Wine grape growers have been struggling since the days of Pliny the Elder in ancient Rome to get their varieties straight. Over the centuries, ampelography—as the science of vine identification is known—has become more sophisticated, but given the thousands of species, varieties, and clones planted all over the world, it still can be a convoluted and even inaccurate process.

Take, for example, French Beaujolais, a wine primarily made from the gamay grape. Sounds simple, except that many other varieties called gamay, but which really are not gamay, are used in that wine, too. To further complicate matters, in California the variety used to make a light and fruity red wine that looks and tastes much like Beaujolais is called gamay Beaujolais—although it is really a clone of pinot noir. Gamay Beaujolais is not to be confused with a sturdy red wine called Napa gamay (which is in reality made from a variety called valdiguie).

Got that?

Well, of course not. But it goes to show just how complex and confusing wine grape nomenclature can be.

Ampelography was a hit or miss proposition until Professor Pierre Galet came along and began his work in the 1940s. Galet, Chairman of the Department of Viticulture at Montpellier, the top French viticultural school, formalized the ways scientists could positively identify grapes, thus founding modern ampelography.

Galet created a system of identification based on the shape and contours of the leaves, the characteristics of growing shoots, shoot tips, petioles (stems that attach leaves to shoots), the sex of the flowers, the shape of the grape clusters, and the color, size, seediness, and flavor of the grapes themselves.

The technique works fairly well when identifying varieties—that is, telling Cabernet Sauvignon from Pinot Noir, or Zinfandel from Chardonnay. It works less well when telling one clone—or sub-variety—from another. And it’s not foolproof. Soil, climate, disease, and insect damage can all alter leaf shapes, shoot growth, and other characteristics, throwing ampelographers off track.

Some characteristics, especially of the grape berries, are less prone to variability. Skin color, the color of the pulp inside the berry, the presence and shape of seeds, and the sex of the flowers are all qualities that change very little even when growing conditions are quite dissimilar.

Grape flavor would be another stable criterion, but it’s the human palate that’s unstable, as anyone who has done a great deal of wine tasting knows. Although some wine lovers pride themselves on their ability to
identify a wine by aroma and taste, the human sensory ability is just not
precise enough to be scientifically accurate.

And yet, with the worldwide explosion of interest in wine and the
proliferation of clonal variations within varieties, it’s ever more important for
growers to know exactly what they’re planting, for winemakers to know
exactly what they’re fermenting, and for consumers to know exactly what
they’re drinking.

The folks at William Hill Winery in Napa, California, are speeding this
process along by giving consumers an ampelographic lesson with their new
wine labels. The chardonnay label is die-cut in the shape of a real chardonnay
leaf, the cabernet sauvignon label in that variety’s leaf shape, and so on.
Winemaker Jill Davis says that “it would have been easier to have a generic
grape leaf shape, but we wanted it to be accurate to suggest we’re making
honest wine here, and to educate the public.” The die-cut labels were
introduced in the fall of 1997, and Davis says they’ve been “extremely well
received.”

Ampelography has been the only scientific way to sort out all the
confusion that the proliferation of new crosses and the increasing number of
clones has caused. In France, ampelographers have shown that vines with
different regional names turn out to be the same vine. Conversely, vines that
are supposed to be of the same variety turn out to be different varieties
altogether. Ampelography has been used to trace the origin of vines—
scientists have traced the cabernet sauvignon vine back to its wild origin in
the region around the Caspian Sea. And it’s been used (so far without
absolute surety) to try to determine exactly where the zinfandel grape of
California originated.

Although such attempts have not met with complete success using
Galet’s traditional ampelographic techniques, hope for better techniques is on
the horizon. I asked Linda Bisson, Professor of Enology at the University of
California, Davis, whether DNA analysis might be used to identify grape
varieties.

“That is the ultimate goal, although we’re not there yet,” Professor
Bisson said. “It’s the same technique forensic scientists use for criminal
investigations. If we can find exact gene sequences that are unique to certain
varieties and clones, then we should be able to use DNA analysis to
determine precisely what variety or clone we’re dealing with.

“The problem right now is finding those unique marker sequences.
We’re working on it, and I’d say that within five years we’ll have it.” One
early result seems to indicate that zinfandel came from Croatia, where it is
known as plavac mali.

Eventually, then, Pierre Galet’s ampelographic method will yield to the
more precise method of DNA analysis. But there will always be those among
us who will look at a vine leaf and say, “That’s Cabernet Sauvignon.” And,
oftentimes, we’ll be right.