Under Pollard, however, the institute raised a record $25 million last year alone, and the stock market increased the value of its investments. Salk will soon receive another bolus of more than $16 million if a pending deal with Merck goes through. This would allow the pharmaceutical giant to buy a biotechnology company in which the Salk has major stock holdings, Sibia Neurosciences.

Although Salk is in better financial health than ever before, supporting three endowed chairs for the first time, Heinemann and other Salk researchers say the institution would like a much larger endowment still, so that, ideally, all 56 faculty members would have endowed chairs. "A lot of faculty are struggling," says Heinemann, who has one of the three current chairs. The Salk board recently brought in an independent consultant to review the organization and make recommendations for restructuring it. Faculty member Fred Gage and others note, however, that the review specifically did not address whether Pollard should stay on as president.

Last week's decision opens a new period of uncertainty for Salk, which has had trouble finding a leader ever since Frederick de Hoffman, its head for 18 years, stepped down in 1988. The problem, time and again, has been finding a topflight researcher who is willing to devote enough time to fund raising and administrative issues—precisely the fix that the Salk is in once again. A six-member search committee has begun scouting for Pollard's successor. "Pollard played an important role," says Heinemann. "Now we're going to look for a new type of leadership." If past is prologue, expect the Salk to try and find a Nobel laureate who is winding down his or her lab activities. **–JON COHEN**

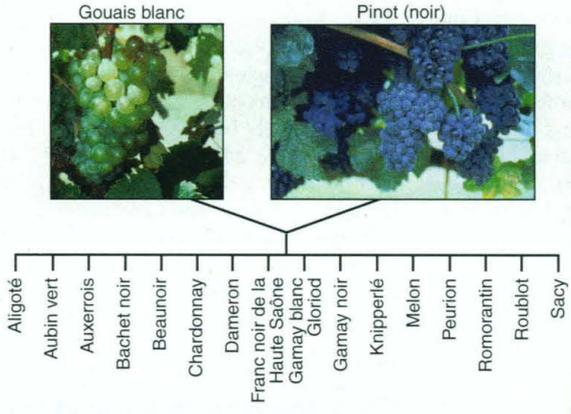
PLANT GENETICS

A Paternity Case for Wine Lovers

In vino veritas—the Romans had it right. In the more than 5000 years since humans began making wine, plenty of secrets have tumbled from lips it has loosened. Now, wine grapes themselves are spilling some intimate secrets—about their own parentage.

Using DNA fingerprinting techniques akin to those used to solve crimes and settle paternity suits, scientists at the University of California (UC), Davis, have shed some light on the fiercely disputed pedigree of a number of the world's most renowned grapevine varieties, or cultivars. As they report on page 1562, 18 varieties long grown in northeastern France—including Chardonnay, the "king of whites," and reds such as Pinot and Gamay noir—prove to be close relatives. Indeed, 16 of them turned out to be the offspring of a single, highly prolific pair of parents: Pinot, the very epitome of a fine Burgundy, and, surprisingly, Gouais blanc, an obscure white variety that was widespread in the Middle Ages but was banned several times in France, most recently in the 1950s, due to the poor quality of its wine.

James Luby, a fruit geneticist at the University of Minnesota, St. Paul, says the results "show the power of using genetic markers to clear up a conundrum that has been speculated about for decades, if not centuries." What's more, the findings are likely to cause a stir in the wine community. "This is quite a shocker," says grape geneticist Bruce Reisch of Cornell University's New York State Agricultural Experiment Station in Geneva. "No one would have imagined that all [these varieties] are from the same parents."



Proud parents. The prolific Burgundy ancestors Pinot and Gouais blanc sired 16 different offspring varieties, among them Chardonnay and Gamay noir.

The viticultural detective story has its roots in the early 1990s when Mark Thomas, a grape geneticist at the Commonwealth Scientific and Industrial Research Organization in Adelaide, Australia, and his colleagues developed a system to distinguish grape cultivars based on their so-called microsatellites. These consist of simple, repetitive sequences of DNA that vary in length between unrelated individuals, creating a genetic "fingerprint" that can tie crime-scene evidence to suspects and establish paternity—in both humans and wine grapes.

