

Grapes to Wine

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Last summer when I thought about my Presidential Address, I had a big question as to what form my talk would take. I thought of past Presidential Addresses, which were philosophical in nature and those that were informative on medical topics and topics far removed from medicine. We have been educated about the importance of family and life outside of medicine and about our responsibilities in teaching and how to better accomplish that. Indeed, the more I thought, the more daunting this task became. Then, in a conversation with Dr. Barry Essrig, I came to the realization that this is a chance to share with others what is important to me. I did, however, want to have some people still in the audience at the end of the talk, so I decided that perhaps there was a better way to approach this task. I also realized that this would be my chance to give a talk without worrying about the discussor who is going to critique me or someone in the back of the audience commenting that my data does not support my conclusions.

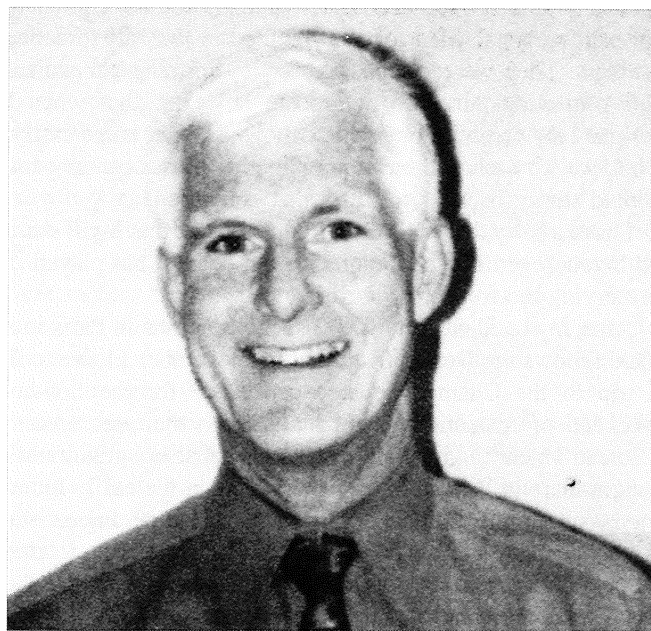
I have decided to give a two-part talk. First, I would be remiss in my obligations and would have missed an opportunity if I did not share some personal values and then, on to more interesting topics.

Certainly, the members of the Western Trauma Association (WTA) are similar in many ways. We are all leaders in our field. We all work 92 hours per week. We never miss our children's activities and we do not let our work interfere with our family and civic obligations. We publish four articles a year. We are all happily married and have 2.4 children, two dogs, and three vehicles, one of which is an SUV.

On the Internet, through Intermed and Opid, I was able to tally the publications of some of the past presidents of the WTA for several years. There are 1,300 citations for 18 authors over a 13-year period. There was a high of 389 citations for a single author. I am not sure about the accuracy of the Internet, however, as a 1975 article on certain characteristics of the bovine species was attributed to none other than Dr. E. E. Moore.

But just as importantly, we members are also very different. Perhaps in sharing some of my values, I can plant seeds or solve mysteries.

One of the things that is important to me is my family. As I look at this group, I feel, however, that this is like preaching



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to the choir. It is obvious that family is important to the members of this group. Indeed, the Western Trauma Association exists because of family. When I think of family and obligations, I am brought to an interview with Bill Cosby after the murder of his son Ennis. The statement that remained with me is his statement "I wish I could have one day to spend with him to tell him all the things I never said." It is important that we never pass up that opportunity to relay the importance of our family, our love for them, and their actions that make us proud. The opportunity may not return.

Another area of importance to me is service. Certainly, when we look toward our work, we have common areas of importance: service to our hospitals and universities, service to our National Committees, service to our groups, and service to programs that promote education.

I believe it also is important, however, to remember our community, to remember our hospital communities, to remember the local community in which we live. There are many ways to be of service: service organizations, donation of time, and donation of resources to help improve the communities in which we live.

On a larger scale, however, of special importance to me, is service to our country. In a way, I view myself as a patriot. I am proud of my country, although not necessarily always supportive of the policies. I am proud of the freedoms that we have and the cost of preserving those freedoms for others. I am also concerned that patriotism is fading away like

From Orthopaedic Physicians of Colorado, Englewood, Colorado.
1999 Presidential Address presented at the 29th Annual Meeting of the Western Trauma Association, February 28–March 6, 1999, Crested Butte, Colorado.

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MacArthur's "Old Soldiers." I am concerned that the sacrifices our country and families and individuals have made will be forgotten. The movie *Saving Private Ryan* was a grim reminder of some of those sacrifices. Perhaps it will allow younger generations to have a new appreciation for what they have and what others have given them. I am proud of the time that I spent in the Army Reserves. I did not appreciate being activated to Desert Storm, nor when I was activated for Operation Joint Endeavor, the support of the troops who were sent to Bosnia in 1996. Those activations were not enjoyable for my personal life, for my family, or for my practice partners. They were responsible for my missing our annual WTA meetings. It does not mean, however, that when I resigned my commission in the Army, the choice came easily. I believe we each still have an obligation to our country and should strive for ways to fulfill that obligation.

I have a story that will stay with me forever that I will share with you, regarding the importance our country has played in preserving the freedoms of others.

After my residency in 1978, I spent 4 months in Paris in a hand fellowship. During that time, on November 11, we took a trip to the Champagne area of France for the holiday weekend of Armistice Day. I had chosen that area around Chateau Thierry and the Marne River because my grandfather fought there in World War I. We sought out the easily found memorial to the armies of that time. A large impressive five-column structure that stood on a hill overlooking a large valley. We also found a small military cemetery and on the tombstones were many names that were familiar to me from my home area in the United States, being a region of German and Dutch decent. While in that small cemetery, it being obvious that we were Americans, several French couples came up to us to express their appreciation for what our country had done for them during that "war to end all wars." We also should not forget either those actions or our responsibilities.

About this time, however, you are asking what does all this have to do with the topic "Grapes to Wine." In a way, it is an analogy. As I look at our group, I see a wide variety of expertise and of achievement and of maturing into a "fine wine." There are many varieties of wine, some of which may be considered excellent, all of which have achieved the most from the grapes that were harvested. From the lowly white grape with "noble rot" to the ripe red cabernet, one can make wonderful wine, whether a sauterne or a heavy French Bordeaux. It must, however, be nurtured along. So, I thought it appropriate as an analogy, and perhaps more interesting than my personal remarks, that I use "Grapes to Wine."

In 1991, it was estimated that there were 20 million acres of vineyards in the world, with a yearly production of 25 billion bottles of wine. That meant that each individual in the world would have five bottles of wine per year. Obviously, that does not happen because of countries like France and Italy. While the per capita consumption of wine in Japan in 1991 was less than 1 liter per year, in Italy it was 62 liters, or 80 bottles, of wine per year. In France it was 67 liters or almost 90 bottles of wine per year. While this seems like a lot of wine per capita, it is far less than the 104 liters or 133

bottles of wine per year for both Italy and France in 1975. Perhaps the automobile and the pressures of modern cultures and medical findings are taking their toll.

The presence of wine seems to predate recorded history. Grapes and wine are depicted in early Egyptian tombs dating from the 15th century BCE. As shown on the map, wine seems to have its origin in the areas of Mesopotamia at a time estimated approximately 6000 BCE. In Egypt and Phoenecia, grapes were cultivated approximately 3000 BCE. It then coursed up through Greece and then to Italy and North Africa at approximately 1000 BCE. Over the next 500 years, grapes were cultivated in Spain, Portugal, and the south of France. That France is a leader in wine quality and production is no accident. The Romans, starting with vineyards in the area of Bordeaux in 50 CE, gradually cultivated plants with vineyards expanding to the area of the Bourgogne in 150 CE and the Lorie Valley in 250 CE. By 350 CE, the Champagne area in the north of France had been vinified. The oldest established vineyards, however, are in the southern area of France, in the regions of Languedoc and Provence; they are believed to have been originally planted by the Greeks in approximately 200 and 600 BCE, respectively.

It is no wonder that the most famous vineyards for quality wine production are in these regions, as the grapes have been selected over thousands of years to best match the growing areas and soil.

Once established by the Greek and the Roman empires, how did the vineyards survive after the fall of those empires through the dark ages of time and into the Middle Ages and the present day? The answer is "religion." During those times, the Church was the guardian for the continuing skills of civilization. Although the Catholic Church dominated, other religions also utilized and therefore protected wine through the ages. An early 14th century Haggadah, from northern Spain, pictures a Jewish Passover with the use of wine. During the golden age of monasteries in the Catholic Church, the Benedictine order in the early 12th century was cultivating the finest vineyards of Italy and France. The reputation of their monks for consumption of wine was notorious, and an early quote describes them "rising from the table with their veins swollen with wine and their heads on fire." This did not sit well with all monks, however, and the ascetic order of Cistercians was an immediate hit. They grew from the original abbey of Citeaux in the southern part of France up into Germany—two areas that became famous wine-growing regions in the Burgundy area of France and the Rheingau of Germany. It is interesting to me, that during my last activation in the Army, I was close to this area of Germany and would frequently drive through the town of Eberbach, where the Cistercian abbey of Kloster Eberbach still exists.

The most famous wine area in the whole world, however, was not born of the Church, but rather by politics, being perhaps an early example of the separation of church and state. The French area of Bordeaux was within a region controlled by the Duchy of Aquitaine from 1153 to 1455.

Marriage united this area to the Crown of England, and the

wines from the vineyards in this area were shipped to England to satisfy their love for "Vin Nouveau."

During this time, the art of wine making had become firmly entrenched and wine was stored in large wooden casks, called hogsheads. Each hogshead contained approximately 63 gallons of wine. Both for storage and transportation, however, larger containers were frequently used. The next larger container was termed a "pipe," containing two hogsheads, and the largest, a "tonne," which contained two pipes. That equals roughly 250 gallons of wine. The size of the merchant vessels used to transport these casks at the time were actually described by the number of large barrels that they could carry, thus the "tonnage" of the ship. Indeed, 250 gallons weighs approximately 2,000 pounds and is therefore the early origin for our common measurement of ton.

It is interesting to look at society and what was happening in the early 17th century in Europe. One of the facts that led to the large production, popularity, and consumption of wine was that it was the only storable beverage. Water was unsafe to drink, especially in cities. Ales quickly went bad, and caffeine drinks did not yet exist in Europe. But these wines, prior to the 17th century, would hardly be considered classic wines. As the world progressed, however, Europe was further civilized with the addition of chocolate from Central America, coffee from Arabia, and tea from China. Also, commercial distilling was developed by a Dutch physician at the University of Leyden, with the origin of gin or "English courage." Just as these events were threatening the wine industry, the invention of the glass bottle helped to secure its position in modern times.

Until the early 1700s, wine had been stored in wooden casks and placed in ceramic or glass containers only for pouring. The changes in glass-making technology, however, allowed bottles to become stronger and cheaper to blow; the crowning event was described by Hugh Johnson, the editor of *The World Atlas of Wine*, as "some unknown thinker brought together the bottle, the cork and the cork screw." It then became clear to those involved that wine lasted far longer when kept in a tightly corked bottle. Additionally, as it aged, it acquired a different flavor or bouquet. Being an entrepreneurial lot, the wine makers knew they had a good thing going. Wine produced and stored this way frequently commanded two and three times the price of wine still in the traditional casks. The owner of Chateau Haut-Brion first capitalized on this concept of "reserve wines." In 1660, he opened London's first restaurant under his name, Pontac's Head, and distributed his wines at a premium price.

Shortly thereafter, one of the most famous monks in all of wine making was attempting to create the perfect drink by blending various varieties. Because of the types of grapes and process for wine making in that region, however, once bottled, the fermentation process continued, much to the dismay of the monk. He discovered there were tiny bubbles in the bottles and was quite distraught. Although, the monk, Dom Perignon, was dismayed, the aristocracy was obviously not and, thus, as they say, "The rest is history." By the late 1700s, the art of wine making had progressed essentially to the level that we have today. Various regions, including France, Ger-

many, and Italy at the time, developed specific methods and with various grades, began producing specific regional wines, the Bordeauxs, the Burgundies, and the white wines of the Loire as well as the sweeter, lighter Gewurztraminers.

One of France's institutions in the 1700s was the Appellation D'Origine Controlee, which restricted the use of certain names of products that were made only in specific areas. Thus, Roquefort cheese could only be called "Roquefort" if it came from a certain area and was produced by a specific method from ewe's milk. Each wine area was also designated. In 1755, at a meeting in Paris of that organization, the various Appellations were laid down pretty much as they exist today. It was common knowledge at that time that certain red wines of the Bordeaux area fetched prices two and three times that of other wines. They were selected out as first growth wines or *premiere crus*. In addition to those wines from the Bordeaux area, only one other area, that from St. Julienne, was felt worthy to be included as a *premiere crus*. Next in line are the second-growth wines, frequently from vineyards adjacent to the land occupied by the first growth. The ranking of the wines in France then proceeds all the way down through fifth-growth wines.

An example of one of the first-growth wines, the 1982 Petrus Pomerol from St. Julienne, gives a glimpse into the status of these wines. That first-growth Bordeaux sold upon release for \$60 a bottle. This same bottle today, however, fetches a price in excess of \$1,400.

Other changes were also taking place. Napoleon III commissioned Louis Pasteur to investigate the reason so much wine spoiled and could not be kept for long periods of time. Through his scientific methods, Pasteur discovered that yeast caused a process of fermentation. With this discovery and outlining this process, the art of wine making became entwined with the science of wine making.

How then is wine made? First, we have to start with a grape. There are a large number of varieties of grapes that will make good wine. Certainly the most popular red grape is the cabernet sauvignon. This is the chief grape of the Bordeaux wines of France and obviously has a large production in California and Australia. Another red grape, the gamay, is a grape that grows best on granite hills with sandy soils, in a region of France called Burgundy. The best of that area is called Beaujolais. The other wines being produced from that grape in the Burgundy area, have made only fair wine. In various regions, the small parcels of land have, over centuries, worked into a symbiotic relationship between the best grape variety for a specific area and the characteristics of the soil. This area is frequently a sandy, gravelly top soil with multiple layers of various components, including a very tight marl, which is usually placed at the time of the planting of the vine. This is a very rich organic compost-like material.

In addition to the soil, the climate is of utmost importance. From November to March, the vine is dormant and only a deep frost below 5° Fahrenheit can harm it. However, from early growth through vintage in September or October, the weather of the region greatly effects the quality and character of the grape. The important times of a grape's life are carefully plotted by most vineyards and at Chateau LaTour in

France, one of the *premiere crus* vineyards, bud break has occurred as early as March 3rd and as late as April 2nd.

Perhaps the most important factor for the quality of the wine is the ripeness of the grape at harvest. As a grape ripens, the acidity decreases and the sugar content increases.

The moment for picking is carefully calculated and checked in the fields with a refractometer, measuring the sugar content. Occasionally, including some areas of Italy, the old-fashioned method of actually tasting the grape is still in use. It is the interaction between rain, sun, temperature, and humidity that adds character to each individual vintage.

Working to produce the best grape, the vineyard is in motion throughout the year. Although, vines frequently do not flower until May or June, pruning the vine so the sap is concentrated in very few grapes begins in January. The vineyard is plowed in March or April to help prepare the soil. May is the time of frost and constant watch is kept for its development which may necessitate the lighting of fires or the use of heat producing fans to help decrease the chance of frost damage to the bud.

