Environmental Stewardship and Economic Prosperity

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The purpose of the "Our Stewardship" conference held at Brigham Young University on February 27–28, 2004, was to have scholars bring their academic experience and expertise to bear on the relationship between Latter-day Saint theology and environmental stewardship. This chapter will focus on new theories of wealth management coming from systems ecologists rather than from conventional economists. The new theoretical framework, known as Energy Systems Theory, provides a much more comprehensive framework for thinking about how to best organize human economic activities. The theoretical framework is more compatible with gospel principles than the narrower framework of modern economic theory.

Wendell Berry, noted Christian ecologist, has stated that the current thinking about economics is too narrow to provide the guidelines for those desiring to rescue God's creations. He describes the modern industrial economy as being (1) not comprehensive enough, (2) destructive of that which it does not comprehend, and (3) dependent on what it does not comprehend.

For emphasis, he refers to man's industrial economy as the "Little Economy," and he defines the larger economy, including the things that God has created as a foundation of the human economy, as the "Great Economy."[1] The importance of energy systems theory is that it provides a comprehensive framework that can enable us to learn how to organize our economic activities so that we minimize the harm done to the Great Economy, the foundation for the little human economy.

Section 1 of the paper draws from writings of ancient and modern prophets to describe the Great Economy. Section 2 describes energy accounting

tools that provide the necessary decision-making information to operate within the Great Economy. Section 3 extends principles of economic strategy designed for the Little Economy to principles suitable for operating in the Great Economy. Section 4 provides some specific examples of applications of the tools and concepts of the Great Economy and shows how these principles lead to a stable form of prosperity. The concluding section shows how environmental stewardship is ultimately a moral choice, requiring an important shift of heart and mind. This section concludes with a discussion of how stewardship, rather than sustainability, is the appropriate goal for a religion-based environmental movement.

1. Foundation of Wealth in the Great Economy

Ancient as well as modern prophets have taught clearly that God provides the source and foundation of all wealth for all human activities. For example, in a revelation given to the Prophet Joseph Smith in Doctrine and Covenants 59, the Lord declares:

> Yea, all things which come of the earth, in the season thereof, are made for the benefit and use of man, both to please the eye and to gladden the heart;
>
> Yea, for food and for raiment, for taste and for smell, to strengthen the body and to enliven the soul.
>
> And it pleaseth God that he hath given all these things unto man; for unto this end were they made to be used, with judgment, not to excess, neither by extortion.
>
> And in nothing doth man offend God, or against none is his wrath kindled, save those who confess not his hand in all things, and obey not his commandments. (D&C 59:18–21)

The warning to use these things with judgment, not to excess, neither by extortion is central to our care and stewardship of the gifts of the good land that have been provided for us. The concept of the gift of the good land originates in the writings of Moses in the eighth chapter of Deuteronomy. In the early part of the chapter, the Lord reminds the Israelites that He provided for them for forty years in the wilderness and then led them to "a good land, a land of brooks of waters, . . . of wheat, and barley, . . . iron [and] brass" (Deuteronomy 8:7–9). He provided for their sustenance and asks only that they remember Him and keep His commandments. He chastises those who forget Him and say in their hearts, "My power and the power of mine hand hath gotten me this wealth" (Deuteronomy 8:17), and urges them to "remember the Lord thy God: for it is he that giveth thee power to get wealth" (Deuteronomy 8:18).

The choice of words in the final quote from Deuteronomy is interesting. The Lord does not provide wealth for man, but rather He provides the power to get wealth. As we will see in later sections, energy systems theory focuses on the processes that provide the power to produce wealth rather than on products created by wealth.

In modern times, President Spencer W. Kimball expressed concern that we as a people were straying from revealed principles by putting our faith in the material things of the world:

> Few men have ever knowingly and deliberately chosen to reject God and his blessings. Rather, we learn from the scriptures that because the exercise of faith has always appeared to be more difficult than relying on things more immediately at hand, carnal man has tended to transfer his trust in God to material things. Therefore, in all ages when men have fallen under the power of Satan and lost the faith, they have put in its place a hope in the "arm of flesh" and in "gods of silver, and gold, of brass, iron, wood, and stone, which see not, nor hear, nor know"—that is, in idols. This I find to be a dominant theme in the Old Testament. Whatever thing a man sets his heart and his trust in most is his god; and if his god doesn't also happen to be the true and living God of Israel, that man is laboring in idolatry.[2]

President Brigham Young's view of economic prosperity is consistent with the quotes above from ancient and modern prophets. He understood well the process of creating and maintaining prosperity as he led the Saints to the Salt Lake Valley and helped them establish a state of prosperity by making the desert bloom like a rose. He said, "The riches of the kingdom or nation do not consist so much in the fulness of its treasury as in the fertility of the soil and the industry of its people."[3]

In this statement he recognizes three types of capital and their priorities: fertility of the soil, industry of the people, and, finally, the fulness of the treasury. Capital is a complex economic concept but can best be understood as anything that has the capacity for useful work. Money is one form of capital in a formal exchange economy since it can be exchanged for work. Everything produced and exchanged in the formal economy forms the general category of financial capital. But, according to President Young's statement, this is not the most important form of capital. Human intelligence and habits of industriousness are also forms of capital according to our definition of capital as the capacity for useful work. When Brigham Young arrived in the Salt Lake Valley, the Saints had a shortage of financial capital but an abundance of human capital in the form of industrious individuals and a cooperative culture as a group.

Brigham Young also identifies fertility of soil as an important form of capital. This specific form of capital is representative of the class of all capital created by God without interaction with humans. This class includes the basic process of photosynthesis for capturing sunlight and converting it into chemical energy more usable by humans. It also includes such things as soil-building processes, water filtration through wetlands, air cleansing by trees and vegetation, and a host of other silent work processes done by nature, under the direction of God, for the benefit and use of man (see D&C 59:18–21).

The dilemma we face in organizing our economic activities is that the financial capital that Brigham Young identifies as being the least important is also the easiest to measure. Consequently, conventional thinking about economic activity is focused almost exclusively on financial capital with very little attention given to those aspects of human and natural capital that do not have an easily measured financial value. Figure 1 shows a pictorial representation of this dilemma. The upper diagram illustrates conventional economic thinking that is dominated by financial capital. The lower diagram shows an alternative form of economic thinking that is consistent with the prophets quoted above and with Wendell Berry's concept of the little human economy of financial capital embedded within the greater economy including human industriousness and nature's gifts from God.

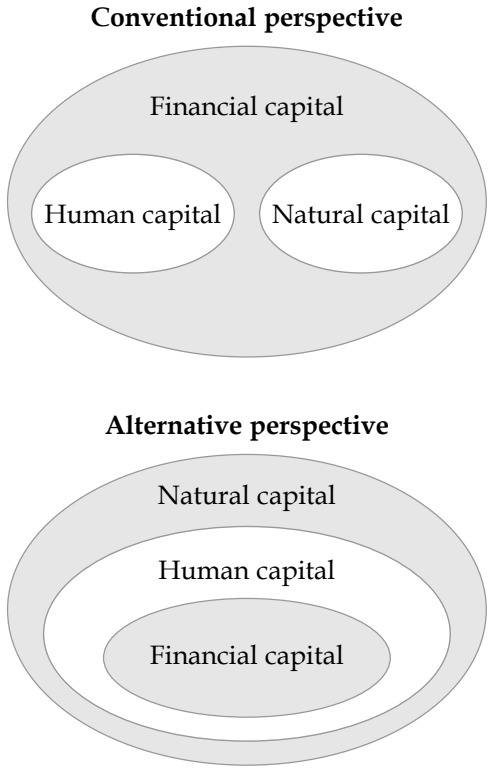

Figure 1. Relationship between types of capital

2. Accounting Systems for the Great Economy

A major appeal of the conventional perspective is that we have sophisticated accounting systems for measuring and tracking financial capital. What is not nearly as well known is that systems ecologist Howard T. Odum and others have developed energy-based accounting systems that measure the value of natural and human as well as financial capital. These developments are very helpful to those who desire to fulfill their sacred stewardship over the things that the Lord has created for us as well as over the things created by humans.

