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The May 1998 Landslides in the Sarno Area in Southern Italy: Rethinking Disaster Theory

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THE EVENT

After two continuous days of rain, at about 4:30 p.m. on Tuesday, May 5, 1998, the southern and southeastern sides of Mount Sarno and Pizzo Alvano (elevation 1,133 meters), astride the

province of Avellino and Salerno in the Campania region of Southern Italy, began to disintegrate under the pressure of the accumulated water. By midnight the initial rivulets of dirty water had grown into a 20-foot wave of mud that roared down the slopes of the mountain and buried under its force a considerable portion of five towns with a total population of approximately 71,000.

The darkness of night did not allow people to understand what was happening: hundreds were buried in the mud. Some escaped to the upper floors of their homes, only to be buried under the debris of their buildings when they too collapsed. Hundreds of automobiles were washed away like toys.

During the first week after the disaster the number of people believed to have died or unaccounted for was 245, but by the third week the number was reduced to 137 dead and 18 people unaccounted for. The damage from the disaster was initially estimated in the neighborhood of 500 billion lire (approximately $300 million), but, as frequently happens with natural disasters in Italy, by the end of 1999 the estimated loss had escalated to nearly 1,000 billion lire (over $500 million). More than 50 billion lire will be needed to rebuild or repair public buildings alone (hospitals, schools, churches).

The rain stopped temporarily by the weekend of May 9-10, as this research was getting underway, but on Thursday, May 14, a general evacuation plan was put into effect in part of the area, in anticipation of more rain during that weekend. In addition to thirty major landslides, Wascam-equipped helicopters identified twenty-three additional sites where masses of mud, stone, and soil were hanging perilously above the underlying rock, threatening to slide down if additional rain occurred.

The efforts to dig out corpses and to open access paths through the mud-covered streets was frantically underway in several places within Sarno and Quindici, wherever there was reason to suspect that the bodies of missing persons could be found.

By Tuesday, May 12, all top members of the Italian government, the president, the prime minister, the presidents of the senate and of the house, and various heads of the Italian political parties had made rapid, and uncomfortable, visits to the disaster area, had apologized for the slow arrival of relief units and for the lack of coordination of the relief forces, and had promised to appropriate an emergency fund of 50 billion lire, (approximatley $30 million) for the emergency needs.

In the local and national Italian newspapers and in TV programs politicians and social activists were vying with each other to place the blame for the failure to prepare for the expected disaster and for the slowness of the relief program.

AT THE ROOTS OF THE DISASTER . . .

In the Sarno case, the sudden deterioration of the fragile territory on the occasion of the heavy rain of May 4-5, 1998, can be attributed in large part to decades of neglect of disaster prevention

actions. This unrelenting "program" of degradation is exemplified by the deforestation of the mountain slopes, the neglect and/or the elimination of the traditional flood and landslide control systems, the numerous human-caused forest fires, the uncontrolled grazing of the mountain slopes, and extensive illegal building. All these activities have gone on for decades and on a large scale by shortsighted citizens and have been condoned by the administrations, in tacit collaboration with the same organized crime groups that after the mudslide vied to secure the government contracts for the reconstruction.

On at least five occasions, corresponding to as many occasions of relatively heavy rain, during the ten months from May 5 to February 1999 the population of the area was either temporarily evacuated or alerted to the imminent possibility to evacuate their homes for fear of repeated flooding.

It can be anticipated that this condition will prevail for several years to come.

THE THEORY

The Sarno landslides, therefore, presented a unique opportunity to rethink and analytically reformulate conventional disaster theory by identifying *two crucial elements* that emerge from the Sarno case and that help define and explain a disaster and its consequences in a more satisfactory way than conventional theory.

We can subsume these two elements under the general notion of a *negative culture of disaster*.

The first element of the negative culture of disaster is the condition of systemic *disaster proneness* (a notion different from the disaster event itself) viewed as a crucial, distinct, and irreducible component of the sociocultural system of a given territory subject to disasters.

The second element of the negative culture of disaster has to do with the synchronic notion of disaster itself, which is commonly viewed as a one-shot event, well defined in time. The Sarno event forces us to visualize an alternative scenario of disaster, diachronic in format, as a slowly emerging, growing and persisting physical, as well as sociocultural, condition of a given territory, that occasionally breaks through to the level of "conventional" disastrous moment, when triggered by particular natural conditions.

