headlines. With these thoughts in mind, some of the statements in the health vision that have challenged readers on infectious diseases are given below (accessible on E. G. White Writings CD).

> The eating of pork has produced scrofula, leprosy and cancerous humors. Pork-eating is still causing the most intense suffering to the human race.[22] 1864

> Cancerous humor, which would lie dormant in the system their lifetime, is inflamed, and commences its eating, destructive work [as a result of weakening the life forces].[23] 1864

> Flesh meats constitute the principal article of food upon the tables of some families, until their blood is filled with cancerous and scrofulous humors.[24] 1875

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[22] E. G. White, *Spiritual Gifts* (Washington, DC: Review and Herald Publishing Association, 1945), 4a:146.

[23] E. G. White, *An Appeal to Mothers* (Battle Creek: Steam Press of Seventh-day Adventist Publishing Association, 1864), 27.

[24] White, *Testimonies*, 3:563.

> Cancers, tumors, and all inflammatory diseases are largely caused by meat-eating.
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> From the light God has given me, the prevalence of cancers and tumors is largely due to gross living on dead flesh.[25] 1890
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> The testimony of [meat] examiners is that very few animals are free from disease, and that the practice of eating largely of meat is contracting diseases of all kinds,—cancers, tumors, scrofula, tuberculosis, and numbers of other like affections.[26] 1897
>
> Many people are eating meat filled with consumption and cancerous germs. At the present day animals are suffering from all kinds of deadly diseases.[27] 1901
>
> People are continually eating flesh that is filled with tuberculous and cancerous germs. Tuberculosis, cancer, and other fatal diseases are thus communicated. The tissues of the swine swarm with parasites.[28] 1905

It will be readily apparent that work needs to be done on understanding the words "leprosy," "humors," and "scrofula." Equally, some understanding of disease transmission and latency is required to enable judgment to be made about the accuracy and possible predictive nature of White's statements.

Keen readers will have noticed already that White tended to dispense with some terms and expressions over the years and replace them with others.[29] The trends are illustrated in Table 1 below.

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[25] White, *Counsels on Diet*, *388*.

[26] *Ibid.*

[27] E. G. White, *The Paulsen Collection of Ellen G. White Letters*, July 15, 1901 (1985), 1.

[28] E. G. White, *The Ministry of Healing* (Mountain View, CA: Pacific Press Publishing Association, 1942), 313.

[29] E. G. White, *An Appeal to Mothers,* 27; "Early Counsels on Medical Work—no. 1 Health" *Review and Herald* 91(14) (1914: 3, 4; *Counsels on Diet*, 385–388; 392, 393; *Ministry of Healing*, 313; *Paulsen Collection of Ellen G. White Letters*, July 15, 1901, 1.

Table 1. Terms applied to the principle involved in the induction of diseased states in humans as a consequence of meat eating or to the disease state itself.

Term	Principle involved/disease transmitted	Disease state in animals (meat)	Unhealthy state produced in humans	Date
Poison-ous flesh	Contagious diseases	Plague	Disease	1864
Humor(s)			Cancerous humor; leprosy	1864
Humors	Impurities		Scrofula, leprosy, and cancerous humors	1865
Humors	Impure blood		Scrofula and other humors	1868
Humors and poison	Humors and poison	Diseased		1870
Humors		Cancerous and scrofulous humors inferred	Cancerous and scrofulous humors	1875
Humors			Fevers, scrofula, and cancers	1876
Germs	Consumption and cancerous germs	Various		1901
Germs	Germs	Tuberculous and cancerous conditions	Tuberculosis, cancer, and other fatal diseases	1905
Parasites	Parasites		Disease (inferred by context)	1905
Humors			Leprosy	1914; but excerpts from 1864

She used the term humor(s) to describe both the principle transferred from animals to humans responsible for disease and to the disease entities circulating in the body fluids as a result of meat eating. The two usages can be seen in the following statements.

> Those who subsist largely upon flesh cannot avoid eating the meat of animals which are to a greater or less degree diseased. The process of fitting the animals for market produces in them disease; and fitted in as healthful a manner as they can be, they become heated and diseased by driving before they reach the market. The

> fluids and flesh of these diseased animals are received directly into the blood, and pass into the circulation of the human body, becoming fluids and flesh of the same. Thus humors are introduced into the system. And if the person already has impure blood, it is greatly aggravated by eating of the flesh of these animals. (1897, 1898).[30]

> Flesh-meats constitute the principal article of food upon the tables of some families, until their blood is filled with cancerous and scrofulous humors. Their bodies are composed of what they eat. (1875, repeated 1890 in slightly different words).[31]

Humors in Ancient and Modern Thought

The word "humor" has a long history in medicine, but need not be misunderstood when its historical and scientific usage is appreciated. At the beginning of Greek medicine we find that it was Hippocrates and Galen who postulated that disease resulted from a corruption of the humors of the body. This theory asserted that there were four humors: blood, phlegm, yellow bile, and black bile. Each humor supposedly was associated with a major organ. When the humors were out of balance disease developed, so the treatment was to re-establish harmony. This theory was challenged by Francastoro (end of 15th century) who postulated that epidemic diseases could be transmitted by small particles carried either by animate or inanimate objects.[32] This idea was not underpinned by microscopic observations, but nevertheless was entertained by some.

At the end of the eighteenth century in the United States there were two theories of disease: imbalance of the humors and tension and relaxation of the solid parts of the body (solidism).[33] In practical terms the latter theory meant that it was necessary to stimulate or reduce nervous activity. Despite the alternative views, the humor theory of disease dominated medical thought until the commencement of the nineteenth century. During this period of history articles appeared heralding the second epoch of humorism

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[30] E. G. White, *Testimonies for the Church* (Washington, DC: Review and Herald Publishing Association, 1948), 63.

[31] White, *Counsels on Diet*, 233.

[32] F. H. Garrison, "Francastorius, Athanasius Kircher and the Germ Theory of Disease," *Science*, new series, 31(796) (1910): 500–502.