According to Odum, "Everything which we regard as being of real value has to be produced and maintained by work processes from the [physical] environment, *sometimes helped by people and sometimes not*."[4] This observation is consistent with the alternative economic perspective in figure 1 because natural capital includes all work processes from the physical environment, human capital includes all works processes that occur with the interaction of humans, and financial capital includes those work processes that include human interaction and an exchange of money.

The key insight from Odum is that money cannot serve as a common denominator for all work since only a portion of work done for the benefit and use of man occurs with an exchange of money. However, all work involves a transformation of energy, which means that energy can serve as a common denominator for all work. The energy accounting system developed by Odum is called EMergy (Energy Memory) Analysis and is a comprehensive system that evaluates all work done for the benefit and use of man, whether the work is done by God alone through natural processes or whether the work is done in partnership with humans. A comprehensive accounting system capable of helping people make wise decisions in meeting their temporal needs must include nature's free work as a foundation for human prosperity. Odum spent a lifetime developing a system that measures the value of all types of work.

The foundation of an energy accounting system is that all economic activity originates in the material world and is subject to basic laws of energy transformations, especially the first and second laws of thermodynamics. In spite of the imposing title, the laws of thermodynamics can be best understood as a set of principles "governing the bookkeeping by which one keeps track of energy as it moves through [various] transformations."[5]

Money accounting is much more common and straightforward than energy accounting. However, there are some strong analogies that can be used to help understand energy accounting. A basic money accounting system has two major statements: an income statement that keeps track of how much money is currently flowing into and out of an organization, and a balance sheet that shows the stock of total assets that an organization has at the beginning and end of a period. The relationship between income and assets is that assets that exist now were purchased or produced from earlier income. From this perspective, income is flowing money, and assets are previously stored money.

Energy systems also consist of stocks (assets) and flows (income). For example, falling rain is a flow of material and energy while water stored in man-made reservoirs or in nature-made soil storages are stocks of energy in the form of water. Both falling rain and stored water can perform useful work in satisfying water and power needs and must be accounted for in a useful accounting system.

Accounting systems are invaluable tools for one who aspires to be a steward over the resources of an organization. If one aspires to be a steward over the financial resources of a business organization, then one must have access to a financial accounting system that accurately tracks cash flows into and out of a system. In like manner, if one desires to be a steward over a

human dominated ecosystem, one must have an energy accounting system that accurately tracks the energy flows into and out of the ecosystem.

3. Economic Strategies for the Great Economy

The energy accounting systems described in the previous section provide useful decision-making information to help manage the ecosystems that support a human economy. This section extends these ideas by identifying strategies to conduct our economic activities in a way that meets our current needs while preserving, to the extent possible, the foundation of real wealth for the future. We begin by identifying principles for operating in both the little human economy and the great economy of nature.

A guiding principle for operating in the little economy is to create and implement strategies that maximize profits of business organizations. This principle has been proposed and advocated by Nobel prize–winning economist Milton Friedman and others.[6] The rationale for the maximum profit principle is that a manager seeking to maximize profits will engage in those activities that create the most value while eliminating wasteful use of resources. The implication is that a business organization that is not maximizing profits runs the risk of being driven out of business by a competing organization that better uses its resources. The maximum profit principle is important in guiding business strategy, but it is limited to the inner circle of figure 1 that deals exclusively with financial capital.

A parallel principle, the maximum power principle, was discovered by Lotka and promoted by Odum.[7] In contrast to the maximum profit principle, which is a prescriptive principle that guides managers in selecting what strategies to implement, the maximum power principle is a descriptive principle describing the way that systems actually operate in nature. The essence of the maximum power principle is that natural systems allocate resources in a way that captures and uses available energy most effectively. Systems ecologists argue that the height of a tree or the shape of a leaf or the strength of the jawbone of a beaver are all determined by the maximum power principle. Those species or individuals that fail to operate by and adapt to the maximum power principle risk extinction.

The relationship between the maximum profit and maximum power principles is developed in more detail elsewhere.[8] We will summarize the key points here as they relate to our current topic. The business principle of maximizing profits is a prescriptive optimizing principle that applies only to work done by humans for pay, while the maximum power principle is a descriptive optimizing principle that applies to work done by nature for free. What is missing is a prescriptive optimizing principle that applies to the interaction between the economy and the environment.

Odum supplied the missing link by recognizing the value of all types of work and by developing a guiding optimizing principle that applies across all types of work. Odum recognized that energy can serve as a common denominator for all work, since all work is accompanied by an expenditure, or transformation, of energy. Since energy is the common currency for all work, Odum's extension of Lotka's maximum power principle includes all work done by nature, with or without the interaction of humans. The essence of Odum's principle is that those human-nature partnerships that capture and use all sources of energy as effectively as possible will be the ones that will be economically viable in the long run.[9]

This extended version of the maximum power principle takes into account an important distinction between nature's work and human work—choice. Nature is governed by inviolable natural laws, while humans exercise agency.

According to Odum, the best strategy for organizing human economic systems is to "let nature work for you, . . . that's the key. Wherever you are in the world, you find out what the natural cycle is and how you fit into it, developing a

partnership with nature."[10] Humans are free to organize economic activities in ways that are or are not consistent with the maximum power principle. However, those system designs that are more in alignment with the extended maximum power principle will be the ones that will prevail in the long run.

The principle of agency is that we are free to choose our actions but are not free to choose the consequences of our actions. The principle is understood by Odum's former student, Charles Hall, who says that energy systems theory "attempts to put all of nature into the evaluative process. It says, 'Here is nature. It has its own standards of value from which we should learn and which we should use to make our own decisions, so that the decisions will be consistent with what nature will allow in the longer run.' It doesn't matter what humans want except as that can be integrated into the larger perspective of nature. Thus we had better understand nature well. Free will exists, but it will work in the long run only if it is consistent with the larger patterns of nature."[11]

Odum's concept of partnering with nature is related to a larger principle of the need for each of us to partner with God to achieve our eternal purposes here. Hugh Nibley writes of a forgotten teaching of the early Jews and Christians that "the dominion that God gave to Adam in Eden over his other creatures was nothing less than the holy priesthood, the power to act in God's name."[12] Nibley goes on to quote an early Christian writing that "man by his sovereignty over nature resembles God but he enjoys that authority only as long as he behaves in a godlike manner."[13] Behaving in a godlike manner includes partnering with God to blend our work to the work God has already done for us through the operating of the natural world.

Odum's partnership ideas have been implemented for several decades in his own state of Florida. One such project deals with the massive amount of sewage generated at Walt Disney World. That sewage is now treated by ecological engineering ideas derived by Odum to optimize the effectiveness of the partnership between humans and nature. The human-nature partnerships are in the form of restored wetland restoration used to filter water for human use. The human part of the partnership in such projects is to increase the capacity of natural capital to do its work. The result is improved habitat and lower costs to complete the task.[14]

Humans are free to choose wisely to partner with nature in mutually effective ways, but we are also free to ignore or even interfere with or destroy the work of nature. However, humans are not free to choose the consequences of our actions, the one being sweet and the other being bitter. The penalties for violating natural laws are real and irrevocable, and we as a culture will surely bear the consequences. Hall points to many failed civilizations and offers this observation: "Any civilization that believes it can assign value independently of the laws of nature and the dictates of resources can do so only in the short term."[15]

4. Practical Stewardship in the Great Economy

Agriculture provides an excellent setting to illustrate the beneficial partnership between God and man. Sir Albert Howard, the founder of the organic farming movement, describes the processes necessary to maintain soil fertility as an excellent example of the interplay of financial and natural capital and the ways in which narrow financial accounting systems can mislead. Howard observes the increasing gap between life-giving humus taken from the soil compared to the humus that is returned to the soil. He expressed concern over the increasing use of chemical fertilizers to fill the shortage of natural manures put back into the soil.

Even though the man-made substitutes appear to be cheap, Howard objects to the use of chemical substitutes for humus for two reasons. His first objection is that the substitutes are inadequate because "nature has ordained that the

soil must live and that the mycorrhizal association must be an essential link in plant nutrition."[16] This observation is consistent with that of American farmer Gene Logsdon who suggests that "biological efficiency" may be orders of magnitude greater than industrial efficiency.[17] Logsdon uses the term "biological efficiency" to refer to the productivity of divinely designed processes of nature that operate independent of human interaction.

Logsdon supports his personal observations with the work of Swedish information theorist Steffan Dalin, who concludes from information theoretic concepts that natural systems operate near theoretical optimal limits, while human designed systems operate far below these limits. The implication of Dalin's work is that we as humans either need to be more clever in using the efficient work already being done by nature or we need to find ways to better imitate the designs and processes of natural systems.

President Brigham Young understood well the principle articulated by Logsdon and Dalin: "Man's machinery makes things alike; God's machinery gives to things which appear alike a pleasing difference; . . . endless variety is stamped upon the works of God's hands. There are no two productions of nature, whether animal, vegetable or mineral, that are exactly alike and all are crowned with a degree of polish and perfection that cannot be obtained by ignorant man in his most exquisite mechanical productions."[18]

Howard's second objection to the use of chemical substitute for nature's humus is that the cheapness of chemicals is only a mirage, whereas in reality they are very expensive. He pointed out that the use of chemicals decreases the fertility of the soils, which decreases the nutritional value of the food grown in the soil, which results in health problems that require additional chemical solutions as well as a supporting health-care system. He concluded that "when the finance or crop production is considered together with that of various social services which are needed to repair the consequences of an unsound agriculture, and when it is borne in mind that our greatest possession is a healthy . . . population, the cheapness of artificial manures disappears altogether."[19]

Howard, like Brigham Young before him, was recognizing that prosperity depends not so much upon the fulness of the treasury as measured in terms of financial capital alone, but, more importantly, on the health and industry of the people, which was supported and sustained by the fertility of the soil. He was also identifying the need for more comprehensive accounting systems to measure the true cost of different policy strategies.

Another example of the importance of soil fertility in measuring productivity is given by ecologist John H. Storer in his short treatise on the "web of life."[20] Storer explained how deserts can have surprising soil fertility, identifying the Arizona desert as some of the most productive soil in the United States. The productivity of the desert is latent until the addition of proper amounts of water. Storer said, "With irrigation, a desert may become fabulously productive."[21]

The lesson from the examples from Odum, Howard, and Storer is that in order for humans to prosper as individuals, families, communities, and even as a species, we must understand and appreciate the things God has prepared for us to meet our temporal needs during our mortal journey. Once we do understand and appreciate these things, then the path to prosperity is to develop our understanding and ingenuity and to use this ingenuity to partner with these natural processes to meet our needs. By doing this, we meet our own needs in the most energy-wise way, which leads to prosperity, and we also meet our needs in a way that preserves the foundation of wealth for future generations.

Accounting tools have been helpful in carrying out our stewardship, but we must understand that all of the technical tools in the world will not make any difference unless they are accompanied by a fundamental shift in the way we as individuals and communities think

about wealth. The necessary paradigm shift involves a change in thinking about prosperity in terms of how much we consume to thinking about prosperity in terms of how well we use the resources provided for us. The new paradigm begins by developing an abhorrence for waste as strong as Brigham Young's:

> Never let anything go to waste. Be prudent, save everything, and what you get more than what you can take care of yourselves, ask your neighbors to help you consume. . . . Never consider that you have enough around you to suffer your children to waste a crumb of it. If a man is worth millions of bushels of wheat and corn, he is not wealthy enough to . . . sweep a single kernel of it into the fire; let it be eaten by something and pass again into the earth, and thus fulfill the purpose for which it grew. Remember it, do not waste anything, but take care of everything.[22]

There are many who confuse prosperity with the power to waste. An oft-spoken rationale for waste is that if people own something, they are entitled to do with it as they please. This rationale is based on an assumption of the primacy of financial capital while deemphasizing human and natural capital. Brigham Young offers a different perspective by reminding us that one can never have enough to be wasteful, that everything that was created was created for a purpose, and that we interfere with God's plan when we waste something that He created for a purpose.

Brigham Young makes a clear connection between our stewardship over natural capital and over human capital. When we waste the resources provided for us by God, we harm our brothers and sisters. This principle is also emphasized in the 104th section of the Doctrine and Covenants: "For the earth is full, and there is enough and to spare; yea, I prepared all things, and have given unto the children of men to be agents unto themselves. Therefore, if any man shall take of the abundance which I have made, and impart not his portion, according to the law of my gospel, unto the poor and needy, he shall, with the wicked, lift up his eyes in hell, being in torment" (D&C 104:17–18).

Consider, for example, the case of Interface Inc., an Atlanta-based carpet company founded by entrepreneur Ray Anderson in 1974 and run very successfully according to conventional business principles until 1994. In 1994 he had a life-changing experience that convinced him that he was guilty of "intergenerational tyranny" because he was wasting natural resources and operating his business in a way that diminished the chances of his grandchildren and others having the same quality of life that he has had.[23]

His response was to strive to create the first company that returned more to the earth than it took away. Interface created a culture of eliminating waste that impacted many important business decisions. Their Shanghai factory faced a common manufacturing-design problem that required pumping liquid through a series of machines. An Interface engineer committed to waste reduction made two simple design changes that reduced the power needs from 95 horsepower to 7 horsepower, a 92 percent savings in energy.[24]

Another important innovation growing out of Interface's drive for zero waste is a modular carpet tile product, Solenium, which makes it possible to replace only worn sections. Furthermore, old carpet tiles are remanufactured into products identical to new carpet tiles. The skills that Interface has built up in resource productivity and waste reduction put them in a position to better capture this competitive advantage by maintaining ownership of the product and selling the service provided by the product. They do this by signing a contract to provide sufficiently for the needs of the customer. The contract is based on results, so the incentive for Interface is to find the most effective ways to use all resources within reach to meet the customers needs.

Compare this to the traditional strategy of selling as much carpet as possible to the customer. With the selling carpet strategy, the more carpet sold, the more money the company makes, at least in the short run, while all

resources are plentiful enough to keep prices at low enough levels. Using more resources than needed to sell the customer more carpet than needed works fine until scarcities arise, causing production and distribution costs to increase, or until someone like Ray Anderson begins to comprehend the harm he may be doing to others living now or in the future.

This shift to supplying customers with enough for their needs is profound. A focus on ends rather than means led Ray Anderson to define waste as "any measurable input that does not add to customer value."[25] This definition of waste helps a company find waste that is not likely to be discovered while striving to sell as much product as possible. The elimination of the waste that is discovered yields higher profits to the provider, lower prices to the customer, and less environmental impact to the community. This win-win-win occurs because a service and flow strategy aligns the incentives of providers, customers, and communities.

