at the law firm Fenwick and West in San Francisco, California. “Every judge gets to decide: Is this the kind of thing that I think a patent claim ought to cover?”

To bolster its arguments, CLS Bank is citing a 2012 case, *Mayo Collaborative Services v. Prometheus Laboratories*, that struck down two medical-diagnostics patents and sent tremors through the diagnostics industry. The patents covered the act of measuring metabolites to determine the proper dosage of certain drugs used to treat autoimmune diseases. The nine judges on the Supreme Court unanimously decided that the patents merely laid claim to a law of nature — the body’s breakdown of the drugs — and were therefore invalid.

The *Mayo* ruling represented a fundamental change, says Brian Dorn, a patent attorney at the Barnes & Thornburg law firm in Minneapolis, Minnesota, who counts diagnostics companies among his clients. “It’s been hard to get around,” he says. “We’ve been getting patent rejections based on that case.” Some even blame the court’s decision for a drop in US venture-capital investment in medical-diagnostics companies — from US\$395 million in 2011 to \$278 million in 2013, according to London-based consultancy firm PricewaterhouseCoopers.

Mayo is also setting a precedent for lower courts. Last October it was used, along with the 2013 *Association for Molecular Pathology v. Myriad Genetics* ruling that invalidated patents on genes (see *Nature* 498, 281–282; 2013), to throw out key patents on a prominent non-invasive prenatal test for Down’s syndrome, held by the diagnostics company Sequenom of San Diego, California. The ruling, by a California district court, used a strict interpretation of *Mayo*, says Christopher Holman, a law professor at the University of Missouri–Kansas City Law School. “If that is how the courts are going to use that case, it’s a very bad sign for industry,” he says.

The *Alice* case could be a chance for the Supreme Court to clarify how *Mayo* should be interpreted, says Masur: rulings on abstract ideas (as is likely to arise from *Alice*) are often applied to arguments about patenting laws of nature (as in *Mayo*). If the Supreme Court invalidates many kinds of software patents, for example, diagnostics firms could be in for more trouble, he says.

The Supreme Court’s tendency towards restricting patents is a concern for Gregory Graff, an agricultural economist who studies intellectual property at Colorado State University in Fort Collins. He argues that the US patent system should not be reformed through a series of radical court decisions. Instead, he would prefer to see legislation and patent-office procedures tweaked as fields of technology evolve. “You don’t need the nuclear option of blowing a hole in what’s deemed patentable,” he says. ■

Conservation work under the Great Pompeii Project began at the site in 2013.

ARCHAEOLOGY

Sister city inspires Pompeii rescue

Archaeologists hope that funding and conservation boost can halt decay of ancient city.

BY DECLAN BUTLER

Ancient Pompeii, which suffered three wall collapses this month, may look to its smaller sister city Herculaneum for tips to ensure its survival. Both cities, located on Italy’s Neapolitan coast, were simultaneously destroyed and preserved by the eruption of Mount Vesuvius in AD 79, but the historic site of Herculaneum is faring much better, thanks to a sustainable conservation project.

Now an international research consortium is planning a similar pilot scheme for Pompeii. And researchers and officials are hoping that a €105-million (US\$145-million) European Union project to restore Pompeii will also draw on lessons from Herculaneum.

The rescue plan cannot come soon enough. “A lot of buildings are at risk [of collapse],” one anonymous observer close to the restoration efforts told *Nature*, adding that, as well as the repair effort, “they need a system to maintain the site so that it doesn’t happen again”.

Excavations of Pompeii, which, with Herculaneum, is a World Heritage Site of the United Nations Educational, Scientific and Cultural Organization, began in the mid-eighteenth century. But conservation took off

only in the early twentieth century, by which time much of the city had been reduced to walls. However, decay at the 66-hectare site has accelerated since the 1960s as a result of haphazard funding and the disbanding of in-house maintenance crews.

This month’s collapses are the latest in a series of incidents since the 1980s. Water is the site’s biggest enemy: unexcavated embankments absorb rainfall and exert pressure on adjoining structures, and poor drainage allows surface water to accumulate. A lack of regular repair work means that rain also seeps into the walls.

Much of Pompeii’s masonry consists of rubble stonework, which is highly vulnerable. Typically, this consists of two wall coverings assembled with roughly placed stones of volcanic tuff (*opus incertum*), together with a core of smaller stones set in a lime-mortar grout (*opus caementicium*).

Such constructions show excellent longevity if kept dry. But water infiltration has led to repeated wetting and drying, causing stones to chip and flake, and the mortar to decay and lose cohesion. In addition, many twentieth-century conservation interventions at Pompeii have since proved inappropriate and damaging.