Thomas and others originally demonstrated the power of this technique by unraveling the parentage of Müller-Thurgau, the most widely cultivated white variety in Germany, developed around the turn of the century. Then, in 1997, plant geneticist Carole Meredith and her colleague John Bowers at UC Davis for the first time identified the parents of a traditional cultivar. They showed that Cabernet Sauvignon—undoubtedly the world's greatest and most successful red wine cultivar—is a progeny of two other classical Bordeaux varieties, Cabernet franc and Sauvignon blanc. Encouraged by their success, Bowers and Meredith, in collaboration with Jean-Michel Boursiquot of the Ecole Nationale Supérieure Agronomique and Patrice This of the Institut National de la Recherche Agronomique (INRA), both in Montpellier, France, decided to see if they could find the hidden family ties among 322 French grape varieties, some of which—such as Gouais blanc—are not even cultivated anymore and had to be retrieved from the INRA plant preservation collection.

Aided by a computer program Bowers developed for spotting microsatellite patterns shared by the cultivars, the researchers were able to construct what amounted to a Burgundy family tree, tracing the relationships of 18 varieties from that region. Pinot and Gouais blanc appeared to be the likely founders of the Burgundian line—a conclusion buttressed by statistical analysis, which showed that a Pinot-Gouais lineage is at least 10^{12} times more likely than any other combination for all 16 progeny varieties. "This makes it a pretty safe bet for Pinot and Gouais blanc," says Thomas. Because most, if not all, of the 16 siblings predate the times of deliberate grapevine breeding by hundreds of years, Meredith says the various crosses must have occurred spontaneously—and independently—by cross-pollination between Pinot and Gouais vines, most likely somewhere in northeastern France.

For wine purists, especially in France where new hybrid grape varieties are legally excluded from bearing the prestigious designation, "Appellation d'Origine Controllée" (AOC), the findings might be rather disconcerting. Says Alain Bouquet, a grape breeder at INRA, "The AOC system from 1934 was based on the assumption that varieties obtained by crossing are inferior to the traditional varieties. I think this is erroneous in the case of crosses between old European varieties, as it is now proven that the two best varieties in the world, Cabernet Sauvignon and Chardonnay, are derived from such crosses."

Indeed, Bouquet and his colleagues are now performing their own Pinot-Gouais crosses to see if they can recreate the successes of the original, spontaneous crosses. He expects the first miniharvest in 4 to 5 years. "Grapevine selection is a very long and costly process," he explains. The new results also show that the best grapes don't necessarily

CREDITS: (LEFT TO RIGHT) J. P. BRUNO, INRA DOMAINE DE VASSAL; CAROLE MEREDITH, UNIVERSITY OF CALIFORNIA, DAVIS

make the best parents. "It doesn't take two great varieties to produce a great progeny," says Meredith. Or as Luby puts it, "Even a scruffy bull can sire good offspring."

–MICHAEL HAGMANN

ASTRONOMY

Stellar Small Fry, or Runaway Planet?

Dark objects each the size of a dozen Jupiters could lurk in nearby space, a new discovery suggests. Maria Zapatero Osorio of the Canaries' Institute of Astrophysics in La Laguna, Tenerife, along with colleagues there and at the University of California, Berkeley, has found a mysterious object, dubbed S Ori 47, which defies easy classification: It may be too light to be a brown dwarf, the smallest kind of star, and could even be a giant planet drifting alone through space.

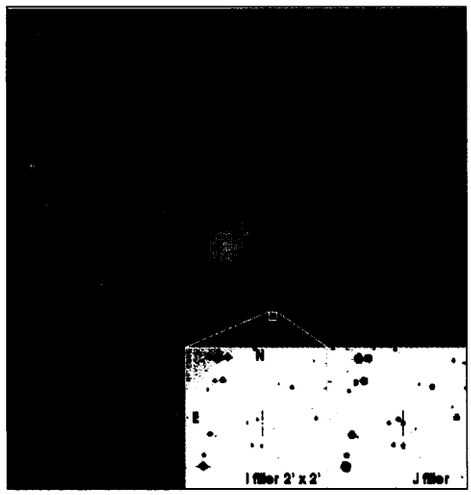
"This is the lowest mass object [beyond our solar system] ever imaged by astronomers," says Zapatero Osorio, who descibes the finding with her colleagues in a paper to appear in *Astrophysical Journal Letters*. S Ori 47 may be just 1.5% of the mass of the sun, or 15 times the mass of our own giant planet Jupiter. Whatever it is, it could be only one of many, as it is visible only because it is still glowing after its fiery birth. "There may be tens of them within 30 light-years from the sun," says Zapatero Osorio. "It's a very important discovery," says Kevin Luhman of the Harvard-Smithsonian Center for Astrophysics, who himself is hot on the trail of extremely low-mass objects. "It's discoveries like this that are developing an empirical picture of substellar objects." But he doubts that the objects are plentiful enough to account for the galaxy's "dark matter," the mysterious missing mass that seems to pull on the visible stars and gas.

Zapatero Osorio and her colleagues found S Ori 47 when they were observing a young star cluster in the constellation Orion. The stars in the cluster, 1100 light-years away, all formed just a few million years ago, so S Ori 47 is still glowing with the heat generated as interstellar gas collapsed to form it. The team studied it in detail using an infrared camera mounted on a 1.5-meter telescope at Teide Observatory on Tenerife in the Canary Islands, measuring its luminosity (0.2% of that of the sun) and surface temperature (some 1700 degrees Celsius). They estimated its mass by plugging these measurements into theoretical models of how quickly objects of different masses should cool and fade after their formation. The models are uncertain, says Zapatero Osorio, so the mystery object could be anything from 10 to 20 Jupiter masses.

That mass range straddles the dividing line between brown dwarfs and giant planets, which many astronomers put at about 13 Jupiter masses. Objects just above that mass—brown dwarfs—are not massive enough to ignite the hydrogen fusion furnace in their cores, but at some point during their lifetime they do burn deuterium (heavy hydrogen). However, anything less than 13 Jupiter masses is thought to be incapable of burning even deuterium and is considered a planet. Planets are also generally thought to form in the disk of material around a star, while stars can form directly out of a collapsing gas cloud. S Ori 47 may have formed as a solitary object, but it is equally likely to be an ejected planet.

Last year, Susan Terebey of the Extrasolar Research Corp. in Pasadena, California, claimed to have discovered an ejected planet on a Hubble Space Telescope photo. Although "there has been much skepticism about this particular claim, there's no reason why it couldn't happen," says James Liebert of the University of Arizona, Tucson. According to Liebert, the highly elliptical orbits that some extrasolar planets seem to follow around their parent stars can only be explained through the gravitational interactions of a third body in the system. "This can easily result in the ejection of a Jupiter-mass planet from the solar system altogether," he says.

Regardless of its true origins and nature—low-mass brown dwarf or rogue planet—S Ori 47 appears to be no astronomical oddity. "Currently, we're observing much fainter candidates in the same cluster," says Zapatero Osorio. Because all cluster members are roughly the same age, the fainter ones are probably even less massive. If the cluster is typical for the galaxy at large, space could be heavily populated with such objects. But their



Miniature mystery. Is S Ori 47 a star too small to ever burn or an ejected planet?

CREDIT: ZAPATERO OSORIO *ET AL.*, *AP. J. LETTERS*, IN PRESS; BEJAR *ET AL.*, *AP. J.* 521, 671 (1999)

ScienceScope

Steamed About Stem Cells A prominent biomedical advocacy group is taking some heat for failing to support controversial human stem cell research. In a letter last month to John Seffrin, CEO of the American Cancer Society, Stanford biochemist Paul Berg expressed "deep disappointment" over ACS's "recent action withdrawing its support for human embryonic stem cell research," which uses cells derived from embryos and fetuses.

The 26 August letter from Berg, head of the American Society for Cell Biology's public policy committee, was prompted by a 29 July *New York Times* report that influential Catholics had pressured ACS into withdrawing its endorsement of Patients' Cure, a group advocating stem cell research. It was "shocking," Berg wrote, that ACS had failed to join with other groups calling for federal funding of such work.

But Berg has it wrong, says Greg Donaldson, ACS vice president of public relations in Atlanta. Although ACS isn't backing Patients' Cure, he says "nothing could be farther from the truth" than the claim that ACS withdrew its support for stem cell research. "How could we, when we haven't formulated a policy yet?" he asks. Though ACS joined other groups in May to urge Congress not to ban stem cell research, he says staff are still "engaged in a deliberate internal dialogue" on its policy.

Whose Mummy? Researchers and Native Americans are at odds over the fate of Spirit Cave man, a 9400-year-old mummy. Found in 1940 about 90 km east of Carson City, Nevada, the mummy is the oldest documented North American yet. First presumed to be less than 3000 years old, the remains were carbondated after being rediscovered in storage at the Nevada State Museum in Carson City in 1994. The new date sparked a flurry of research, as well as demands from the Fallon Paiute-Shoshone tribe, which wants to bury its alleged ancestor.

Scientists are keen to do a DNA probe on the Spirit Cave bones, but the government has forbidden any invasive procedures pending a custody decision. Both sides are pleading their case to the federal Bureau of Land Management (BLM), which will make the decision. In the meantime, scientists eager to see whether Spirit Cave man sheds light on the peopling of the Americas are on tenterhooks. Says University of Nevada archaeologist Eugene Hattori: "Everyone is waiting for BLM."

Contributors: David Malakoff, Eliot Marshall, Constance Holden