[33] D. J. D'Elia, "Dr. Benjamin Russ and the American Medical Revolution," *Proceedings of the American Philosophical Society* 110(4) (1966): 227–234.

where real substances replaced imaginary ones (i.e., black and yellow bile). To illustrate, we find that under the general heading of progress in animal chemistry the fluids of the body were listed by W. B. Johnson in 1804—saliva, tears, nasal mucus, pus (scrofulous, venereal, cancerous and hospital-sore), synovial, sperma virile, etc.[34] In the new world of ideas surrounding humors, alteration of body fluids commonly was seen as the cause of disease.[35] However, such ideas were doomed. The influential American, Dr. Benjamin Russ had already weakened confidence in the theory of humors by promoting solidism, which meant that for him there was only one disease.[36] His activities contributed to the demise of the humor theory, but in turn his views began to wane as American doctors flocked to Europe (1820–1840) and studied at the Paris Clinical School. There the dominant ideas were to correlate symptoms with pathology and complement the findings with experimentation and statistical analysis. One of the American physicians who went to Europe for training, Elisha Bartlett (1804–1855), condemned Russ for his outlandish ideas.[37] Added momentum came following Rudolph Virchow's epoch-making discoveries in cellular pathology and his assertion that all cells come from other cells (1855). This meant that diseases could be distinguished by anatomic changes as well as by clinical symptoms bringing greater rigour to diagnosis.[38] Pasteur, Koch, and others made landmark discoveries soon after, which meant that the ancient theory of humors was dead.[39] Even so, the new wave of discoveries relied on the biological and chemical sciences and on providing answers to the question of how symptoms produced by microbial infection were brought about. Many of these symptoms were

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[34] W. B. Johnson, "History of the Progress and Present State of Animal Chemistry," *The Critical Review, or, Annals of Literature* 4 (third series) (1804): 350–367. (London: J. Mawman, 1805).

[35] M. Andral, "On the Physical Alterations of the Blood and Animal Fluids in Disease," *Provincial Medical and Surgical Journal* (1840–1842) 2(35) (1841): 165–167.

[36] D'Elia, *op. cit*.

[37] R. H. Shyrock, "Changing Outlooks in American Medicine over the Centuries," *Sudhoffs Archiv für Geschichte der Medicin und der Naturwissenschaften* Bd. 37(H 3.4) (1953): 377–388; W. E. Stempsey, ed., *Elisha Bartlett's Philosophy of Medicine* (Dordrecht: Springer, 2005), 14–16.

[38] M. Schultz, "Rudolf Virchow," *Emerging Infectious Diseases* 14(9) (2008): 1480–1481.

[39] J. T. Patterson, *The Dread Disease: Cancer and Modern American Culture* (Cambridge, MA: Harvard University Press, 1987), 14, 15.

found to be caused by substances produced by microbes and in that sense constituted what some have called the modern theory of humorism.[40]

This hopefully places Ellen White's comments on humors in context. She was speaking of body fluids carrying disease organisms, as already indicated above. As we will see in the next section, the transition to the germ theory of disease was a difficult process for even some prominent scientists and medical people, let alone others. We still use the term humor and its derivatives in modern microbiology and medicine. For example, the specific or adaptive immune system in animals responsible for antibody production and other specialized functions often is referred to as humoral immunity. The antibodies produced by special cells are carried throughout the body in the lymph, blood, and body fluids—e.g., tears, saliva.[41] The gelatinous fluids in the eye are referred to as aqueous and vitreous humor.[42] The idea that White sought to communicate was that meat could carry the "seeds of disease" even in the liquids associated with these items of food.[43] In this science would agree.

The Meaning of Words

The meaning of words changes with time. I will attempt to interpret some contested words and ideas in the context of the times and then cast the information in the light of current knowledge. There is no better place to start than with leprosy.

Leprosy. Ellen White's words—"The eating of pork has produced scrofula, leprosy and cancerous humors"[44] have and continue to be promoted as the reason why pork should not be eaten and, on the other hand, are held up to derision because neither the leprosy bacillus nor ostensibly cancer-causing organisms capable of infecting humans have been found associated with swine's flesh. Before commencing the discussion, we make the significant observation that the above words were written in the context of the exodus experience. Notice that she quoted a significant Scripture (Deut 28:16–20) before the following statement is made: "It

[40] C. Richel, "An Address on Ancient and Modern Humorism," *British Medical Journal* 2(2596) (1910): 921–926.

[41] R. Coico and G. Sunshine, *Immunology: A Short Course*, sixth edition (Hoboken, NJ: John Wiley & Sons, Inc., 2009), 6, 20–24.

[42] R. P. McCall. *Physics of the Human Eye*. (Baltimore, MD: John Hopkins University Press, 2010), 62.

[43] White, *Counsels on Diet*, 386.

[44] White, *Spiritual Gifts*, 4a: 146.

[swine's flesh] would fill the system with humors, and in that warm climate also produced leprosy."[45] This means that the term leprosy used by her in this instance should be understood as it was at the time of the exodus. This will make a world of difference to our interpretation of her statements. [Note: I am not asserting that White never referred to the modern disease known today as leprosy in any of her writings.]

A simple reading of Leviticus chapter 13, associated with the exodus experience, will convince the alert reader that the term "leprosy" was not confined to a single disease. Medical historians and commentators concur with this conclusion.[46] There is no solid evidence that what we call leprosy today occurred in ancient Egypt, Mesopotamia, or Persia at the time of the exodus. The term used in Leviticus does not correspond with modern descriptions of the disease. True leprosy (lepromatous form) was first inadequately described in the second century AD and more thoroughly at a later date by Arab physicians. However, an English translation of the most important Arabic work was not available until 1856. The biblical term for leprosy (Hebrew transliteration: zaraath or tsaraath) was used in the Latin and English translations from ancient texts rather than the more descriptive Arabic term. The disease complex was referred to as "lepra," which meant a "scaly condition." This inevitably led to a wide range of skin disorders being referred to under the heading. The Arabs were the first to clearly recognise the loss of sensation associated with the classical modern disease, which is a defining characteristic.[47]

From early times the condition known as leprosy was considered contagious or even that some might be carriers but not express the disease. Frequent contact with or living together with a leper was considered prejudicial to infection. The living environment, particularly polluted air and food associated with lepers, were considered possible vehicles to convey the disease, but a bad diet, poor combinations of food items, or,

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[45] *Ibid*., 123–124.

[46] R. G. Cochrane, *Biblical Leprosy: A Suggested Interpretation*, second edition, (1963). Online: http://www.biblicalstudies.org.uk/article_leprosy_cochrane.html (15/10/2015); S. H. Horn, *Seventh-day Adventist Bible Commentary* (Washington, DC: Review and Herald Publishing Association, 1960), 8: 647–648; L. Ryken, J. C. Wilhoit and T. Longman, eds, *Dictionary of Biblical Imagery*. Article: "Leprosy" (Leicester, England: Inter-Varsity Press, 1998), 507.

[47] W. C. Brice, ed., *An Historical Atlas of Islam* (Leiden: Brill, 1981), 271–272; M. Meyerhof, "The 'Book of Treasure,' an Early Arabic Treatise on Medicine," *Isis* 14(1) (1930): 55–76.

indeed, certain foods like bear, ass or swine meat or even the milk of swine were also considered potentially responsible. The historian Tacitus (c. AD 56 to after 117) provided information that the Jews did not eat pork particularly since the animal was prone to infection by scabies (caused by the mite *Sarcoptes scabiei*), which gave rise to a scaly skin disease marked by intense itching. The word scabies was considered the same as leprosy by some, to be associated with it, or actually to be that disease initiated by scabies which subsequently turned lesions from black to white and then to red.[48] However, readers should be aware that White did not make this application, as she talked about conditions occurring after eating meat items, not after contact with animals.