The authorities are responding, however. ►

► In February 2013, the European Union and the Italian government launched an emergency €105-million project to reverse the decades of neglect. Dubbed the Great Pompeii Project, it focuses on draining and securing embankments, restoring masonry and decorated surfaces, and protecting buildings from weathering. But the project, the budget for which must be spent by the end of 2015, has been beleaguered by concerns that delays and bureaucracy may affect the quality of the work. In response, the European Commission said on 6 March that it will carry out an urgent public review of progress.

Johannes Hahn, the European commissioner for regional policy, says that the review's aim is clear. "We have professionals working on the site. The most helpful thing we can do for them is to remove the bureaucratic barriers and let them get down to work."

Massimo Osanna, appointed this month as head of the Special Superintendency for the Archaeological Heritage of Naples and Pompeii, which is in charge of the site's conservation, says that although a longer time frame would be preferable, criticism of the pace of progress is unfair. High-quality archaeological conservation of an open-air site as vast as Pompeii inevitably has long lead times, he argues, and plans for using the money are already well under way.

Having a proper plan for the sustainable management of Pompeii is also a major issue. The outsourcing of routine maintenance to contractors since the 1980s has had severe effects,

with repeated delays to urgent repairs, says Andrew Wallace-Hadrill, a social and cultural historian at the University of Cambridge, UK.

Wallace-Hadrill heads what many see as a model for conserving Pompeii: the Herculaneum Conservation Project (HCP). This was launched in 2001, when Herculaneum was in a dire state, as a public-private venture between the philanthropic Packard Humanities Institute of Los Altos, California, the British School at Rome and the superintendency. In just over a decade, and having spent €20 million in total, it has helped to reverse the decay and put the town on a sustainable conservation footing (see 'Under a shadow').

"I'm impressed; Herculaneum was a very sad, dirty and abandoned place; now it's fantastic,"

says Albrecht Matthaei, an archaeologist at the Roma Tre University. Although under the jurisdiction of the superintendency, the HCP's level of autonomy frees it from state bureaucracy, notes Wallace-Hadrill.

The HCP also brings together archaeologists, engineers and other scientists with conservators. This, together with an emphasis on routine maintenance, has been key, says Wallace-Hadrill. And the project differs from the typical conservation practice of carrying out complete restorations on a house-by-house basis by focusing on urgent site-wide restorations and repairs.

Now, a proposed project, the Pompeii Sustainable Preservation Project (PSPP), is taking inspiration from the HCP. An international consortium of research institutions, including the Fraunhofer research organization and the Technical University of Munich in Germany, hopes to raise US\$10 million in philanthropic funding to launch a ten-year pilot project later this year that will study long-term, sustainable conservation and restoration approaches at Pompeii. "HCP is best practice," says Matthaei, a coordinator of the PSPP. The new project seems laudable, but until work begins it is difficult to assess, adds Wallace-Hadrill.

Osanna says that Pompeii's greater size makes comparisons with the HCP difficult. But he is confident that the Great Pompeii Project can fix the city. "People need to give the project time to get up to speed, after which any controversy will hopefully be put to rest," he says. ■

POLITICS

Chile puts plan for science ministry on hold

Government rethinks former president's bid to create first unified science department.

BY MICHELE CATANZARO

The new government of Chile has shelved plans to create the country's first science ministry, disappointing thousands of researchers who had campaigned for it.

Former president Sebastián Piñera submitted plans for the ministry to the Senate on 7 March — days before leaving office — in response to long-standing demands by several Chilean scientific organizations. The plans were part of a last-minute legislative package that included three other, unrelated laws.

But now, politicians supporting new president Michelle Bachelet, who was sworn in on 11 March, have derailed the proposal. Senator

Jaime Quintana, spokesman for the centre-left New Majority coalition that backs Bachelet, said that the draft laws "are not legitimate" because to enact them would require money that the current government intends to allocate to its own priorities.

"It is a regrettable situation: it was a hard fight until we got the draft law, and now we feel a big discomfort," says Eduardo Bravo, director of the National Association of Postgraduate Researchers in Santiago, which was among the organizations that had called for the science ministry.

Chile is a small but highly productive player in Latin American science. In 2010, it spent US\$1.15 billion on research and development.

Although that is equivalent to just 0.44% of its gross domestic product, or 2.8% of Latin America's total investment in science, the country ranks behind only Brazil, Mexico and Argentina in terms of the number of articles published.

However, science governance in Chile is currently spread across the ministries of education, economy and agriculture. "This has resulted in multipolar governance that has not been capable of establishing a clear agenda of strategies and priorities, or strong networks of scientists," says Jesús Sebastián Audina, a researcher in science policy at the Spanish National Research Council in Madrid.

Jorge Babul, president of the Chilean Council of Scientific Societies in Santiago, adds: