



Moment of truth. Defendants Claudio Eva (center) and Bernardo De Bernardinis (center right) await the verdict this week.

SCIENCE AND THE LAW

Prison Terms for L'Aquila Experts Shock Scientists

L'AQUILA, ITALY—In a decision that has sent shock waves through the scientific community, a judge in this central Italian town has handed down manslaughter sentences of 6 years to each of seven experts who gave advice ahead of the deadly earthquake that struck here in 2009. The four scientists, two engineers, and a government official were accused of having carried out only a superficial analysis of seismic risk and providing false reassurances to the public ahead of the quake, which killed 309 people. The lawyers for those convicted say they will appeal the verdict.

Alfredo Biondi, the defense lawyer for one of the seven, Claudio Eva, a seismologist at the University of Genova, says the verdict was “extremely mistaken.” He added: “When someone says how things are, they shouldn’t end up in jail for 6 years.”

Following a yearlong, highly emotional trial (*Science*, 12 October, p. 184), local residents welcomed the verdict. “I think it is truth and justice,” says Vincenzo Vittorini, who lost his wife and daughter in the quake. “It wasn’t a trial against science; it was a trial against those who didn’t know how to evaluate the risk, who didn’t know to mitigate the risk.”

But scientists, thousands of whom signed

petitions or sent letters protesting the pre-trial investigation, are mostly appalled by Judge Marco Billi’s decision. “It’s incredible that scientists trying to do their job under the direction of a government agency have been convicted for criminal manslaughter,” says earth scientist Thomas Jordan of the University of Southern California in Los Angeles. “We know that the system for communicating risk before the L’Aquila earthquake was flawed, but this verdict will cast a pall over any attempt to improve it. I’m afraid that many scientists are learning to keep their mouths shut. This won’t help those of us who are trying to improve risk communication between scientists and the public.”

“If it stands, this verdict will have a chilling effect on earthquake science in Italy and throughout Europe,” said Sandy Steacy of

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**—SANDY STEACY,
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the University of Ulster, Coleraine, in the United Kingdom, in a statement. “For instance, who would now be willing to serve on an earthquake hazard evaluation panel when getting it wrong could mean a conviction for manslaughter?”

All seven defendants took part in a meeting of Italy’s National Commission for the Forecast and Prevention of Major Risks that was held in L’Aquila on 31 March 2009, 6 days before the quake struck. They are: Franco Barberi, a volcanologist at the University of Rome (Roma Tre); Enzo Boschi, a geophysicist at the University of Bologna; Gian Michele Calvi, a seismic engineer at the University of Pavia; Eva; Mauro Dolce, a seismic engineer at Italy’s Civil Protection Department (DPC); Giulio Selvaggi, a seismologist at Italy’s National Institute of Geophysics and Volcanology (INGV); and Bernardo De Bernardinis, a hydraulic engineer who in 2009 was deputy head of DPC.

The prosecution alleged that the information provided by the experts led many people to stay indoors in the early hours of 6 April 2009 rather than seek safety outside. The men were not being charged with having failed to predict the exact time, place, and magnitude of the deadly quake but with having made a series of “banal and self-contradictory” statements during their 2009 meeting, many of which were “at best scientifically useless” or, worse, “misleading,” said public prosecutor Fabio Picuti.

Among the most controversial statements were those made by De Bernardinis in a television interview ahead of the meeting. The DPC deputy head said that the ongoing tremors posed “no danger” and that “the scientific community continues to confirm to me that in fact it is a favorable situation,” because the ongoing tremors helped discharge energy.

In response to the prosecution’s charges, Boschi’s lawyer, Marcello Melandri, was keen to distance the statements of De Bernardinis from those of the rest of the commission, telling the court that, according to Picuti, “De Bernardinis suddenly becomes a prophet” insofar as he made his infamous comments before and not after the meeting. Barberi’s lawyer, Francesco Petrelli,

meanwhile, said in a press interview after the meeting, it was “impossible” to regard as reassuring comments on the unpredictability of earthquakes made by his client, De Bernardinis’s advocate, Filippo Dinacci, also emphasized the impossibility of predicting earthquakes. “We are asking the conviction of seven Christians just because an event happened,” he told the court.

Responding to this point shortly before the verdict, prosecutor Picuti argued that the defense failed to distinguish between a natural disaster and the risk of such a disaster. While an earthquake is not possible to predict, he said, its risk can be predicted. That logic, he maintained, is borne out in the very name of the commission.

The conviction has stunned many Italian scientists. “I am upset and really shocked” was the reaction of Warner Marzocchi, chief scientist at INGV. “I want to understand why we have arrived at this verdict,” he says. “It is hard to know what to do in similar situations in the future.” Paolo Scandone, a geologist at the University of Pisa and a member of the Major Risks Commission in the 1980s, says that he feels “deep sadness” at the verdict. But he is nevertheless critical of modern risk assessment in Italy. He argues that in decades past, scientists were “aware of their role” in such assessments and that there was what he calls “a moral tension” among scientists. That tension, he maintains, no longer exists.

Following this week’s verdict—during which Billi also awarded victims €7.8 million in compensation—the judge has up to 90 days to deposit a document explaining his reasoning, and the defense will then have 45 days to lodge an appeal. But with two or even three stages, says civil party lawyer Fabio Alessandrini, the appeals process could last up to 6 years. After the verdict, De Bernardinis said in a statement: “I consider myself innocent before God and men. My life will change from tomorrow onwards, but if my responsibilities are demonstrated in all the levels of appeal I will accept them completely.”

Willy Aspinall, a risk expert at the University of Bristol in the United Kingdom, describes the prison terms as “distressing and alarming” but nevertheless believes the trial points to a number of “salutary lessons.” He says that analysis of natural hazards needs to be “much more formalized and structured,” with advice contained in a written document and “off-the-cuff remarks” avoided. He also warns that scientists will “need to become much more litigation aware.”

—EDWIN CARTLIDGE

Edwin Cartledge is a science writer in Rome.



SCIENTIFIC INTEGRITY

Questions About Japanese Researcher Go Back Years

A startling case involving a groundbreaking stem cell experiment by an unknown researcher, a bogus Harvard affiliation, and multiple collaborators who appear to have signed their names to papers they knew little about is raising questions about the research enterprise and just how easy it can be to pretend you’re someone you’re not in the world of science.

At the center of the storm is Hisashi Moriguchi of the University of Tokyo Hospital, whose career today stands in tatters. Earlier this month, he admitted to lying about a series of stem cell-based transplants in humans. At least three journals are investigating his papers on stem cells, hepatitis C, and other topics. On many publications, he falsely claimed affiliations with Harvard Medical School and Massachusetts General Hospital (MGH) in Boston as far back as 2002. Two major Japanese institutions that supported Moriguchi’s work have launched inquiries. And Moriguchi has been fired.

In a 2-hour interview with *Science* in a Tokyo hotel last weekend, Moriguchi admitted he had made mistakes but insisted he has had a long-standing affiliation with Harvard, despite strenuous denials from that institution. He also said he participated in the stem cell transplants thrown into question, although on only one patient as opposed to the six originally claimed.

Moriguchi perpetuated his alleged fraud

for at least a decade, but it grew more elaborate in recent years. He persuaded many others to sign on to his papers and allegedly convinced a Harvard gastroenterologist to file a patent on his behalf. In Japan, there are questions about Moriguchi’s possible misuse of research funds. He was brazen: On seven papers co-authored with the gastroenterologist, Raymond Chung, he claimed that he was a member of Chung’s own department at MGH.

At least a couple of Moriguchi’s co-authors say they often did not read the publications on which their names appeared or did not see them in their final form, thereby never catching the false Harvard affiliation. Some co-authors say they were unaware that Moriguchi was using their names. His supervisor at the University of Tokyo Hospital, surgeon Makoto Mihara, thought his claimed stem cell work occurred in the States, according to the hospital’s public relations center. In his interview with *Science*, Moriguchi said he was flying solo, performing stem cell research—but no clinical work—on his own in a rented facility in the Boston area and financing the work out of his own pocket.

The story broke on 11 October, thanks largely to Moriguchi himself. He was attending the annual translational research conference of The New York Stem Cell Foundation in New York City, where a poster of his was