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## 5 Editorial/Editoriale

On the Witness Stand: Environment Crises,  
Disasters and Social Justice

7 Mara Benadusi, Sandrine Revet, *Disaster trials: a step forward*

17 Mara Benadusi, *The Earth Will Tremble?*  
*Expert Knowledge Confronted after the 2009 L'Aquila Earthquake*

33 Andrea F. Ravenda, «*We are all the injured party*»:  
*activism and the right to health in an industrial pollution trial*

51 Sandrine Revet, *La tempête au tribunal.*  
*Trajectoires de victimes et de prévenus au cours du procès de la tempête Xynthia en France*

65 Antonello Ciccozzi, *Forms of truth in the trial against the*  
*Commission for Major Risks: Anthropological notes*

83 Irene Falconieri, «*Forseeable yet unforeseen events*»:  
*Ethnography of a trial for unpremeditated disaster*

## Ragionare

97 Alessandro Mancuso, *Antropologia, "svolta ontologica", politica*

## 133 Leggere - Vedere - Ascoltare

## 139 Abstracts



Mara Benadusi

# *The Earth Will Tremble?*

## *Expert Knowledge Confronted after the 2009 L'Aquila Earthquake*

### *Introduction*

In the last thirty years, there have been more and more opportunities for social scientists to participate in «global assemblages» (Collier, Ong 2005: 4-5) in which ethical and political reflections, knowledge, technicalities and disaster intervention strategies are developed together (Benadusi 2015). Leading figures in the field such as Anthony Oliver-Smith, the founding father of the anthropology of disaster, have carved out a space of involvement for themselves not only among the communities and organizations they interact with in the field, but also as part of decision-making bodies tasked with developing policies for reducing disaster vulnerability. They have provided advice to governments, administrations and organizations such as the World Bank, UNISDR (United Nations International Strategy for Disaster Reduction), ICSU (International Council for Science) and the United Nations University. In so doing, sociologists, geographers and anthropologists have contributed to a paradigm shift in the understanding of disasters and the move from a technocratic, top-down and centralized approach to managing risk to more community-oriented, participatory and bottom-up approaches (Lavell et al. 2013: 429).

Social scientists are also beginning to play a role (albeit still limited, compared to other academic disciplines) in the legal procedures for determining public or private responsibility for the consequences of catastrophic events. The judicial controversy following the L'Aquila earthquake of April 6, 2009 is a clear example of the presence of social scientists in the courtroom as part of trials in some way connected to disasters. Indeed, risk communication the Italian Commission for the Forecast and Prevention of Major Risks – the Commission for Major Risks (hereafter CMR) – provided during the days prior to the earthquake resulted in a controversial court case involving representatives of the scientific community from outside the disciplines most commonly consulted in relation to forensic issues. Sociology and anthropology played a central role in this trial, the

same kind of role ballistics, clinical psychology, medicine and the physical and engineering sciences have played in other court cases. The trial has had significant repercussions at the international level and stimulated an intense debate about the relationship between scientific knowledge and risk communication, and more generally between science and politics. In addition, it was the first time in a trial for determining scientific and institutional responsibility associated with disaster that an anthropologist acquainted with the facts was called in to provide technical counsel, contributing to the prosecution's case. As I will describe in more detail later in the article, Antonello Cicozzi's anthropological analysis demonstrated how the communication provided by the experts convened in L'Aquila led the local population to underestimate the degree of risk, thereby causing them to engage in life-threatening behaviours.

The trial being already concluded, this article seeks to re-interpret the L'Aquila court case in order to analyse the role that scientific knowledge played in the courtroom. I consider both the expert advice provided by accused scientists and the consultation provided by outside experts, in particular the anthropologist, during the trial proceedings. The article builds on an initial comparison of the 2009 L'Aquila and 1981 Lima predictions, two cases in which scientists played a central role in assessing the likelihood of a significant earthquake. Through this comparison, I identify the shifts in the seismological community and political sensitivity regarding earthquakes that helped to lay the groundwork for the explosion of litigation following the L'Aquila earthquake. Intense media coverage also provided the backdrop to both events. I then examine the L'Aquila case in more depth to show the role played by expert knowledge in the two stages of legal proceedings, the judgment of first instance and the Court of Appeals judgment, analysing the relative weight attributed to anthropological consulting during the first part of the trial as compared to the second part. In the final section, attention is focused on the link between science and politics that played a

central role in the unfolding of forensic procedures. I also argue for the importance of strengthening integrated research in the study of disasters and promoting a more substantial incorporation of socio-anthropological knowledge when identifying the best strategies for effective risk communication.

*Comparing two predictions: Lima-1981  
and L'Aquila-2009*

The history of earthquake predictions includes moments of particularly heated controversy. Indeed, due to their surrounding political and institutional environment, some predictions undeniably have a greater impact than others; they are capable of inciting acrimonious debates in scientific circles and generating powerful repercussions in terms of international public opinion. One example that is "good to think with" is that of the devastating quake forecasted to take place in Lima, Peru, in 1981. Two American scientists made this prediction: Brian Brady from the U.S. Bureau of Mines and William Spence from the U.S. Geological Survey, who predicted the earthquake with a high degree of exactness, indicating a precise location, magnitude and day for the catastrophe. The disaster never occurred. The Brady-Spence forecast, however, became part of the history of modern seismology. The earthquake could have been one of the most violent of the twentieth century and, at the time, the area it was predicted to hit hosted more than five million inhabitants. According to the scientists' calculations, the earthquake could have killed hundreds of thousands of victims. This story with all of its political implications has been reconstructed in a dense account by Richard Stuart Olson, Bruno Podesta and Loanne M. Nigg, *The politics of earthquake prediction* (Olson *et al.* 1989). The authors describe how scientists and the two governments involved, the United States and Peru, worked to mitigate the consequences of the potential earthquake. The result is a detailed portrait of the way scientists, bureaucrats and media outlets interact in cases of immense scientific controversy.

Why discuss the 1981 Brady-Spence prediction? I believe this controversial case helps us better understand what happened in Italy with the main focus of my paper, the earthquake that destroyed the city of L'Aquila on April 6, 2009. Indeed, the scandal ignited by Brady and Spence's erroneous calculations in the 1980s offers a lens for interpreting the events of thirty years later involving the Commission of Major Risks, an institutional body tasked with preventing and predicting earthquake risk in Italy.

At the time of Brady and Spence, deterministic

prediction research was seen as a growing sector of seismology with the potential to produce decisive discoveries for the wellbeing of humans worldwide (Geller 1997). This branch of predictive science was based on accumulating knowledge about tectonic plates and analysing certain signs that were considered premonitory, such as radon gas emissions and precursory tremors. In contrast, the trial against the CMR in L'Aquila unfolded in a completely different context. At this point, in fact, it is widely agreed that deterministic-type predictive discoveries are still a long way off. This is why, in the contemporary political climate, it is considered essential for risk-assessment agencies to assert that the science of seismology is not capable of unambiguously determining the exact occurrence of earthquakes; at best, it can provide guidance based on probability that is reliable in the long term (from years to decades). In other words, to date there are no earthquake warning signs that can be considered adequate evidence for predicting the exact place and time earthquakes will occur<sup>1</sup>.

This point helps to make sense of the way the scientific community and institutional bodies reacted to the forecasts made by the technician Giampaolo Giuliani a few days before the L'Aquila earthquake. Giuliani<sup>2</sup> had circulated information among the population regarding the imminent occurrence of a severe earthquake in the L'Aquila area. Then, on March 27, he warned the mayor about the possibility of an earthquake occurring within the next 24 hours, a tremor that did in fact take place. A few days later, he went public with a second prediction, calling the mayor of the nearby town of Sulmona to warn him about another tremor that was forecasted to take place there in the next 6-24 hours. The quake did not take place on the expected day, however, and Giuliani was sued for sounding a false alarm (Alexander 2010). The reactions to Giuliani's predictions<sup>3</sup> should be read not only in light of the distinction between science and non-science (Gieryn 1999) that conditions the credibility of those expressing scientific opinions. They should also be read in light of the important changes that have occurred in the geophysical sciences from the 1980s to the present, that is, the clear decrease of confidence in seismology's ability to predict seismic events, especially when such forecasts are based on deterministic methods of analysis.

This shift is not only due to scientific factors, however. Cases like the earthquake predicted in Lima have generated a growing consensus about the dangers such forecasts pose in terms of their potential social and economic effects: panic and anxiety in the population and decisions made out of fear as well as falling real estate values, plummeting

rents, decreasing touristic flows and increasing insurance rates. All of these effects were observed after the Brady-Spence forecast. The then-president of the Peruvian Geophysics Institute wrote that «the prediction itself can cause damage comparable to the effects of a large earthquake» (Olson *et al.* 1989: 35). One of the two scientists, Brady, mindful of the effects his calculations could have on the public, was even afflicted by a «professional dilemma» (*ibidem*: 17) about whether to publish the results of their studies publically or disseminate them only in restricted settings. Tellingly, the authors of the report speak of a «policy of ambivalence» (*ibidem*: 50): on the one hand, the prediction was circulated widely at the public level, mainly as a result of the echo chamber effect generated by the national media in Peru; on the other hand, all possible measures were taken to not render the findings official at the institutional level, even while the necessary preventive and mitigative measures were recommended (and partly adopted).

Guido Bertolaso, the head of Italian Civil Protection Department in 2009, was seemingly aware of the political slipperiness surrounding earthquakes (and the socio-economic costs of a possible prediction). On convoking an urgent techno-scientific meeting in L'Aquila with influential members of the national geophysics community and technical experts working for the Italian Civil Protection Department<sup>4</sup>, he warned them that the earthquake had become «a minefield»<sup>5</sup>. It was Bertolaso's intention that emphasizing a message of earthquake non-predictability with the citizens of L'Aquila would prevent Giuliani's statements from causing locals to engage in the kind of behaviour that occurred in Lima or other similar situations. The representatives of the institutional bodies were therefore fully aware of the persuasive weight scientific recommendations can have on the citizenry by reconfirming or altering local perceptions of seismic risk. The fact that the Italian Civil Protection Department specifically wanted to avoid reactions dictated by panic or the kind of effects caused by alarmist predictions shows that it was well aware of science's capacity to influence how people actually react.

The juxtaposition of these two cases (Lima and L'Aquila) gives rise to questions with unmistakable public relevance. What would be the most suitable, useful and, above all, responsible risk communication to provide to the public under such circumstances? Is it better to give a clear and transparent message, or an ambiguous one that leaves room for reassurance? When the political need to underline that science cannot provide valid seismic predictions is combined with the necessity

of calming the population, what are the effects? And how do these effects impact on the disaster risk reduction sciences or, even more so, on risk communication? These questions point to the heart of a «communicational dilemma:» is it better to sound an alarm or run risks? When in doubt, what is to be done? Comparing Lima-1981 and L'Aquila-2009, what emerges is the «yawning gap between scientific knowledge, mass communication and the social need for security» (Clemente 2013: 7). Despite the passage of time separating these two cases, this gap has yet to be bridged.

In the next section, I outline the case of the L'Aquila legal proceedings in order to aid in responding to at least some of these questions. As David Alexander's work shows (2010, 2014), one possible interpretation of the affair involving the CMR in L'Aquila is that the chain of information provided to citizens was so incongruous as to give rise to the absurd «prediction of a non-earthquake». Framed in these terms, the similarity between the Lima and L'Aquila cases is even more explicit. In Lima, scientists forecasted a disaster that never occurred, while in L'Aquila the population was provided with information about a non-disaster that actually did occur. In the lengthy legal proceedings following the quake, the technical experts and scientists summoned to L'Aquila were not accused of giving a false alarm (as occurred with the Brady-Spence prediction), or even of failing to sound an alarm. The accusation was that they had inappropriately reassured the population to the extent of maintaining a highly contradictory position: essentially, they continued to claim that «there is no way to predict earthquakes, but we predict a non-earthquake». To assert that the continuing signs of an imminent quake (namely the lengthy seismic swarm and anticipatory tremors) should not be taken as premonitory indicators, they went so far as to paradoxically state that these were perfectly normal, neutral events or even positive signs that energy was being released and so it was unlikely a major earthquake would strike the city<sup>6</sup>. Not a failure to alarm but rather «reassurance-ism», that is, an inaccurate and deadly judgment that there was no substantial danger. This is the argument of the anthropologist Antonello Ciccozzi, who was called as an expert to provide technical consultancy as part of the trial; the same argument was also supported by Judge Marco Billi during the first trial, which led to a guilty verdict (Billi 2012).

Thirty years separate the erroneous Lima earthquake prediction and the equally inaccurate forecast of a non-earthquake in L'Aquila. In a highly seismically active country such as Italy, the relevant institutions probably thought it was best to avoid

spreading panic, to elude the costs of a potential evacuation, to reinforce citizens' trust in governmental bodies and delegate to them the management of potential calamities. To this end, they used the authority attributed to the scientific commission. According to the proceedings leading up to the first ruling, however, this choice was made at the expense of accurate information about risk (*ibidem*).

The Lima-L'Aquila comparison also raises other considerations. Both cases clearly show how the science of disasters, perhaps more than other disciplines, is currently «on stage» and under the spotlight (Hilgartner 2000). This is why it easily runs the risk of being politically manipulated. Both cases had broad mediatic reverberations and generated a significant echo in public opinion. However, while in the first case a scientific commission made up of fellow experts was called to judge the actions of the two American scientists outside of the courtroom, in the L'Aquila case a real legal action was brought. The scientific trial regarding Brady and Spence's prediction, which took place before the fateful date when the earthquake was supposed to have struck, did not involve assessing legal responsibility, although it did seriously compromise the reputations of the two scientists. In the case of the CMR in L'Aquila, in contrast, it was precisely the responsibility of scientists that was put on trial after the earthquake, in view of the possible social effects of an opinion, and its associated risk communication, that might have contributed to causing the death of some earthquake victims. This does not detract from the fact that the level of spectacle accompanying the story in both cases was outrageous and excessive, leading to outcomes we might term «dramaturgical».

Lima and L'Aquila also differ in another detail. In addition to the public institutions involved, Brady and Spence essentially faced fellow geoscientists and risk management specialists during the unfolding of the events in Lima. The CMR members were instead evaluated by a wider collection of actors and entities. Indeed, knowledge about disasters and their associated risks is no longer considered the exclusive domain of geophysics. Sociology, anthropology and communication studies were brought into the L'Aquila case on the same level as techno-scientific knowledge<sup>7</sup>. This is clearly demonstrated by the role anthropologist Antonello Ciccozzi played in the first trial on the side of the prosecution, and the communication sociologist Mario Morcellini on the side of the defence<sup>8</sup>. These roles illustrate how the science of disaster is now held to a much broader scope of public accountability than it was in the era of the Lima prediction.

### *Scientists in the courtroom: disputed advice*

As consulting anthropologist, Antonello Ciccozzi wrote a technical report for the Italian public prosecutor's office titled *Rassicurazionismo: Antropologia della comunicazione scientifica nel terremoto dell'Aquila*, «Practicing reassurance: an anthropology of scientific communication in the L'Aquila earthquake» (Ciccozzi 2013). In this report, he reviews the official judgment of «no substantial danger» released by the experts of the CMR and argues that this judgment exacerbated the tragic consequences of the earthquake. In drafting his report, Ciccozzi mainly draws on the anthropology of risk (Douglas 1992; Douglas, Wildavsky 1980) and social representations theory (Moscovici 2000). His main source of documentation is the testimony that the Public Prosecutor collected from victims' relatives during the pre-trial phase. Ciccozzi analyzes the link between institutional communication and collective behavior. Specifically, he examines how the CMR's judgment regarding the seismic danger facing the city of L'Aquila affected the «local anthropological culture», persuading a segment of the population to stay at home the night of the earthquake. Indeed, he argues that the CMR's reassuring statements clashed with the precautionary norms of local culture, which had been shaped over time by previous earthquake experiences. Ciccozzi's expert advice thus falls into the category of «cultural expertise» aimed at describing the facts to be considered when evaluating legal responsibility in light of the specific background of one of the disputants; the idea was that this advice would have supported the arguments presented by the defence or prosecution and thereby contribute to the formulation of the final ruling (Holden 2011: 2-3).

As summarized in the article included in this special issue (Ciccozzi *infra*), Ciccozzi's anthropological outline of the events unfolds as follows: according to the «seismic culture» of the city, L'Aquila locals were inclined to interpret the series of tremors that rocked the city between the winter and spring of 2009 as a prelude to potential catastrophe. The fact that residents spontaneously evacuated their homes during every one of the strongest tremors before April 6<sup>th</sup> is proof of this tendency. Following the lengthy earthquake swarm that culminated in more intense shakes on the 30<sup>th</sup> of March, however, the emergency meeting of the CMR was called in L'Aquila by then-president of the Italian Civil Protection Department, Guido Bertolaso<sup>9</sup>. Ciccozzi argues that the appointed scientific experts provided «imprecise, generic and ineffective» information before, during and after

this meeting and that this information reduced the population's perceptions of risk. And this, he claims, caused an «increase in the vulnerability of the local area, that is, a contributing factor that led to the disastrous consequences of the seismic event» (Ciccozzi 2013: 37). In passing his guilty verdict, Judge Marco Billi (2012) fully embraced Ciccozzi's anthropological argument.

In the first instance trial, the CMR members were accused of multiple manslaughter and sentenced to six years in prison, excluded from public office and required to pay the victims damages of up to 450,000 Euros. This first verdict triggered heated debates in the scientific world as well as among politicians and local civil society. To understand the trial ruling, however, it is essential to note that the CMR was established by the Prime Minister as a technical-scientific consulting body of the Italian Department of Civil Protection (Law n. 225, 24/02/1992<sup>10</sup>). It is therefore essentially an institutional commission that performs a public role on behalf of the State. The commission is composed of «nationally and internationally famous, undisputed and publically recognized figures with proven experience in the field of civil protection»<sup>11</sup>; and it is specifically tasked with providing expert opinions and guidelines for «forecasting and preventing major risks»<sup>12</sup>.

According to the Public Prosecutor's closing speech and, later, the text of the sentence passed in 2012, the seven representatives of the technical-scientific world<sup>13</sup> summoned to L'Aquila on March 31, 2009 had the specific institutional mandate of «sharing all the information available to the scientific community regarding the seismic activity with the citizenry»<sup>14</sup>. Let us take a step back, however. Right after the April 6<sup>th</sup> quake, the press – and thus local civil society as well – began to speak of a “failure to warn”. Once the trial was underway, this same expression was repeatedly echoed at the national and international levels. Before formal court proceedings had even begun, the Istituto Nazionale di Geofisica e Vulcanologia (INGV), Italian National Institute of Geophysics and Volcanology, circulated an appeal addressed to the President of Italy, encouraging him to oppose the trial. Although at that point it was not yet clear what the charges would be, over 5,000 scientists from all over the world signed the appeal. However, what was on trial in L'Aquila was actually “negligence”, not “science”. As clearly demonstrated by the written deposition of Public Prosecutor Fabio Picuti (2010), trial debates revolved around «unsuitable risk evaluation» and «unsuitable information» rather than a failure to warn. The scientists were not responsible for having failed to predict the earthquake, they were

accused for having predicted superficially, in a «misleading, unfounded and fatal» way, that the earthquake would not occur (*ibidem*). It was only afterwards, once they had understood the real charges brought against the CMR members, that the major international scientific journals began to evince a change of opinion<sup>15</sup>.

In short, in the judgement of the Court of First Instance the CMR members were convicted for two reasons unrelated to their ability to determine the time, magnitude and location of the earthquake and warn residents about it. They 1) performed a «vague, generic and ineffective assessment» of the risks associated with the ongoing seismic activity in the L'Aquila area, and 2) provided the relevant institutions and local citizenry with «incomplete, imprecise and contradictory information about the nature, causes, dangerousness and future implications of the ongoing seismic activity» (Billi 2012). «The Commission's responsibility did not lie in having failed to predict the seismic event [...], but rather in not making proper use of the precautionary rules<sup>16</sup>» (Santise, Zunica 2016: 206). These rules should be invoked «when a phenomenon, a product or a process can have potentially dangerous effects, even though the scientific evaluation carried out does not allow us to determine the level of risk with sufficient certainty» (*ibidem*)<sup>17</sup>.

In assessing the causative link between the defendants' communicative approach and the injurious events in question, the prosecution emphasized in particular the contradictory nature of experts' statements. The CMR members simultaneously stated that “it is impossible to predict earthquakes” and that “no earthquake is predicted to occur” or, in other words, that a seismic event greater than those already recorded in the same period was unlikely<sup>18</sup>. In so doing, they failed in their official responsibility to assess risk and their institutional obligation to provide adequate information, which resulted in the deaths of 29 people. This, in brief, is how the first ruling was formulated (Billi 2012). The issue thus touched on both the commission's scientific mandate (to assess risk in terms of probability) and their duty to inform. In the second ruling, issued November 10, 2014 and subsequently confirmed in the Court of Appeal on November 20, 2015, the charges were not annulled but legal responsibility was limited to Bernardo De Bernardinis, then-deputy head of the Civil Protection Department, and the ruling confirmed his guilt in relation to some of the victims. The six scientists were instead exonerated. Indeed, their acquittal and the rejection of collective responsibility on the part of the institutional body that met in L'Aquila, namely the CMR, distinguished

this second phase of the trial.

The CMR had initially been censured also for having given in to the political desire of Guido Bertolaso, as head of the Italian Civil Protection Department, to wage a «media campaign», taking on a role of direct communication that was not part of its institutional mandate. Indeed, according to institutional procedure, the results of the meeting should have been communicated to the relevant agencies within Civil Protection, not directly to the citizenry<sup>19</sup>. It was precisely this point that was crucial in determining the second ruling. The fact that individuals from outside the CMR had access to the meeting, the lack of a quorum and the fact that some of its members participated in the subsequent press conference were taken as indicators that the meeting convened in L'Aquila before the earthquake had not been a formal meeting of the national body responsible for preventing and predicting earthquakes, thus voiding the charge of collective institutional responsibility. However, the trial proceedings did reiterate the idea that De Bernardinis' statements played a key role in augmenting the reassuring efficacy of the messages circulated in L'Aquila<sup>20</sup>.

The second sentence thus undermined the persuasive evidence provided by Antonello Ciccozzi's report. His anthropological testimony argued that, by «ritually» summoning the scientists to the site, the intersection of science, authority and persuasion had distorted locals' existing knowledge derived from common sense in the city of L'Aquila. Local people would normally go out into the street immediately upon feeling a quake and stay away from their homes. On the contrary, according to Ciccozzi, the meeting produced an atmosphere of «scientific sacredness» that impelled people to trust unconditionally in «the word of the scientists»; the more credit people put in scientific knowledge, the more they trusted. Indeed, the segment of the population with the most confidence in the commission's analysis were those more likely to believe in the figure of the scientist «due to education, inclination or socio-cultural position» (Ciccozzi 2013: 90). The interpretive filter the CMR had inserted into local common sense took hold most powerfully among the city's better educated families. While the Court of Appeal did exonerate the six scientists accused<sup>21</sup>, it also sustained the causal link between De Bernardinis' negligent conduct before the meeting and the deaths of several victims. Although the theory of social representations underlying the anthropological expert testimony was ultimately put aside, the trial resorted to «empirical generalizations» (*massime di esperienza* in Italian) i.e., the notions of common

sense that allow the judge to lower the bar of the evidentiary framework within a given historical and cultural context<sup>22</sup>. In this case, the judge drew on the experiential notion that a message is more credible when it comes from a source that is particularly qualified (see also Ciccozzi *infra*).

The limited judicial weight granted to the theory of social representations in the Court of Appeal was justified on the grounds that this theory does not hold up strongly to scientific validation: according to this view, the theory does not display a consistent regularity capable of demonstrating the sequence of events or a significant statistical coefficient. This reasoning could be extended well beyond the social sciences, however. As recently as 2009, after a lengthy investigation in which one of the world's most important scientific bodies, the US National Academy of Sciences (NAS), appraised the reliability of forensic sciences in the United States, a report<sup>23</sup> was released showing that the controllability, falsifiability and verifiability criteria of these sciences (especially the most widely recognized forms, medical and physical-engineering forensics) have been subjected to scrutiny because they do not display the degree of scientific validity required to be granted authority in the courtroom. With the exception of DNA analysis, the report states, «no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty» establish the link between evidence and suspect that would confirm its legal validity (Holden 2011: XXIV). The report clearly illustrates how, today, «the law's greatest dilemma in its heavy reliance on forensic evidence [...] concerns the question of whether – and to what extent – there is science in any given «forensic science» discipline» (*ibidem*). With this in mind, anthropology like other socio-humanistic branches should not – as occurred during the L'Aquila trials – be held to different conditions of credibility than those employed for the sciences that have traditionally been granted more legitimacy in legal proceedings when it seeks to assert hermeneutic-cultural methods based on inquiry and long-term engagement with local contexts<sup>24</sup>.

#### *Status degradation ceremonies*

The case examined here reveals the various controversial aspects surrounding the use of scientific expertise in the event of public safety issues such as natural disasters. The slipperiness of scientific expertise can be seen on two levels: in institutional terms, in reference to the bond that links scientists to the mandates of the national

Civil Protection Department, and in legal terms, surrounding the use of expert knowledge in the courtroom. The trial also provides an interesting laboratory for reflecting on the links between science and politics when serious risks threaten the community.

As in other legal proceedings with considerable media impact, the L'Aquila trial turned into a complex representation, a kind of "public drama"<sup>25</sup> in which the representatives of science (both those in the dock and those called to provide expert testimony for the defence or prosecution) risked ending up unmasked, like characters in a play. In other words, the events gave rise to a mediatic-legal operation in which the trial was only one part and the courtroom only one of many stages. In fact, the fluidity of the boundaries between legal and moral resulted in a continuous slippage between discourse delivered in the courtroom and mediatically amplified in the public sphere. The charges that the CMR had bowed to political powers in supporting Guido Bertolaso produced a rupture in «civil society's awareness of the social uses of science, the role and function of experts and the collateral effects of scientific communication» (Ciccozzi 2013: 163). A rupture that needed to be mended, lest scientists lose their legitimacy. To borrow a phrase from the French sociologist De Certeau (1984), when science pays more attention to the demands of power than the needs of the population we gain a clear indication of the degree to which science can be subservient to politics. What was at stake in L'Aquila was not only the responsibility of individual scientists before the law, but also their collective responsibility in relation to the public, which touched on a moral judgment more than a juridical one<sup>26</sup>.

The outcome of the second phase of the trial, with six scientists acquitted and only De Bernardinis found guilty, is a clear example of this. In the transition from the first to the second trial phase, in fact, it is apparent that the «boundary-work» required at every turn to define science by what is not science (Gieryn 1983; 1999) was carried out to underscore the boundaries between science and politics. The move to frame the six defendants as individual representatives of the scientific world, thereby legally detaching them from their collective role as official members of a political-institutional body like the CMR, was an act aimed at stressing (and removing the ambiguity surrounding) the dividing line between science and politics, exonerating one at the expense of the other<sup>27</sup>. While the initial ruling had revealed the spaces of hybridity characterizing the science-politics pairing, especially when the former lends itself to exploitation by the latter,

the final verdict – subsequently reaffirmed by the Supreme Court – based its judicial evaluation on a clear demarcation of these boundaries. As a matter of fact, a considerable component of the forensic procedures in the Court of Appeal was based on a distinction between the mandate of prevention and that of forecasting, assigning responsibility for the former exclusively to the Italian Civil Protection and the latter to individual scientists. By denying that the defendants had been charged in the role of representatives of an institutional body clearly responsible for prevention (and thus communication) as well as risk prediction, the court effectively denied the "dual tie" (both scientific and political) associated with their positions as expert consultants.

In so doing, the court avoided activating that mechanism Pier Paolo Giglioli describes so well in his analysis of the *Mani Pulite* trial<sup>28</sup>, that is, the «ritual of degradation» that «consists in a redefinition of the social identity of an individual as one of a lower rank» (Giglioli 2001: 301). Just like the politicians in *Mani Pulite* proceedings, by appearing in court the scientists involved in the L'Aquila trial not only risked being found guilty according to judge Billi's ruling at first instance, they also likely risked being degraded in their status as lofty exponents of science. In the end only De Bernardinis suffered this degradation; as Guido Bertolaso's second-in-command, he remained the only direct representative of the political-institutional world.

If we want to shed light on this case, another useful notion is the concept of «status degradation ceremony» first introduced by Harold Garfinkel in 1956. The term refers to communicative work directed at «transforming an individual's total identity into an identity lower in the relevant group's scheme of social types» (Garfinkel 1956: 420). Garfinkel argued that the structural conditions of moral indignation and shame – and hence the conditions of status degradation – are «universal to all societies» (*ibidem*). Degradation tactics used in courts of law are only one example of this. In a courtroom, factors like «the movements of persons at the scene of the denunciation, the numbers of persons involved as accused, degraders, and witnesses, status claims of the contenders, prestige and power allocations among participants» (*ibidem*: 424) all influence the ceremony's outcome. From this perspective, the Court of Appeal ruling in the L'Aquila trial shows that some of the conditions that Garfinkel argues must be present for a successful degradation ceremony to take place were actually missing. Specifically, there was no successful treatment of the perpetrators as a "uniform" group

throughout the work of the denunciation; instead, their “unique” and “individual” identities were brought back on stage. Furthermore, in the second ruling the denounced scientists, no longer detached from their community due to their allegedly irresponsible behavior, were ritually put back in their position in the legitimate order of science.

*Conclusions: pursuing integrated research in disaster studies*

There is another important element that emerges from this legal case. In the courtroom, the juxtaposition of geophysical and socio-anthropological expertise revealed a divergence in how these two disciplines define disaster and what they view as the best way to mitigate its effects. The judge Marco Billi reprimanded the CMR members for having maintained an exclusively physics-oriented view of the earthquake (and, as a result, stating that it could not be predicted). In fact, the first ruling found that the scientists had failed in their institutional responsibility: to effectively assess the degree of risk rather than determine the exact occurrence of an earthquake per se, and to communicate to the relevant authorities about elements of vulnerability and exposure in the local context (Billi 2012). These elements should have included not only physical-material factors but also local perceptions of risk and the way the city residents might have reacted to the earthquake (*ibidem*). When the meeting was called, however, the commission was made up of primarily geophysicists and Civil Protection technicians, a mono-sectorial composition that did not end up representing an advantage.

Social sciences have helped redefine both the idea of catastrophe and the tools considered most effective in preventing it, going beyond purely physical and engineering aspects to also highlight historical-political and anthropological aspects<sup>29</sup>. And yet these disciplines have not achieved comparable status – in terms of scientific importance, social usefulness and public legitimacy – with more recognized fields such as geosciences. It is about time for institutions to close this gap. To do so, it is not enough to make the academic world that specializes in disasters more heterogeneous in terms of different disciplines and approaches. Rather, intervention policies and practices must become truly open to engagement and dialogue by “critically” approaching the topic of catastrophe.

Competition and tensions among different conceptions of disaster and approaches to preventing and mitigating its effects have faded in

recent decades, but these tensions still exist at the international level (Revet 2015). The problematic convergence of scientific approaches that could be seen in the course of the L’Aquila trial shows that these tensions, though often dormant, can resurface unexpectedly; too late, unfortunately, to save human lives. Here, the anthropological gaze on catastrophe might be useful. However, its importance goes beyond the domain conventionally set aside for it, namely valorizing so-called local knowledge or, in other words, the practices spontaneously enacted by the population to mitigate the negative effects of catastrophe. Rather, anthropology can also foster a critical reading of disaster, generating for instance reflections on the social construction of risk and vulnerability. The disaster that struck L’Aquila on April 6, 2009, was not the sole cause of a powerful seismic event, and neither was all the resulting damage produced by architectural structural deficiencies alone. Responsibility for the L’Aquila tragedy lies not only with the shaking of the earth but also with politics and scientists subservient to political interests, as well as an ineffective national culture of emergency information. Without this critical shift in focus, no global data collection project, no quantitative information exchange platform, no map of seismic activity and not even the most accurate probabilistic calculations of costs in terms of assets and human lives will be enough to save the population and fulfill scientists’ social responsibilities. The L’Aquila catastrophe clearly shows that the interpretive lens of the social sciences continues to play a vital role in this sector, both in analyzing and assessing risk and in avoiding ineffective information (Carnelli, Ventura 2015).

Comparison with the Lima prediction helps explain how the L’Aquila advisory meeting could have given rise to a tricky situation that contributed to producing death and destruction rather than protecting goods and people. There is another factor that has fundamentally changed in the thirty years since the Brady-Spence prediction: besides changing relations between political power and scientific knowledge about disaster, there has been a shift in the way that citizens and civil society relate to these forms of power and knowledge. Information about the risk associated with natural calamities unquestionably has social repercussions; at the same time, the citizenry now has a more proactive and even oppositional role in relation to these repercussions. Compared with Brady and Spence’s times, now information about risk circulates through the population more rapidly and, often, in an unfiltered form. However, given the dominant position science has achieved today, further amplified by new and old media and their associated possibilities for

information dissemination, there is another factor that cannot be overlooked: it has also become easier for the population to appropriate, reformulate and directly contest scientific knowledge, especially when it takes the form of expert consultancy. In L'Aquila, organized civil society and victim's associations were able to bring charges against the CMR. Antonello Ciccozzi was called in as an expert consultant, but he was no outsider – above all, he was a member of the L'Aquilan citizenry struck by the earthquake. In fact, he had survived the quake together with his family.

Today, the social movements created by natural disaster survivors or potential victims have their own forms of knowledge. Even if not equally authoritative, these are still strong enough to call into question public decisions and the science behind them, just as occurred in L'Aquila. Indeed, the gap between scientists and citizens is closing. It is true that scientists «advise governments about every sector of activity, playing a fundamental role in the modern state» (Hilgartner 2000: 3); furthermore, expert opinions about serious risks are «a singular source of authority in Western society» (*ibidem*: 4). And yet this authority does not enjoy unquestioned respect. Rather, it is likely that there will be more and more examples of open contestation surrounding expert technical decisions and the ways they are communicated to the general public. The broad public impact of the L'Aquila court case clearly shows that the authoritativeness of expert knowledge, that “sacred aura” Ciccozzi discusses in his book, is something that experts are now required to «actively maintain, cultivate and safeguard» (*ibidem*: 5) rather than taking for granted. After all, other scholars have shown that «the case against the “L'Aquila Seven” should be read within a broader paradigmatic shift in our understanding of the role of public officials and scientists in disaster management» (Alemanno, Lauta 2014: 1; see also Lauta 2014). Indeed, the L'Aquila court case reveals the problematic risks of disregarding the «accumulated lay expertise on how to respond to earthquakes», making the local population «entirely dependent on scientific advice» (Alemanno, Lauta 2014: 6).

It is imperative for the scientific world of natural catastrophes to critically rethink how forms of knowledge about risks and calamities are produced, circulated and granted political-institutional legitimacy. This holds true not only for the group of scholars with the strongest and most central place in disaster studies. Indeed, it is time for the entire scientific sector to urgently and critically reconsider how their expertise can effectively serve society without producing tragedies like L'Aquila. To do so, we must assume ethical responsibility not

only individually but also collectively – otherwise, the sector risks serious internal fragmentation. A policy of ambiguity in risk communication might serve certain political interests and, as the L'Aquila case suggests, it might even be compatible with the agendas of emergency response agencies. Those working in disaster studies cannot be complicit in such a policy, however. If expert opinions on catastrophes are inevitably caught up with politics, «the credibility of science advice will often be problematic» (Hilgartner 2000: 5) even when they are not specifically negligent in fulfilling their mandate. And yet a professional sectarian response is not enough to defend the legitimacy of expert advice and the scientific recommendations that follow from it. Efforts to maintain the cultural authority of disaster sciences must be pursued with a keen critical sense, not simply defended.

We must ensure that “front stage” areas, the platform through which scientific advice on disasters is conveyed, do not prevail over ordinary decision-making arenas. If this were to happen, politicians as well as administrators and disaster technicians would run the risk of not only making bad decisions but failing to make decisions at all. As is well known, political and technical decisions about disasters and how to prevent and mitigate them are usually made in the backstage rather than front stages. More than the front stage, thus, it is backstage culture that must be properly maintained. And this requires fine-tuning scientific knowledge while at the same time encouraging a healthy and shared approach of social responsibility among scientists. Otherwise, it should come as no surprise if these spheres of responsibility become slippery and ambiguous, or if public communication becomes hazy and our role discredited.

In the current crisis of expert knowledge, eroded by the media, politics and grassroots social movements as well as the justice system itself, we must scrutinize the rhetoric used to make sense of a paradigmatic event like a disaster whether or not this rhetoric will ever be put on trial in a court of law. In an effort to create a reliable basis for their judgments, experts draw on stylized formulations with a precise narrative form. Anthropology is no exception. As highlighted by Federico Brandmayr, «expert witnesses tend to share assignments of responsibility and value judgments about the case with those who summoned them, and, consequently, belonging to a discipline (such as anthropology) or to the field of science in general is less important than the role the expert has in a trial» (Brandmayr 2016: 26). It is therefore imperative that those providing this type of consultation assume the stance of “critical ethnocentrism” so dear to many

anthropologists<sup>30</sup>. This stance involves continually interrogating one's own analytical categories, not to reject them but to expose their historically determined character, revealing the limits that should apply when providing consultation.

## Notes

<sup>1</sup> In distinguishing between deterministic and probabilistic methods, I do not refer to the statute of technical-scientific consultation required by the courts. Indeed, these valuations are always provided on a probabilistic basis; they do not produce exact and binding "predictions" regarding the *hic et nunc* of a given event. Furthermore, the consultation provided in the courtroom mainly involves *ex post* reconstruction rather than *ex ante* evaluations. Scientific assessments are a different matter. In seismological sciences, forecasting can be deterministic or probabilistic or even located on an intermediate point along this continuum. Although seismology has gradually lost much of its confidence in deterministic forecasting techniques since the days of Brady and Spence, researchers continue to work on strengthening the scientific premises of deterministic earthquake prediction. See, among others: Sgrigna, Conti 2012. The Geological Society of London's website provides a clear explanation of the difference between deterministic and probabilistic earthquake prediction, stating that: «geoscientists are able to identify particular areas of risk and, if there is sufficient information, to make probabilistic forecasts about the likelihood of earthquakes happening in a specified area over a specified period [...]; [however] it is not currently possible to make deterministic predictions of when and where earthquakes will happen. For this to be possible, it would be necessary to identify a "diagnostic precursor" – a characteristic pattern of seismic activity or some other physical, chemical or biological change, which would indicate a high probability of an earthquake happening in a small window of space and time. So far, the search for diagnostic precursors has been unsuccessful» (<http://www.geol Soc.org.uk/earthquake-briefing>).

<sup>2</sup> Giampaolo Giuliani worked as a non-degree-holding technician for the Institute of Interplanetary Space Physics at the National Laboratories of Gran Sasso branch and is now retired. In the pursuit of his own individual scientific interests, he has continued his studies into the correlation between the release of radon gas from the earth's crust and the occurrence of earthquakes, and set up a network of equipment positioned in various locations around the L'Aquila area. His predictions are based on the analysis of radon

emissions, which (together with other seismic precursors such as tectonic lifting and premonitory shocks) can be experimentally used in seismology to evaluate the possible occurrence of an earthquake.

<sup>3</sup> Length limitations prevent me from discussing the controversy surrounding the case of Giampaolo Giuliani in the detail it deserves. It is important to note, however, how the reaction to his forecasts by both the scientific and political-institutional communities was remarkably rapid, uniform and single-minded, with Guido Bertolaso first pressing charges against him for sounding a false alarm and scientists then launching a campaign to discredit him.

<sup>4</sup> This was the fact-finding meeting convened by the Civil Protection Department to monitor the degree of earthquake risk in L'Aquila and held March 31, 2009, which was subsequently the object of judicial investigations. As I will explain in more detail below, the meeting – which took place five days before the April 6 earthquake – resulted in a first degree indictment for Bernardo De Bernardinis, Giulio Selvaggi, Franco Barberi, Enzo Boschi, Mauro Dolce, Claudio Eva and Michele Calvi, who were initially sentenced to six years in prison for having provided reassuring information before and after the meeting (see note n. 11).

<sup>5</sup> This phrase is taken verbatim from a recorded telephone conversation between Guido Bertolaso and the then-Regional Minister in charge of the Civil Protection Department in Abruzzo, Daniela Stati, as published by Repubblica.it (phone call from March 30, 2009: <http://video.repubblica.it/le-inchieste/bertolaso-e-il-terremoto--sia-un-operazione-mediatica/85961/84350>). During this telephone exchange, Bertolaso sought to bring Stati's attention to the inappropriateness of the institutional communications that had been circulating in the press, specifically the statement that "there will not be any tremors". «That is something you do not ever say, Daniela, not even under torture», the head of Italian Civil Protection Department commented via telephone. Bertolaso was later investigated for multiple counts of negligent homicide and negligent disaster in relation to the L'Aquila earthquake. This second trial, referred to as "Major Risks, the encore", recently concluded with the acquittal of Bertolaso for having not committed the crime. This ruling came just a few days before the period of limitations, which was set to fall on October 6, 2016, seven and a half years after the earthquake. Prosecutors had asked that the defendant be sentenced to three years in prison.

<sup>6</sup> The contradictory nature of the information provided by members of the CMR is highlighted in the text of the ruling at first instance. The motivations behind the guilty verdict, issued October 22, 2012 by Judge Billi (2012:

2-3), state that: «By saying that “it is extremely difficult to make temporal predictions about the evolution of seismic phenomena”, “the fact that many small earthquakes have been observed does not constitute a precursory phenomenon” and, at the same time, [making] the opposite statement that “any forecast would lack a scientific basis”; “in Abruzzo, serious earthquakes have extremely lengthy return periods. It is unlikely that a strong seismic event such as the one in 1703 will occur in the near future, although this risk cannot be definitively excluded”», members of the Commission generated confusion in the victims, causing them to remain inside their homes, «contrary to established habits of caution, until the fatal outcome occurred» (*ibidem*).

<sup>7</sup> As Federico Brandmayr notes in a recent article that analyses the role of social scientists in Court (2016: 8), «The peculiarity of the L’Aquila trial is how the causal relation between the phenomena under examination was placed within the realm of social sciences. Indeed, the opposing sides summoned specialists in criminology, anthropology, sociology, social psychology, and neurosciences».

<sup>8</sup> For more details on Mario Morcellini’s expert advice during the L’Aquila trial see Brandmayr 2016. The same author also analyses the expert reports requested by the defense to other three scholars: Stefano Cappa (professor of neuropsychology), Enrico Smeraldi (psychiatrist), and Luciano Arcuri (social psychologist).

<sup>9</sup> See note n. 4.

<sup>10</sup> Italian government 1992: [http://www.protezionecivile.gov.it/jcms/it/view\\_prov.wp?contentId=LEG1602](http://www.protezionecivile.gov.it/jcms/it/view_prov.wp?contentId=LEG1602).

<sup>11</sup> D.P.C.M. 3-4-2006 n. 1250, *Composizione e modalità di funzionamento della Commissione nazionale per la previsione e la prevenzione dei grandi rischi* (Repertorio n. 1250). Published in the Official Gazette of the Italian Republic October 9, 2006, no. 235.

<sup>12</sup> See the previous note.

<sup>13</sup> The individuals involved were Franco Barberi (at the time, acting Chairman of the CMR), Bernardo De Bernardinis (at the time, deputy chief of the technical sector of the Civil Protection Department, headed by Guido Bertolaso), Enzo Boschi (at the time, President of INGV), Giulio Selvaggi (Director of the National Earthquake Center), Gian Michele Calvi (Director of Eucentre), Claudio Eva (Full professor of physics at the University of Genoa), and Mauro Dolce (Director of the Seismic Risk Office of Civil Protection).

<sup>14</sup> As stated in the press release issued by the Italian Civil Protection Department the evening of March 30, 2009.

<sup>15</sup> This clear shift in the way national and international media and leading scientific journals treated the issue has been documented by several authors. A prime example is the position taken by the journal *Science*, which initially circulated news about a crazed Public Ministry putting scientists on trial because they did not listen to the predictions of the “sorcerer” Giampaolo Giuliani (see the article by John Travis and Laura Margottini, published April 7, 2009). Even *Nature* got off on the wrong foot, expressing the indignation of the global scientific community (in an article by Nicholas Nosengo from June 22, 2010). About a month later, however, it the first comments by Fabio Picuti were made public, in which the prosecutor spoke broadly of risk assessment and how the scientists’ assurances had encouraged people to change their usual behavior with fatal consequences. It was at this point that the major newspapers and magazines began to revise their statements, correcting their previous distortions of the charges. See the articles published in *Nature* (Hall 2011) and *Science* (Cartlidge 2012; Miroslav and Juanchich 2012).

<sup>16</sup> Italics added by the author.

<sup>17</sup> Space limitations prevent me from developing in more detail the legal controversy that has arisen alongside the L’Aquila trial, a debate that has involved a number of experts in criminal law. To name just one of many possible sources, see: Notaro 2016. In this context, one of the key questions is whether or not it was legal for the Court of Appeal judge to employ the notion of empirical generalizations to prove the causal link.

<sup>18</sup> See note n. 6.

<sup>19</sup> Both Ciccozzi’s report and the first court ruling claim that the elimination of this filter, Civil Protection’s role in mediating between the CMR and local residents, served to make the message more reassuring. Basically, the procedures, modes and content of the information communicated to the public were not sufficiently measured and fine-tuned.

<sup>20</sup> Voices both inside and outside of the courtroom have echoed this accusation that Bernardo De Bernardinis lent his support to a purely media operation conceived of by Guido Bertolaso, staging his opinion in a nearly farcical way. One thinks, for instance, of the image of De Bernardinis in front of the camera shortly before the L’Aquila meeting who sought to reassure the population by suggesting they uncork a bottle of Montepulciano wine. However, while it has been established that De Barnardinis behaved irresponsibly, Bertolaso was acquitted for lack of evidence. During the trial, the wire-tapped phone conversations between Bertolaso and the regional head of Civil Protection (“instead of you and I talking, let’s get the top seismology scientists to talk

about it” in order to “calm the people down”) were, in fact, not given a legal weight.

<sup>21</sup> The full text of the Court of Appeal ruling is available at the following url:  
<http://www.giurisprudenzapenale.com/wp-content/uploads/2016/04/terremoto-sentenza.pdf>.

<sup>22</sup> The concept of empirical generalizations also played a decisive role in determining causation in the case of an earthquake in relation to another Italian legal case, namely the Campobasso Appeal Court ruling in which various subjects (two builders, the architect, the municipal technical expert and the mayor) were found guilty of multiple counts of negligent homicide for having helped to create conditions leading to the collapse of the Francesco Jovine elementary school in *San Giuliano di Puglia*, where many students and teachers were killed during the October 31, 2002 earthquake in the Molise region (Santise, Zunica 2016: 205).

<sup>23</sup> This report, *Strengthening Forensic Science in the United States*, is available at the following url: <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>.

<sup>24</sup> Also see Ciccozzi’s article in this special issue.

<sup>25</sup> Stephen Hilgartner (2000), studying the socio-political aspects of science in cases of controversy about risk, draws on the work of classic authors such as Victor Turner (1974; 1980), Erving Goffmann (1959; 1963), Bruno Latour (1987; 1988) and *Science and Technology Studies* more generally (Latour and Bastide 1986; Latour and Woolgar 1979; Lowe and Williams 1982) in approaching expert consultation as an example of public drama. Employing the metaphor of performance, the author explains how widely and frequently governments currently call upon techno-scientific knowledge to justify a wide range of public decisions, creating a sort of “hybrid” between science and politics

<sup>26</sup> The ambiguous interplay of the legal and the moral during the L’Aquila trial was undoubtedly exacerbated by the tendency to attribute a “moral” character to disasters. The role neglect, error and human responsibility play in causing catastrophe often triggers moral debates which, thanks to the press and above all new social media, can have a powerful impact on public opinion (Dei 2015). The events following the Sarno landslide in 1998 are a good example of this. As the historian Hayden White has shown, even at the time the debate was dominated by tones of anger, resentment, accusation and recrimination, granting it a precise moral significance and opening the way to classifying the various representations of the event and people involved in terms of liability and negligence, nobility and baseness, guilt and innocence (White 2000).

<sup>27</sup> It is not surprisingly that this work of boundary demarcation is required to manage a situation that threatens public safety. In these cases, to maintain the recognisability of science’s social role it is necessary to determine without a doubt who is most responsible, scientists or politicians.

<sup>28</sup> *Mani pulite* (“clean hands”) was a nationwide judicial investigation into political corruption held in Italy in the 1990s that led to the collapse of the so-called First Republic. In the investigation, some of the most important political leaders of the time confessed to «having illicitly accepted massive sums of money from publicly and privately owned companies to fund their parties» (Giglioli 2001; Giglioli, Cavicchioli, Fele 1997).

<sup>29</sup> The anthropology of disasters, and the critical social scientific approach to disasters more generally, began to spread internationally in the early 1980s (O’Keefe, Westgate, Wisner 1976; Hewitt 1983, 1995; Oliver-Smith, Hoffman 1999; Hoffman, Oliver-Smith 2002). For a recent overview of these studies, see: Benadusi 2015; Faas and Barrios 2015; Faas 2016.

<sup>30</sup> For more details on the method of “critical ethnocentrism” introduced by the Italian anthropologist, folklorist and historian of religion Ernesto de Martino, see: Saunders 1993.

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