Companies like Interface can succeed in the marketplace, but only if enough consumers and investors find out what they are doing and why they are doing it and are willing to support them by investing in them and using their products. Most people realize that for democracy to succeed, it must have a responsible and informed electorate. What is not as obvious is that for free markets to succeed in bringing forth a just and lasting prosperity, the market must have a responsible and informed "consumerate" and "investorate." For those of us who are fortunate to live in a free market democracy, it is an important part of our sacred stewardship to be part of the responsible and informed electorate, consumerate, and investorate.

Conclusion

In conclusion, we have shown how new tools and concepts for measuring and thinking about prosperity can foster better environmental stewardship and accountability. We close with an observation that stewardship, rather than sustainability, is the key principle for Latter-day Saint environmentalists. This is so because Doctrine and Covenants 88:25–27 confirms that the earth will die. Striving for sustainability in the strict sense is futile since the earth, in its mortal state, will die and be resurrected and achieve its celestial glory. The earth, like our bodies, is not intended for immortality in its current state.

However, acknowledging the earth's mortality in no way diminishes our stewardship responsibilities; in fact, stewardship is really a higher standard since we are accountable to the Creator for the way in which we have used the resources that He created for our use and benefit during our mortal journey. Accountability to God is more powerful than accountability to those who will live in the future, even though the latter is still important.

The tools and concepts described in this paper can help us to better account for our stewardship over earthly things, but ultimately the quality of our stewardship will depend more on the depth of our commitment to building the kingdom. Once we recognize, appreciate, and understand the processes, then we are in a position to wisely design our own economic activities so that they build on what God has already provided for us.

Notes

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3. Brigham Young, *Discourses of Brigham Young*, sel. John A. Widtsoe (Salt Lake City: Deseret Book, 1941), 297.

4. Howard T. Odum, *Environmental Accounting: Emergy and Environmental Decision Making* (New York: John Wiley & Sons, 1997), 6.

5. Paul R. Ehrlich, Anne H. Ehrlich, and John P. Holden, "Availability, Entropy, and the Laws of Thermodynamics," in *Valuing the Earth: Economics, Ecology, Ethics*, ed. Herman E. Daly and Kenneth N. Townsend (Cambridge, MA: MIT Press, 1993), 69–73.

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10. Charles A. S. Hall, ed., *Maximum Power: The Ideas and Applications of H. T. Odum* (Niwot: University Press of Colorado, 1995), 99.

11. Hall, *Maximum Power*, 205.

12. Hugh W. Nibley, "Brigham Young on the Environment," in *Brother Brigham Challenges the Saints*, ed. Don E. Norton and Shirley S. Ricks (Salt Lake City: Deseret Book, 1994), 43.

13. Nibley, "Brigham Young on the Environment," 44.

14. Nibley, "Brigham Young on the Environment," 99.

15. Hall, *Maximum Power*, 205.

16. Sir Albert Howard, *An Agricultural Testament* (New York: Oxford University Press, 1943), 37.

17. Gene Logsdon, *At Nature's Pace: Farming and the American Dream* (New York: Pantheon Books, 1994).

18. Nibley, "Brigham Young on the Environment," 34–35.

19. Sir Albert Howard, *An Agricultural Testament* (New York: Oxford University Press, 1979), 38.

20. See, for example, John H. Storer, *The Web of Life: A First Book of Ecology* (New York: Devin-Adair, 1954).

21. Storer, *Web of Life*, 29.

22. Young, *Discourses*, 292.

23. Donald Adolphson, "Providential Living: A Business Idea Whose Time Has Come," *Marriott Alumni Magazine* (Fall 2001): 4–8.

24. Amory B. Lovins, L. Hunter Lovins, and Paul Hawken, "A Roadmap for Natural Capitalism," *Harvard Business Review* 77, no. 3 (May–June 1999): 14–17.

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