Spraying to prevent mold is a common practice and needs to be done two or three times throughout the growing season. Constant pruning is necessary to concentrate the nutrients to the select grapes on the vine and not to the leaves and new shoots that are developing. In September or early October, the grape is usually ripe and the harvesting of the grape, or vintage, occurs. As new wine is being made, the byproducts, especially skins, along with fertilizers, are plowed back into the soil. In vineyards that are steeply terraced, soil, which has been washed down the slope throughout the growing season, is collected and is taken back up and spread throughout the vineyard.

Simultaneous with the growing of the grape is the preparation of the wine. Throughout the year, there is constant motion and a continuous process to properly prepare and age the product.

Once the grape is harvested, it is placed into a crusher/stemmer, which basically separates the stems from the remainder of the grapes. In white wine made from red grapes, the skins are quickly removed. The longer the skin stays in contact with the juice, the more deeply colored the wine. A true red wine, therefore, stays in contact with the skins for longer periods and actually goes through fermentation together. In the production of white wines, however, the juice is quickly separated from the skins, a pneumatic press being required for this. White wine is fermented with only its juice. The duration of fermenting greatly effects the type of wine. In a white wine, if fermentation is stopped early while some sugar remains, the wine is sweet. Sparkling wines are taken from the vat prior to completion of fermentation. The fermentation process, however, is not stopped, but continues in the bottles. The dryer white wine is left in a fermenting vat until all sugar is converted to alcohol. The aging of wine in oak casks gives a particular flavor, and this is extremely important for each individual vineyard. Oak casks are more commonly used in red wines. It is said that French oak produces the best cask for flavoring and even within France,

there are oak forests that are more highly prized for their wood.

With the advancement of technology and the science of wine, these processes are strictly controlled and monitored regarding sugar, acid, and alcohol content of the wines. It is during this process that the wine maker can greatly influence the final product. It is he who decides when to pick the grapes. In hot weather, for instance, nighttime or early morning picking allows the grapes in the vat to be cooler, thus making a difference in freshness and aroma of the ultimate wine.

The contact of the wine with oxygen also greatly changes the flavor and concentration. A more delicate grapey wine is produced when oxygen is kept out of the process. The extreme example of this technique is the use of carbon dioxide to fill tanks prior to piping the wine in, thus preventing the wine itself from coming in contact with any oxygen.

The process of *racking* is actually siphoning off the wine from the *lees*, which are the dead yeast cells and other solids at the bottom of the container. This must be done two or three times during throughout the aging of the wine.

Before bottling, the process of *fining* a wine occurs. This is a process of taking the sediment out of a wine by adding various substances. Beaten egg whites were frequently used and, in older times, even ox blood was used as a coagulum. Today, however, this is frequently accomplished with compounds such as bentonite or clay. During the fermenting process, especially in wood containers, wine seepage occurs, thus leaving a small amount of oxygen at the top of the casks. This is not beneficial for the proper aging of the wine and therefore, throughout the fermentation process, "topping off" of the casks must occur. These processes throughout the wine maturing are constantly monitored by the cellar master.

In the United States, The University of California at Davis has perhaps the best known enology department. The tasting and description of the wine is a whole other art form. Generally, wines are scored or evaluated through various aspects such as sight, smell, and taste.

The aroma wheel developed at UC Davis starts with broad groups of aromas, such as fruity, then branches out to other divisions. Fruity, for instance, is categorized further as citrus, tropical, dried fruit, etc. From there, the various specific fruits are brought in, such as mint or grapefruit or peach. This occurs for all the different aromas, with the chemical aroma being broken down into papery and then even wet cardboard or burnt match aroma. I am not sure what actually makes a wine excellent and certainly it is somewhat individual. Most of us, however, can tell the difference between "Annie Greensprings" and a chardonnay from a famous California vintner such as Chalk Hill.

What can we now say about wine and about ourselves? I think as we look around we can say that we are not unlike the grapes that are taken at the peak of the season, having been influenced by their local terroir and, whether a cabernet, chardonnay, a pinot noir, or sauvignon blanc have been nurtured to ripeness and artfully coaxed and crafted into a vintage wine.

Cheers, prost, zum Wohl!!!