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## “I AM THE VINE, YOU ARE THE BRANCHES...”

### *Bringing the Spiritan Charism into the Laboratory*

#### **Bruce Beaver**

Bruce Beaver is Associate Professor of Chemistry at Duquesne University, Pittsburgh. His research interests include sustainable forestry and the development of clean fuels from coal. Recently, Bruce has become interested in exploring aspects of the complex relationships between science, technology and Catholicism. He lives together with his wife, Gina, and their three children, Vinny, Sammy and Gussie, in a rural Pennsylvania home in an oak forest.

As a Catholic, I am familiar with John 15:5 and its spiritual meaning – the Lord is the vine and we, His followers, are the branches. As a professor who studies and teaches aspects of forestry and wine making, I can also look at John 15:5 in a scientific way – a sturdy vine produces a multitude of branches which produce abundant fruit. As a Catholic chemistry professor, I know that the transcendent and the physical rarely gel: it’s the ole’ science vs. religion debate where conviction is a curse and physical reality is all that is real. It can be a struggle.

Fortunately, my faculty position at Duquesne University has allowed me to develop a Catholic sensibility while participating in contemporary teaching and research. Over the years, the faith or fact deliberation has disappeared for me thanks, in part, to one of the Lord’s “branches” (transcendent meaning, mind you) known as the Spiritans. But it’s not just me, the little ole’ Catholic chemist, who has benefited from the Spiritan charism,<sup>1</sup> which recognizes that all people of good will, whether they realize it or not, are involved in growing God’s love. Yes, we are all branches. For hundreds of years and in hundreds of places, the Spiritans have been sharing God’s love through many and varied ministries, one of which is Duquesne University. In collaboration with laity, the Spiritans at Duquesne have been agents for positive change in the Pittsburgh region for more than 120 years. As the world becomes smaller through globalization, because of its Spiritan legacy, Duquesne is well-positioned to continue its neighborly legacy even across the oceans.

The Spiritan charism has energized much of my teaching and research. Let me share some of my “fruits” . . .

#### ***What are people for?***

The most obvious way that a university can improve the world is through attention to its educational mission. Catholic universities are potentially powerful cultural correctives through their core curriculum. I believe the best curriculum contains general education courses which engage various academic disciplines with a Catholic sensibility.

At appropriate times in my chemistry classes I illuminate the topic at hand with a Catholic sensibility. I call my educational approach

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*Value Added Education (VAE).*<sup>2</sup> I define VAE as secular education that is in dialog with the transcendent aspect of reality. For example, I have the students in my course in our core curriculum read a 1985 essay by cultural critic Wendell Berry entitled, *What Are People For?*<sup>3</sup> The essay is part of a unit on the chemistry of food and energy production. In this essay Berry suggests that transportation fuels are more than just energy sources, they are powerful social forces as well. In the United States, since World War II, Berry claims a corporate technological culture has developed and is engaged in extracting natural resources from rural regions in a non sustainable way. He writes that very little has been economically contributed to the affected rural economies and communities. Berry also suggests a colonial relationship has evolved between urban and rural communities. He goes on to point out:

*...with hundreds of farm families losing their farms weekly, economists are saying that these people deserve to fail, that they have failed because they are "the least efficient producers," and that the rest of us are better off for their failure. ...The resulting farm to city migration (in search of jobs) has obviously produced advantages to the corporate economy. The absent farmers have had to be replaced by machinery, petroleum, chemicals, credit, and other expensive goods and services of the agribusiness economy. ...At the same time the cities have had to receive a great influx of people unprepared for urban life...people whom are many times assumed to be "permanently unemployable." ...The great question that hovers over this issue, is the question of what are people for. Is their greatest dignity in unemployment? Is the obsolescence of human beings now our social goal? ... In the country, meanwhile, there is work to be done. This is the inescapably necessary work of restoring and caring for our farms, forests, and rural towns and communities-work that we have been unable to pay people to do...*

*The great question that hovers over this issue, is the question of what are people for.*

*...we have not learned how to connect transcendentally derived values to the real world.*

Catholic social teaching has much to tell us about the economy described by Berry. Simply stated, Catholics believe the economy is to serve people, rather than the reverse. However, it is difficult to find examples of Catholic social teaching being applied in today's world. I believe that part of the reason for this is - as a culture - we have not learned how to connect transcendentally derived values to the real world. Our common experience is that Catholic social teaching is for the academy while the real world seems to be driven solely by technology in the market place.

Look at the Eucharistic celebration. The Church takes great care in the presentation of the bread and wine which will become the

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body and blood of our Lord. The Church also cares about all the varied agricultural aspects involved in the production of the wheat and grapes which, upon consecration, become the body and blood of Christ. Catholic social teaching informs us that we should care about *the work of human hands* which is involved in the growing and harvesting of wheat and grapes. All agriculture should be done in a manner that is both environmentally and socially sustainable.<sup>4</sup> Social sustainability includes whether *the work of human hands* is paid a just wage, including health care and retirement benefits, worthy of a human dignity that is derived from God.

Unfortunately, the world in which we live is a fallen world. It is a world full of pain, suffering and injustice. It is a world often driven by values antithetical to those of Catholic social teaching. In this dark world, the Church is called to be light that radiates God's love to our neighbors. VAE is designed to address this problem by making students aware that transcendent values are, in isolated places, driving science and technology in the marketplace. Students must also understand that their marketplace choices either hinder or help these efforts.

***“Come to me, all you who labor and are burdened For my yoke is easy and my burden light”. (Matthew 11:28-30)***

In addition to socially aware teaching, Duquesne and other Catholic universities can positively influence the world through faculty research projects. In my case the cultivation of VAE ultimately flowed into my choice of research problems.

*...some people are constitutionally made by God to make their living in rural occupations.*

Having lived for 13 years in rural Pennsylvania, I have come to believe that some people are constitutionally made by God to make their living in rural occupations. These are people who Berry describes as having agrarian sensibilities and are happiest working in what Berry calls an agrarian economy.<sup>5</sup> Such an economy:

*...rises up from the fields, woods, and streams - from the complex of soils, slopes, weathers, connections, influences and exchanges that we mean when we speak of local water shed. . . . The agrarian mind is not national or global, but local. It must know on intimate terms the local plants and animals and local soils; it must know local possibilities and impossibilities. . . . The agrarian mind feels threatened and sickened when it hears people and creatures and places spoken of as labor, management, capital, and raw material. . . . The agrarian mind is interested - and forever fascinated*

*- by questions leading toward the accomplishment of good work: What is the best location for a particular building or fence? What is the best way to plow this field? What is the best course for a skid road in this woodland? Should this tree be cut or spared?*

In Berry's 1996 essay, *Charlie Fisher*,<sup>6</sup> I was introduced to a man living agrarianism in the United States. Mr. Fisher is representative of hundreds of horse loggers working in the field of restorative forestry. Typically these people were conventional loggers, who have come to realize through their experiences that, when the prevailing corporate paradigm is applied to the forest, both environmental and cultural destruction results. These people have chosen to follow their personal vocation and leave more lucrative and comfortable jobs as conventional loggers. Instead they work with horses to log in a manner that restores and promotes forest health. They typically work in private forest holdings whose management has historically alternated between 'cycles of neglect followed by abuse.'<sup>7</sup>

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*...restorative forestry values future forest health over short-term financial gain.*

Correcting a forest's past management abuse is the goal of restorative forestry. Also known as "worst-first forestry," it is practiced by the partial removal of the lowest quality trees from a forest every decade or so. In this approach the best timber is left to grow larger and to provide the best genetic seed stock for forest regeneration. The best timber is ultimately removed, after reaching financial maturity, and after seeding the best possible genetic stock for the future forest. Contrary to conventional logging, restorative forestry values future forest health over short-term financial gain. With restorative forestry the primary reason why horses are used, rather than a mechanical skidder, is economics. When worst-first forestry is practiced, not much money is generated from the initial timber sales. Consequently, the advantage of using horses is that they are cheaper to buy and maintain. In addition, generally less soil compaction occurs since a team of horses is lighter than a skidder.<sup>7</sup> However, horses can be difficult to work with and they are less productive in terms of log volume. But, since a horse logger has less money invested in his logging "equipment," that means that he is able to earn less money from a particular logging job. Loggers engaged in restorative forestry tend to make less money and physically work harder than conventional loggers. Forest owners that hire horse loggers also get less financial return on their timber sales. Restorative forestry is practiced primarily because of the personal satisfaction gained in improving the quality of the forest.

It could be argued that the restorative forestry community, by rejecting dominant economic paradigms of forest management, is living some of the precepts of Catholic social teaching. From the perspective of the Spiritan charism the restorative forestry movement is a fruit of the vine.

About a decade ago, inspired by the example of selfless horse loggers such as Charlie Fisher, I decided to explore ways in which I could support the local restorative forestry effort. As previously noted, one of the hurdles of worst-first forestry is the low economic value of the low quality timber initially harvested. The economic value of timber is determined by both tree quality and species, with the most valuable timber yielding the greatest volume of unblemished lumber. Currently, Pennsylvania black cherry and red oak are desired internationally for quality furniture, flooring and paneling. Various species of hickory, white oak and maple are less desired and therefore of lower value economically. For instance, comparing logs of similar size and quality, black cherry is currently about nine times more valuable than white oak. Since restorative forestry is economically supported by a portion of the revenue generated by the sale of the logs, it is easier to finance the effort if the species removed have greater economic value.<sup>8</sup>

*A few days in the library convinced me that the best way to help the Pennsylvania restorative forestry effort was to become an expert in the role of cooperage oak in crafting fine wines and spirits.*

Any science or technology that increases the value of logs coming from regional forests could help the restorative forestry effort. Currently this effort is driven by the goodwill of loggers and individual forest stewards. The problem reduced itself to finding a way to improve a commercial product made with a local tree species of current low economic value. A few days in the library convinced me that the best way to help the Pennsylvania restorative forestry effort was to become an expert in the role of cooperage oak in crafting fine wines and spirits. As Gerald Asher, the wine critic for *Gourmet* magazine suggests, oak barrels are not used to introduce the flavor of oak. Rather, oak aging is used to craft an appealing bouquet by the appropriate marriage of the wood and grape-derived aromas.

***“Then the Lord looked upon the earth and filled it with his blessings. Its surface he filled with all manner of life which must return to it again.” (Sirach, 16, 27-28)***

My original idea was to develop inexpensive analytical techniques to assess the concentration of important wood-derived aroma compounds in individual white oaks. Then the trees from individual wood lots could be sorted into various groups, based upon similarities in their oak-derived bouquet potential. White oak timber with a quantitative estimate of its oak-derived bouquet

potential could incur an increase in value to cooperage companies. Such knowledge would help cooperage companies make barrels with differing degrees of oak-derived bouquet potential in a reproducible manner. The enhanced timber value would be significantly greater than the cost of the analytic chemistry used to characterize the logs. The extra economic value could then be used to financially support local restorative forestry.

For the first few years of the project, I was blessed with the help of a fine Duquesne chemistry undergraduate, Steve Matta. Our work was originally difficult in that we were “plowing new ground,” but we made some progress. Steve went on to medical school and is currently a practicing physician. Fortunately, other undergraduates and even high school students have helped move this venture slowly forward.

Major advances started in 2001 when doctoral student Paul Kolesar joined the effort. Paul is now in the process of writing his results into several papers soon to be published in the wine literature. Important conclusions include that we have been:

- (i) unable to develop a **cheap** analytical protocol that can assess the oak-derived bouquet potential for individual trees;
- (ii) able to establish that there are regional differences in the wood-derived bouquet potential for white oaks from different parts of the world;
- (iii) able to establish that Pennsylvania white oak has an oak-derived bouquet potential similar to that of French oak.

*...Pennsylvania white oak has an oak-derived bouquet potential similar to that of French oak.*

The last observation is extremely important with respect to our original goal of developing financial support for Pennsylvania restorative forestry. That is because French oak barrels are the premium for winemakers globally. The high demand for these barrels results in their price being approximately twice that of typical Midwestern United States barrels. This observation suggests that cooperage oak from Pennsylvania has great market potential. We are now exploring ways of linking this market potential with the local restorative forestry community.

***“I am the vine, you are the branches...”***

*Hopefully, the Spiritan charism will soon be expressed in regional white oak forests and rural communities.*

I have tried to illustrate how a contemporary expression of the Spiritan charism is present at Duquesne University in the classroom and laboratory. Hopefully, the Spiritan charism will soon be expressed in regional white oak forests and rural communities. Finally, I must acknowledge that it is very satisfying to help in a very small way to realize ‘a branch’ of the Spiritan charism.

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