The eighth edition of Bateman's synopsis on skin diseases published in 1836 admitted that there was much confusion about the meaning of the term "lepra." The first adequate description of the modern disease was provided in 1848 by Danielssen and Boeck and later confirmed by Hansen's description of the offending causal bacterium in 1874—the official modern meaning of the word leprosy commenced at that time.[49] None of the descriptions given by Bateman line up with the symptoms found with modern leprosy. One item of interest is that he described, in a footnote, the observation that those who lived largely on pork in Egypt suffered from a "leprous eruption" and were predisposing themselves to the disease.[50] The notion of eating leprous pork being associated with the disease of leprosy was fairly widespread and that from an early time. Plutarch (AD 45–120) expressed this idea and informed readers that pigs actually were infected with "leprous diseases" [note plural].[51] Writing in the *North American Magazine* (1834) on illustrations of the sagacity of the Mosaic laws, the author indicated that the prohibition on eating of pork by the Jews was on account of their fear of common leprosy (*lepro vulgaris*). Then he added,

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[48] I. M. Resnick, *Marks of Distinction: Christian Perceptions of Jews in the High Middle Ages* (Washington, DC: Catholic University of America Press, 2012), 113, 140–142.

[49] F. C. Lendrum, "The Name 'Leprosy,'" *American Journal of Tropical Medicine and Hygiene* 1(6) (1952): 999–1008.

[50] T. Bateman, *A Practical Synopsis of Cutaneous Diseases*, eighth edition (London: Rees, Orme, Brown, Green, & Longman, 1836), 34–39.

[51] L. Demaitre, *Leprosy in Premodern Medicine: A Malady of the Whole Body* (Baltimore, MD: John Hopkins University Press, 2007), 164, 166; C. Whitelaw, *The Scriptural Code of Health, with Observations on the Mosaic Prohibitions, and on the Principles and Benefits of the Medicated Vapour Bath* (London: C. Whitlaw, 1838), 61; M. Whittaker, *Jews and Christians: Graeco-Roman Views* (Cambridge: University of Cambridge Press, 1984), 6: 21.

this disease "is spreading to a fearful extent over a great part of the habitable globe,—particularly in the Portuguese Islands … and around most of the cities in England and America, where so much measly pork is eaten."[52]

What did writers regard as constituting leprous pork? Our last quote informs us unequivocally that it was "measly pork." Another clear answer is that leprous pig carcases in the Middle Ages were identified by looking at the tongues to see if they had suspected "measles." This represented pork tapeworm cysts that ulcerated the tongue. This food still could be sold in the mid-seventeenth century in France if the tongue was removed and the meat placed in brine.[53] Samuel Sidney's revised and edited book, originally produced by William Martin, on the pig was published in London in 1858. It reveals that measles was regarded by some as a mild form of leprosy that was caused by the parasitic worm. He noted that the symptoms were not restricted to the tongue; many watery pustules formed below the outer skin and on the surface they could appear as raised, reddish patches on the tender parts of the animal's body.[54] Perhaps one significant additional reference is *The Times* of October 3, 1863. This represented popular opinion in which measles in both pigs and humans was associated with *Taenia solium* (cysticercosis) infection. Cysticercosis was identified as being the most common and dangerous parasitic disease found in diseased meat being foisted on an unsuspecting public.[55] Even in recent times (1957), the condition known as "lepra" has been equated with pork measles or cysticercosis.[56] The later term refers to the larval stage of the tapeworm, which enters the tissues of the human host particularly the muscles, eyes, brain, and subcutaneous tissues. The symptoms that accompany the disease can include the development of visible nodules beneath the skin, which

[52] S. L. Fairfield, ed., "Modern Illustrations of Mosaic laws," *North American Magazine* 3 (1834): 434–436.

[53] M. Toussaint-Samat, *A History of Food*, second edition (South Gate, Chichester: John Wiley & Sons Ltd, 2009), 377.

[54] W. C. L. Martin, *The Pig: How to Choose, Breed, Feed, Cut Up, & Cure*, new revised edition by Samuel Sidney (London: G. Routledge & Co, 1858), 131–133.

[55] Anonymous, "Parasitic Diseases of Animals and their Effects Upon Man," *The Times (London)*, Saturday, October 3, 1863, 10.

[56] Z. M. Galang, ed., *Encyclopedia of the Philippines: Science* (Manila, Philippines: Exequiel Floro, 1957), 13: 339.

represent the reaction of the body to the offending parasite. The more serious side effects of the disease are epilepsy and dementia.[57]

This means that at least two diseases we can identify today were regarded at one time as representing leprous pork—pork tapeworm (measles) and scabies. And we might observe that possibly more would fall into this category if we still held to the vague definition of leprosy in vogue in many circles at an earlier time. This conceivably could even include the much talked about parasite *Trichinella* (granulomatous reactions occur and, in a minority of cases, it can cause a skin rash) and undoubtedly some swine-borne bacteria that form small nodules (granulomas) would qualify too.[58]

The parasite *Trichinella* was to spring into prominence following its naming (1835), the description of its life cycle by Rudolf Virchow in the late 1850s, and the definitive demonstration by Friedrich von Zenker in Germany (1860) that the worms present in pig meat could cause disease in humans.[59] Ellen White possibly had this organism and/or the larval stage of pork tapeworm in mind when (1905) she penned the words: "The tissues of swine swarm with parasites."[60] This disease was the subject of articles in the *Health Reformer*, newspapers, and scientific journals around the mid-1860s. In the former journal, readers were informed of outbreaks in various parts of the United States in the first year's edition (1866),[61] ostensibly in support of both Scripture and Ellen White's statement about pork eating. In the same year, *The Advent Review and Sabbath Herald*, with James White as

[57] Anonymous, "Taeniasis/Cysticercosis," World Health Organization, fact sheet 376, 2015. Online: http://www.who.int/mediacentre/factsheets/fs376/en/ (15/10/2015).

[58] F. Bruschi and K. D. Murrell, "New Aspects of Human Trichinellosis: The Impact of New *Trichinella* Species," *Postgraduate Medical Journal* 78 (2002): 15–22; J. Dupouy-Camet and F. Bruschi, "Management and Diagnosis of Human Trichinellosis," in *FAO/WHO Guidelines for the Surveillance, Management, Prevention and Control of Trichinellosis*, eds J. Dupouy and K. D. Murrell (Paris: World Organization for Animal Health, 2007), 36–68; Z. Hubálek and I. Rudolf, *Microbial Zoonoses and Sapronoses* (Dordrecht: Springer, 2011), 215, 241, 260–261.

[59] G. Blumer, "Some Remarks on the Early History of Trichinosis (1822–1866)," *Yale Journal of Biology and Medicine* 11(6) (1939): 586–588; R. Owen, "Description of a Microscopic Entozoan Infesting the Muscles of the Human Body," *Transactions of the Zoological Society of London* 1(4) (1835): 315–324; L. Z. Saunders, "Virchow's Contributions to Veterinary Medicine: Celebrated Then, Forgotten Now," *Veterinary Pathology* 37(3) (2000): 199–207.

[60] White, *Ministry of Healing*, 313.

[61] Anonymous, "Something for Pork-eaters," *Health Reformer* 1(1) (1866): 12–13; "Porcine," *Health Reformer* 1(5) (1866): 71.

president of the publishing Association, featured a piece on meat eating. The article was focused on the practice of eating swine and gave great emphasis to the trichina (*Trichinella*); nothing was said about leprosy.[62] Today we note that the disease may be transmitted by other unclean meats too, such as horse and dog flesh.[63]

White's statement about leprosy being transmitted from pigs to humans must be thought of in terms of the ancient biblical description of the term where a variety of diseases were involved. Her statements present no difficulty when this is done and correspond with the information and dominant thoughts circulating in her day. The continual use of the health vision material by editors and compilers, while Ellen White was alive, without updating (except for minor editorial changes), is noted even up until 1914.[64] However, when new material was written she moved to place the principles revealed in the health vision in the context of advancing science and peoples' reaction to the information, as evidenced by the extensive treatment of the same subject material in *Ministry of Healing* (first published in 1905). Along these lines, I suggest that she already had indicated that her earlier reference (1864) to leprosy in relation to pork was to be correctly understood as parasites (and other fatal diseases—see below) that might be found in pork flesh. Consider the evidence: "The eating of pork has produced scrofula, leprosy and cancerous humors. Pork-eating is still causing the most intense suffering to the human race"—(1864). And "People are continually eating flesh that is filled with tuberculous and cancerous germs. Tuberculosis, cancer, and other fatal diseases are thus communicated. The tissues of the swine swarm with parasites"—(1905).[65]

Her statements on leprosy/parasites indicate that adherence to the Edenic diet will prevent acquisition of such diseases. A major theme raised by White concerning the consumption of pork was God's restriction on its use on the basis of the gross nature of the feeding habits of swine, which influenced the disease burden carried (swine were fed human faeces, garbage, and abattoir offal). God is the author of health and happiness and we can be sharers in the blessings of health if we follow His instructions. White was calling readers back to the instruction already given in the Bible.

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[62] Anonymous, "Shall We Eat Meat?" *Advent Review and Sabbath Herald* 27(25) (1866): 193–194.

[63] Bruschi and Murrell, *op. cit*.

[64] E. G. White, "Early Counsels on Medical Work—no. 1," *Advent Review and Sabbath Herald* 91(14) (1914): 3, 4.

[65] White, *Ministry of Healing*, 313; *Spiritual Gifts*, 4a:146.

Tuberculosis and Scrofula. As indicated previously, White asserted that "The eating of pork has produced scrofula…."[66] First, we must understand what the word scrofula referred to and whether it can be transmitted to humans through eating animal products.

Before the recognition of the causal agent of tuberculosis, considerable uncertainty existed regarding the relationship among different diseases such as consumption (tuberculosis) and scrofula. Some held both these conditions were synonymous even in the early part of the nineteenth century.[67] However, agreement was far from unanimous. Finally, the link between the diseases was shown experimentally in 1888 in well executed experiments.[68]

The disease known in modern terms as tuberculosis (consumption) was suspected of being contagious by Hippocrates (c 460–370 BC) and Galen (AD 162–217), who were accomplished early physicians. However, it was not experimentally shown to be so until 1865. The causal organism was found to be a bacterium in 1882 by the German scientist Robert Koch. He published a full account of his discovery two years later, but the great scientist did not consider bovine tuberculosis of great danger to humans, although he recognized that it was transmissible to them from cattle. He held this position even until 1908, although other authorities differed and they recommended milk be pasteurized (1911).[69]

Some thirty years before the time of Ellen White's writings of 1864/5, scrofula was recognized by some authorities as a disease characterized by the enlargement of glands, swelling of the joints, ulceration of the skin, and damage to the bones,[70] but around the time of writing it was refined by the more particular to represent the slow enlargement of the lymphatic glands particularly of the neck, characterized by non-purulent discharge, and which remained open and discharged serum and became fistulous. Scrofula was regarded by some as a form of tubercular disease by the mid-1860s to

[66] White, *Spiritual Gifts*, 4a: 146.

[67] J. Kent, *Observations on the Causes, Symptoms, and Nature of Scrofula or King's Evil, Scurvy, and Cancer* (Bellevue, WA: Emptitude Books, 2009), 10. [First published in 1833.]

[68] F. S. Eve, "On the Relationship of Scrofulous Gland Disease to Other Forms of Tuberculosis: An Experimental Enquiry," *British Medical Journal* 1(1424) (1888): 788–790.

[69] Sakula, 1983, *op. cit*.

[70] Anonymous, "What Is Scrofula?" *British Medical Journal* 1(481) (1870): 290, 291.

1870.[71] Its relationship to consumption (tuberculosis) was recognized in the denominational magazine *Good Health* in 1881.[72]

In making a statement about the transmissible nature of scrofula, White was making a claim that was commonly repeated, particularly in the United States. For example, Dr. J. C. Lugol of St. Louis Hospital held (around 1840) that transmission was undeniable; in fact the disease was hereditary in his opinion. Even though scrofula's link to tuberculosis was suspected, it was not proven. And the contagious nature of scrofula was not well supported by experimentation.[73] Opinions expressed were based on observations, which were of sometimes doubtful rigour. Besides familial predisposition to disease, other predisposing factors, including nutrition, were mentioned. But no particular item of food was singled out as aiding in the development of the disease.[74]

This leaves us in the position of saying that many ideas about scrofula (tuberculosis) were in vogue in the 1860s. No particular claim of priority can be attributed to Ellen White for her statements. However, it is rather remarkable that her general statements about scrofula turned out to be correct including the transmission of the disease from mother to infant, which she seemed to imply was even possible *in utero*.[75] Many prominent individuals of her time singularly failed to convey quality information and made ridiculous claims when viewed in the light of modern science. The primary claim that the use of pork was one avenue through which the disease could be transmitted has been convincingly shown. It now is acknowledged that two species of the tuberculosis bacterium are capable of causing the disease and both may arise in domestic or wild pigs and be

[71] Anonymous, "Questions and Answers," *The Health Reformer* 1(1) (1866): 12; J. P. White, "Pathology of Pulmonary Pthiasis," *Bulletin of the New York Academy of Medicine* 4 (1870): 153–166.

[72] Anonymous, "Scrofula or King's Evil," *Good Health* 16(11) (1881): 346–349.

[73] Anonymous, "Physiology in Regard to the Laws of Increase, and the Influence of Parents on Offspring [Scrofula and Consumption]." *Journal of Health and Disease* 1 (1846—presented November 1845): 113–123.

[74] R. T. Evanson and H. Maunsell, *Practical Treatise on the Management and Diseases of Children*, second American edition (Philadelphia, MD: Ed Barrington & Geo. D. Haswell, 1843), 343; White, 1870, *op. cit*.

[75] O. M. Loto and I. Awowole, "Tuberculosis in Pregnancy: A Review," *Journal of Pregnancy* 2012, article ID 379271. Online: http://dx.doi.org/10.1155/2012/379271 (15/10/2015); E. G. White, *A Solemn Appeal* (Battle Creek, MI: Seventh-day Adventist Publishing Association, 1870), 122; E. G. White, "Words to Christian Mothers on the Subject of Life, Health, and Happiness—no. 3," *Advent Review and Herald of the Sabbath* 38(20) (1871): 154–155.

acquired through eating under-cooked meat. One form found in pigs is known as Johne's disease, which is contracted particularly following feeding them with poultry litter.[76]

White's capacity of providing sound information also was noted when it came to advice concerning protection against disease acquisition. While the scientific community debated the seriousness of the bovine form of tuberculosis and the advisability of pasteurization, Ellen White recommended that milk be boiled (1896) or thoroughly sterilized/cooked (1901, 1905) and taken from healthy animals,[77] although it is fair to say that on account of the context of her statements and/or the scientific discussion of the times no particular amazing doctrine can be attributed to her. However, getting it right called for more than human inspiration, especially since the great Robert Koch was a negative force concerning the idea of serious transmission of bovine tuberculosis via milk. At the London Congress on Tuberculosis in 1901, caution was advised regarding consumption of meat, milk, and butter. Even so Koch announced his reservations about the benefits of taking measures against contracting tuberculosis from cattle.[78] Since he considered bovine tuberculosis only rarely contactable by humans, it follows that pasteurization and other measures would have been considered superfluous to him.

By the end of the nineteenth century the scientific evidence was pointing to the importance of milk as a vehicle of disease. The movement to ensure a clean milk supply was alive in both America and England in 1901. Indeed, legislation was enacted in 1885 and 1890 in England in an attempt to improve the situation; but very little changed as a result. No national effort to effectively control the supply of milk took place until after World War I. British scientists had shown in 1888 that tuberculosis could be transmitted to humans through cows' milk, but any momentum was halted when Robert Koch declared in 1901 that risk in that area was minimal. Added to this pressure was the weight of commercial and political interests. This meant

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[76] H. B. Gelberg, "Alimentary System and the Peritoneum, Omentum, Mesentery, and Peritoneal Cavity," in: *Pathologic Basis of Veterinary Diseases*, eds J. F. Zachary & M. D. McGavin, fifth edition (St. Louis, Missouri: Elsevier Mosby, 2012), 322–404; Hubálek and Rudolf, *op. cit*., 253–256.

[77] White, *Counsels on Diet,* 209–211, 357, 432; *Ministry of Healing*, 302.

[78] R. Koch, "An Address on the Fight Against Tuberculosis in the Light of the Experience That Has Been Gained in the Successful Combat of Other Infectious Diseases," *British Medical Journal* 2(2117) (1901): 189–193.

that in Britain pasteurization did not become obligatory until 1948.[79] In the United States there were two competing voices. Nathan Straus advocated pasteurization (1893) whereas Henry Coit advocated "certified raw milk" and was instrumental in creating a strong anti-pasteurization movement. The positive outcome was that both parties contributed to the hygienic presentation of milk. The urgency of undertaking constructive reforms was emphasized by the definitive investigations carried out by the highly respected Hallock Park of New York city (professor at the university and assistant director of the Research Laboratory of the Department of Health). He gave graphic descriptions of the unhygienic conditions of dairies and followed this with actual bacterial counts recorded in the milk. As a consequence, New York City looked to providing milk with lower bacterial counts in legislation enacted in 1901. In 1908 Chicago passed the first legislation prohibiting raw milk sales. But the first state-wide legislation did not take place until 1947 and it took longer for the national sale of raw milk to be forbidden or restricted (since 1960).[80] Hence, White's statements were both timely and potentially life-saving for a considerable period for those prepared to take her word. They are still relevant today in many parts of the world.

The same fundamentals and principles highlighted under leprosy were re-emphasized under tuberculosis with additional emphasis being given to animal products such as milk. However, White also made general reference to the benefits of fresh air and sunlight as being powerful adjuncts to maintaining health.[81] Knowledge that airborne transmission of tuberculosis was possible was known early (1882) and recent studies again have shown this to be the case. The survival of the organism is enhanced under cold, dark, and moist conditions and particularly in the absence of sunlight.[82]

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[79] C. A. Nathanson, *Disease Prevention as Social Change* (New York: Russell Sage Foundation, 2007), 68–69.

[80] A. Mendelson, "Milk: Raw Milk," in *The Oxford Enclyclopedia of Food and Drink in America*, vol. 1, second edition, eds A. F. Smith and B. Kraig (Oxford: Oxford University Press, 2013), 588–590; W. H. Park, "The Great Bacterial Contamination of the Milk of Cities. Can It Be Lessened by the Action of Health Authorities?" *Journal of Hygiene (London)* 1(3) (1901): 391–406.

[81] White, *Selected Messages*, 2: 460, 462.

[82] Anonymous, "Contagiousness of Consumption," *Good Health* 17(8) (1882): 246; Anonymous, "Bovine Tuberculosis." Iowa State University (2009). Online: http://www.cfsph.iastate.edu/Factsheets/pdfs/bovine_tuberculosis.pdf (15/10/2015); I. N. de Kantor, P. A. LoBue and C. O. Thoen, "Human Tuberculosis Caused by *Mycobacterium bovis* in the United States, Latin America and the Caribbean," *International Journal of*

None of these factors were understood experimentally until after Koch cultured the offending bacterium. This means that White clearly was ahead of the scientific information circulating at the time.

Cancer. Cancer was a well-known disease in Ellen White's time. She did not fail to address one of its possible causes (meat eating), as I will note shortly. However, such ideas had been expressed (without clear proof) previous to 1865. For example, Dr. Burkholder of Chicago expressed the opinion around the turn of the nineteenth century that cancer present in meat was probably a source of cancer in humans. Similar conclusions on transmissibility were being made in the United Kingdom and elsewhere from a survey of the eating habits of individuals. Others thought that the Jews largely avoided the disease because they subscribed to the Mosaic code.[83] However, the proof of a link between food items and cancer acquisition was yet to come. For the lower animal kingdom, it came with the discovery (1936) of a tumor agent of mice capable of inducing breast carcinoma. When extracts were prepared from these tumors and fed to mice, they developed tumors in turn, a result also obtained when pups suckled on their diseased mothers.[84] The agent was subsequently described as a virus.

The question was still unresolved whether similar findings might explain the occurrence of selected human cancers. Of interest is that some animal and human viruses can be transferred within the species concerned (and occasionally across genera). For instance, in humans, mother to foetus, organ donor to recipient transfer, and surgical mishap transfer is well known. And there are other possibilities.[85] However, the much debated question about food items of animal origin to recipient transmission is unresolved, but there are clues that this may be a reality.

Tuberculosis and Lung Disease 14(11) (2010): 1369–1373.

[83] J. H. Kellogg, "Meat Eating a Cause of Cancer," *Good Health* 35(12) (1900): 672–674.

[84] J. J. Bittner, "Some Effects of Nursing on the Mammary Gland Tumor Incidence in Mice," *Science* 84(2172) (1936): 162; J. J. Bittner, "The Milk-influence of Breast Tumors in Mice," *Science* 95(2470) (1942): 462–463.

[85] American Cancer Society, "Viruses That Can Lead to Cancer." 2015. Online: http://www.cancer.org/cancer/cancercauses/othercarcinogens/infectiousagents/infectious agentsandcancer/infectious-agents-and-cancer-viruses (16/10/2015); J. S. Welsh, "Contagious Cancer," *The Oncologist* 16(1) (2011): 1–4; L. Gross, "The Role of Viruses in the Etiology of Cancer and Leukemia in Animals and in Humans," *Proceedings of the National Academy of Sciences USA* 94 (1997): 4237–4238.

Microbial Agents Inducing Cancer

Finding cancer associated with specific microorganisms or entities would be the first step in finding a cure. We notice that from early times cancer was linked putatively to tuberculosis (bacterial) infection (1772) because carcinomas occurred more frequently in areas of pulmonary tissue scarring. The theory about bacterial predisposition to cancer was subsequently abandoned for a time.

The involvement of viruses in the appearance of cancer took many years to establish. Although the transmissibility of cervical cancer through sexual contact was suspected by Rigoni-Stern in Italy as early as 1842, it took another 140 years to provide the proof that a virus was involved.[86] Our search for answers to the possibility of there being cancer "germs" (White's term for the inciting agent) will look at a number of microbial agents. We should not expect that all agents identified will be directly responsible for cancer. The agents may simply contribute to the development of the disease.

The flurry of excitement about bacterial diseases naturally started a serious debate about the cause of cancer. Cancer, much as we know it today, particularly breast cancer, was recognized from ancient times. Around the turn of the nineteenth century, some scientists predicted that it would not be long before cancerous germs/microbes/protozoa would be found after the establishment of the germ-theory of disease.[87] However, the most interesting microbial entities (viruses—non-living) are generally beyond the ability to visualize using a light microscope. The term virus first was used in a rather unpredictable manner.[88] In fact, the term has been in use from ancient times and has changed its meaning too. The most common usage was to a "mysterious unknown agent" or, in the late nineteenth century, it represented an "agent with infectious properties."[89] Since viruses were not seen until the electron microscope was invented (first publication of an

[86] G. zur Hausen, "The Search for Infectious Causes of Human Cancers: Where and Why," *Angewandte Chemie International Edition* 48(32) (2009): 5798–5808.

[87] H. L. Browne, "The Modern Development of the Germ Theory," *British Medical Journal* 2(1752) (1894): 176; C. H. Cattle, "Remarks on the Etiology of Cancer," *British Medical Journal* 1(1738) (1894): 851–852; J. Paget, "The Morton Lecture on Cancer and Cancerous Diseases," *British Medical Journal* 2(1403) (1887): 1091–1094.

[88] Anonymous, "The Contagiousness of Consumption," *Good Health* 17(1) (1882): 24–25; J. N. Loughborough, "Diseases and their Treatment," *Health Reformer* 2(6) (1867): 81–83; Morton, *op. cit*.

[89] L. N. Magner, *The History of Medicine* (New York: Marcel Dekker, Inc., 1992), 328.

image in 1940), it is understandable that some diffuseness existed about the use and meaning of the word.[90]

The discovery that cell-free extracts/agents (containing virus particles) could be used to transfer oral warts between dogs was reported in 1898 and transmissibility of human warts was shown nine years later. The demonstration that leukaemia (not recognised as cancer at that time) in chickens could be transferred in cell-free filtrates was highlighted by Ellerman and Bang in 1908 and similarly a solid tumour in chickens was transmitted by Peyton Rous in 1911. These were landmark events that were not recognised as such at the time because no agent could be seen. Much later (55 years) Rous received the Nobel Prize on account of the robustness and significance of his experiments. Rous was able to show that a cell free extract prepared from a solid tumour of a sick chicken was able to induce disease in healthy birds.[91] Viruses causing cancers of humans were discovered in the next quarter of a century and the list still is growing.[92] To this list of inciting or potential inciting agents have been added bacteria (4) and parasites (3). Even so, only around 20 percent of all cancers have a known infectious etiology.[93]

Cancer Transmission in Food

The public in White's time, as now, tends to react when there is clear proof of disease transmission from animals, but not on the basis of philosophical arguments. Arguments of the latter kind were put by Thomas Tryon. He advocated a vegetarian diet (1697) in accordance with the Creator's design, and on account of the disease burden carried by animals and the putrefaction issues experienced with meat.[94]

It was well recognized early, at least in some official circles, that specific diseases were transmitted through meat coming from affected animals. This realization came particularly after the discovery of the

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[90] D. H. Kruger, P. Schneck and H. R. Gelderblom, "Helmut Ruska and the Visualisation of Viruses," *Lancet* 355(9216) (2000): 1713–1717.

[91] G. B. Faguet, *The War on Cancer: The Anatomy of Failure, A Blueprint for the Future* (Dordrecht: Springer, 2005), 35; M. E. McLaughlin-Drubin and K. Munger, "Viruses Associated with Cancer," *Biochimica et Biophysica Acta* 1782(3) (2008): 127–180; Wagener, *op. cit.*, 39.

[92] R. T. Javier and J. S. Buteldoi, "The History of Tumor Virology," *Cancer Research*, October 1, 2008, 68; 7693. doi: 10.1158/0008-5472.CAN-08-3301

[93] Welsh, *op. cit*., 1; zur Hausen, *op. cit*.

[94] Anonymous, "Trichinae in Meat," *Science* 2(52) (1881): 298–299: B. W. Ball, *The English Connection* (Cambridge: James Clarke, 1981), 176.

Trichinella parasitic roundworm (1855) and the recording of significant outbreaks in Germany (1860–1876—thirteen outbreaks) among the human population. However, the issue of gaining legislative power to regulate the meat trade and then gain compliance for the prevention of this and other diseases was another matter.[95]

We have observed already that several meat-associated parasitic diseases were known by the time of the health vision. These organisms could be seen under the microscope and it was relatively easy to establish the infection link. However, linking cancer transmission with meat eating would entail identifying the entity responsible and then establishing its ability to cause cancer in both animals and humans. This evidence was not available in White's time.

Today a number of bacteria, viruses, and other agents have been linked to cancer development,[96] which means our quest for a satisfactory answer to White's assertion must necessarily be broad. She said (1905—essentially given in 1901 too): "People are continually eating flesh that is filled with tuberculosis and cancerous germs. Tuberculosis, cancer, and other fatal diseases are thus communicated." This represents an updated statement following the one she made in 1865.[97]

I have already indicated that some cancers are transmissible, but many do not appear to be. The evidence on transmissibility of microbes capable of predisposing to cancer is as follows:

Bacteria. A number of bacteria (four) capable of causing chronic inflammation have been associated with cancers (lymphomas). These typically regress when antibiotic treatment is given.[98] *Campylobacter* is one of these and is part of the normal flora of cattle, poultry, and pigs. Long lasting infections can occur in human beings.[99] *Campylobacter jejuni* is the predominant species infecting human following consumption of meat from the above animals, and is one of the prominent human diseases arising from

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[95] Anonymous, "Trichina Epidemics, *British Medical Journal* 2(875) (1877): 492–493; P. Manby, "Meat Inspection and the Abolition of Private Slaughterhouses," *British Medical Journal* 2(2018) (1899): 581–584.

[96] G. Trinchieri, "Cancer and Inflammation: an Old Intuition with Rapidly Evolving New Concepts," *Annual Review of Immunology* 30 (2012): 677–706.

[97] White, *Ministry of Healing*, 313.

[98] R. F. Schwabe and C. Jobin, "The Microbiome and Cancer," *Nature Reviews Cancer* 13 (2013): 800–812.

[99] A. Gallay, V. Prouzet-Mauléon and F. Mégraud, "*Campylobacter* Antimicrobial Drug Resistance Among Humans, Broiler Chickens, and Pigs, France," *Emerging Infectious Diseases* 13(2) (2007): 259–266.

animals worldwide.[100] The organism is the cause of widespread illness even in the developed world. The majority of infections arise from farmed animals (cattle, sheep, poultry, and pigs). In a study in England, cattle, and poultry were the most significant sources of the bacterium.[101] However, it is known that the organism commonly colonizes the colon of pigs, particularly in commercial enterprises, and these animals are a good model of how the organism affects humans. Infections are characterized by an inflammatory response and it is this very response that is responsible for a variety of inflammatory bowel diseases.[102]

This bacterium is able to increase breaks in the genetic material in host cells leading to an increased risk of some cancers. Tests have established an association of one form of cancer (lymphoma) in the human small intestine with bacteria. A majority of patients with this cancer yielded *C. jejuni*.[103] However, the patient numbers were small, which means that stronger evidence is required to convince some experts. Others already accept this bacterium as capable of predisposing to cancer development. It is interesting to observe that evidence implicating our target bacterial genus and others continues to mount.[104]

We note that White extended her initial statement relating to eating of pork being connected with cancer to include meat in general. This observation is an important point to keep in mind as we broaden our inquiry.

The bacterium *Helicobacter pylori* was discovered relatively recently (1983) and is able to predispose to carcinoma through the chronic

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[100] Hubálek and Rudolf, *op. cit*., 232.

[101] D. J. Wilson, E. Gabriel, A. J. H. Leatherbarrow *et al*., "Tracing the Source of Campylobacteriosis," *Plos Genetics*, September 2008. doi: 10.1371/journal.pgen.1000203

[102] L. D. Cunningham, *Evaluation of Proinflammatory Cytokines in Pigs Infected with* Campylobacter jejuni *and* Trichuris suis (PhD thesis, Michigan State University, 2007), 77–80; L. D. Kalischuk and A. G. Buret, "A Role for *Campylobacter jejuni*-induced Enteritis in Inflammatory Bowel Disease?" *American Journal of Physiology—Gastrointestinal and Liver Physiology* 298(G1–G9) (2010). doi:10.1152/ajpgi.00193.2009

[103] M. Lecuit, E. Abachin, A. Martin *et al*., "Immunoproliferative Small Intestine Disease Associated with *Campylobacter jejuni*," *New England Journal of Medicine* 350(3) (2004): 239–248.

[104] K. Alibek, A. Bekmurzayeva, A. Mussabekova *et al*., "Using Antimicrobial Adjuvant Therapy in Cancer Treatment: a Review," *Infectious Agents and Cancer* 2012, 7: 33. doi:10.1186/1750-9378-7-33; zur Hausen, *op. cit*.; R. L. Warren, D. J. Freeman, S. Pleasance *et al*., "Co-occurrence of Anaerobic Bacteria in Colorectal Carcinomas," *Microbiome* 2013 1: 16. doi:10.1186/2049-2618-1-16; Welsh, *op. cit*.

inflammation it can induce in the stomach. It is classified as a carcinogen by the International Agency for Research on Cancer.[105] The reservoir of this organism, apart from humans, is still debated. It has been reported in various animals including cows and sheep, but showing identity with the species found in humans has been problematic. Recent results based on genetic sequence analysis seem to confirm its presence in sheep and cows. This is in agreement with data that appear to show that its incidence is higher among individuals associated with domestic (and other) animals, particularly when contact is with their natural (raw milk) or slaughter products.[106]

Closely related species of bacteria have been found in a variety of animals and some of these have been isolated from humans. For example, it is thought that pigs represent the most likely source of infection in humans by *Helicobacter suis*. Some of these infections can lead to the formation of lymphomas. The routes by which these organism travel from animals to infect human beings remains unresolved but carriage in poorly prepared meat is a possibility.[107]

Viruses. I have noted already that there are well established links between selected viruses and cancer development. In searching for a link between viruses in food items and cancer, my initial emphasis will be on pork, for the simple reason that White mentioned it in her first statement concerning the origin of some cancers. However, if we find the link with any of the popular meat items, I think the essential question will have been answered.

There is a sentiment circulating that cancer is so rare in pigs that White's statement must be judged false automatically. This may be a

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[105] Schwabe and Jobin, *op. cit*.

[106] M. M. Khalifa, R. R. Sharaf and R. K. Aziz, "*Helicobacter pylori*: a Poor Man's Gut Pathogen," *Gut Pathogens* 2010, 2:2. doi: 10.1186/1757-4749-2-2; F. Mégraud and N. Broutet, "Have We Found the Source of *Helicobacter pylori*?" *Alimentary Phamacology and Therapeutics* 14(s3) (2000): 7–12; H. Momtaz, H. Dabiri, N. Souod and M. Gholami, "Study of *Helicobacter pylori* Genotype Status in Cows, Sheep, Goats and Human Beings," *BMC Gasteroenterology* (2014) 14: 61. doi: 10.1186/1471-230X-14-61.

[107] F. Haesebrouck, F. Pasmans, B. Flahou et al., "Gastric Helicobacters in Domestic Animals and Nonhuman Primates and their Significance for Human Health," *Clinical Microbiology Reviews* 22(2) (2009): 202–223; A. V. Singhal and A. R. Sepulveda, "*Helicobacter heilmannii* Gastritis: A Case Study with Review of Literature," *American Journal of Surgical Pathology* 29(11) (2005): 1537–1539.

considerably overstated position, particularly with some breeds of pigs.[108] There are at least ten viruses of swine that cause known diseases in humans.[109] At the present time, two virus groups found in swine are close relatives to known cancer inducing viruses in humans.[110]

The 2008 Nobel Prize winner Harald zur Hausen has indicated several lines of evidence pointing to the likelihood that animal food items can act to transmit cancer-producing viruses. The possible involvement of bovine viruses in cancer development perhaps is indicated by the occurrence of malignant tumours at the site of smallpox vaccination years after the event. The vaccines used were prepared in calves and the virus preparation is known to enhance the presence of some viruses carried in this animal, particularly polyoma-type viruses. It is conceivable that the vaccine was contaminated with such viruses, although other explanations are possible. Another strand of evidence is that a number of human viruses are cancer producing when inoculated into animals, but the reverse is difficult to prove for ethical reasons. Indirect evidence indicates that contact with cattle and the use of their products is a risk factor for some childhood leukaemias. This suggests a native cattle virus could be responsible. Similarly, animal viruses may play a role in colorectal cancer apart from the chemical carcinogens formed during preparation of meat products. For example, there are correlations between red meat consumption, particularly undercooked meats, and colorectal cancer. This is compatible with the idea that viruses could be involved.[111] It will be fascinating to follow the developments in this field.

Health Principles Highlighted

Ellen White was adamant that the principles of health could be understood and that it was the duty of Christ's followers to seek a thorough understanding of them, to keep advancing in knowledge, and be leaders in

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[108] S. J. Newman and B. Rohrbach, "Pot-bellied Pig Neoplasia: A Retrospective Case Series (2004–2011)," *Journal of Veterinary Diagnostic Investigation* 24(5) (2012): 1008–1013.

[109] Hubálek and Rudolf, *op. cit*., 145–193.

[110] B. Karsten Tischer and Nikolaus Osterrieder, "Herpesviruses—a Zoonotic Threat?," *Veterinary Microbiology* 2010 January 27; 140(3–4): 266. doi: 10.1016/j.vetmic.2009.06.020; D. C. Edelman, "Human Herpesvirus 8—A Novel Human Pathogen," *Virology Journal* 2 (2005): 78. doi: 10.1186/1743-422X-2-78

[111] zur Hausen, *op. cit*.; H. zur Hausen, "Red Meat Consumption and Cancer: Reasons to Suspect Involvement of Bovine Infectious Factors in Colorectal Cancer," *International Journal of Cancer* 130(11) ((2012): 2475–2483.

matters of health in their communities.[112] Advances in knowledge of health principles did not cease in White's day. It is our privilege to look back at the period of turmoil in the biological sciences that marked the era in which the health vision was given and rejoice at the principles identified. These are still applicable. The added advantage for those living in the twenty first century is that the scientific world has identified additional principles that are helpful. White advised us to listen to this source of information.[113] In our quest to treat the human body as an edifice designed by God, we do well to respect this information, and practice the principles of health in our daily lives.

The main ideas identified here as relating to transmissible diseases and risk minimization are as follows:

• Specific diseases are transmissible from animal and other humans.

• Selected diseases can be transferred from mother to infant *in utero*.

• Meats and animal-derived products frequently are the source of infectious agents and possibly some are responsible for cancer development.

• Heat treatment of animal-derived products reduces the risk of disease transmission.

• Maintenance of hygienic conditions in the food supply chain is essential to disease risk reduction.

• Destruction of microbes is enhanced when exposed to light and dry, well-aerated environments.

• Immunization against transmissible diseases can reduce the risk of acquisition.

Concluding Remarks

The task of understanding writings from 100 or more years ago can be challenging at best, for both the scientific and English languages have changed over the period. A systematic approach to Ellen White's statements on health, particularly in the physical realm, has shown that her words need not be misunderstood and are as sound today as when they were given. She conveyed a profound sense of reverence for God's word and His instructions on health. Her statements were meant to amplify the principles contained in the Scriptures. I could find no evidence of deficiency in either source. The claim that modern science has discounted her views on such

[112] White, *Counsels on Diet*, 24.

[113] E. G. White, *Counsels on Health* (Mountain View, CA: Pacific Press Publishing Association, 1951), 566.

things as leprosy[114] is inaccurate. White was more aware of things happening in her day than some modern-day writers are and she possessed a scientific awareness sometimes far in advance of her day, as demonstrated by the evidence given here. She moved in a plane entirely different from others, as is amply demonstrated by reading selected articles in the health and scientific journals of her day written by people considered to be experts.

White's statements were both timely and potentially life-saving for a considerable period after they were first penned for those prepared to take her word. Her warnings on health are still highly relevant in emerging countries and her counsel more generally is applicable to all. Her example of accepting immunization was exemplary and indicates her forward looking approach. Understanding her statements on physical health and the soundness of the advice, as illustrated in this article, opens the way for her instructions on moral principles and spiritual health to be taken seriously.

Her continuing challenge to readers is to reason from cause to effect in their efforts to achieve optimum health.[115] Today, modern science has moved rather vigorously into this territory. This means that the principles of health are more clearly understood now than in any period of earth's history. Putting these principles into action, especially when coming from a biblical perspective, will enable optimum health to be achieved within the genetic constraints that all possess. The attainment of this objective is for the ultimate purpose of clarity of thinking. This is necessary for the best endeavours in the spiritual domain, so enabling believers to develop a robust spiritual life, but also to be attractive ambassadors of God's grace in the closing period of world's history—the time for the sounding of the three angels' messages.

Part 2 will consider White's advice in the area of life-style diseases, which have replaced transmissible diseases in significance in many areas of the world.

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[114] G. Bradford, *Prophets Are Human* (Warburton, Victoria: Signs Publishing Company, 2004), 64.

[115] White, *Selected Messages* 2: 469, 471.

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