The theory argues that between the two elements above there is a strict correlation: a disaster-prone sociocultural system produces an ongoing and enduring disaster. Such disaster is not experienced, suffered, and recovered from within a limited amount of time, but is embedded into the culture of the area, to the extent of becoming a significant part of it, leading to eventual physically overt disastrous consequences for the area involved.

Therefore we can rightly designate such combination of elements as a *disaster-prone sociophysical system*, sustained by a negative culture of disaster, or, territorially speaking, we can designate the system as a *natural disaster area*.

There have been numerous studies aimed at defining the physical vulnerability of a given area and its propensity to "natural" disasters. But the very definition of disasters as "natural" has distracted the scholars' attention to the pre-existing sociocultural conditions of a territory, which can significantly increase the probability of a disaster happening as an event. Moreover, although more recent disaster theorists have increasingly appreciated the significance of the disaster as a "socially defined and engendered" event, limited attention has been paid, and even more limited analysis conducted, to identify the sociocultural factors that may increase or diminish the possibility of a disaster's happening (mudslides, flooding, fires, etc.), or even the magnitude of its impact (earthquakes, tsunamis, etc.).

If we reduce the theory to its core, it could be stated that all disasters are "human-caused", although at times they are precipitated and aggravated by the forces of nature. To the extent that they cause preventable damage, disasters are traceable to the culture of preparedness, understood as a society's ability to anticipate disasters' happening and society's being endowed with societal features suitable to manage disasters and recover from them in reasonable time.

The Sarno events of May 1988 are a strong validation of this theoretical approach.

THE RESEARCH DESIGN

After initial field work during the first two weeks of the disaster (under the terms of the quick response grant), research was conducted in three additional research periods, during which the disaster site was visited and studied for an additional thirteen days.

Three major objectives were pursued:

1. Monitoring and documenting the more significant events of the weeks and months following the disaster. In view of the ongoing nature of the disaster, monitoring was extended well beyond the duration of the grant, to the summer of the year 2000.
2. Verifying the existence, operativeness, and modality of the hypothesized negative culture of disasters through direct observation and through a number of interviews with local informants and with representatives of the disaster intervention units.
3. Evaluating the cultural appropriateness and effectiveness of the new rapid intervention program adopted by the Italian COM (the Italian Disaster Management Bureau), and modeled on the principles and strategies of the American Federal Emergency Management Agency (FEMA), against the background of a culture (Italian) that is significantly at variance with that for which FEMA was excogitated (American) in the first place.

THE RESEARCH PROCESS

The researcher reached the scene of the disaster on the sixth day after the event.

The initial visit to the disaster area was a quasi-official one. The researcher was asked to accompany Mrs. Matilda Cuomo who was leading a delegation of Italian-Americans to the site of the disaster. The delegation was received by the mayor of Sarno, who accompanied the visitors on a several-hours-long tour of the disaster area. In the days following the mudslides most of the area had been closed to the public and would remain so for several weeks following. But on the day of the researcher's first visit to the site, the official chaperoning by the mayor opened all the doors. The delegation heard firsthand reports from the mayor, several council members, technical personnel and some of the victims of the disaster.

The occasion served at the same time as introduction, acquaintance, and accreditation. In the days that followed, the researcher had no problems in moving freely about the area, whether by car or on foot, being easily recognized thanks to the introductory visit.

Methodologically, the research developed along three main lines:

1. Direct visual observation and photographic documentation of the mudslides;
2. Interviews with qualified informants and respondents from the various towns affected;
3. Gathering of official documentation, reviews, and press reports on the event.

DIRECT OBSERVATION

The principal investigator managed to secure the help of a young sociology professor from the nearby University of Benevento, who had been a research associate in the researcher's previous study of the 1980 earthquake in southern Italy. Every day they set about together from the city of Naples, where they were lodging, and reached the disaster area by rented car, spending the entire day interviewing and observing until nearly midnight. They twice drove over the entire perimeter of the disaster, which extends along a series of valleys in an elliptical form around the mountainous chain north and northeast of Sarno. The towns affected are located on the southern, the southeastern and the northeastern side of the oblong ellipsis formed by the mountains.

All along this site were long, irregular strips of wide open brown scars on the mountain sides, several hundred feet wide, where the topsoil had slid from the peaks of the mountains to the bottom flatland, alternating with strips of vegetation that still covered the higher edges of the mountains. The sequence of brown and green stripes widened or thinned depending upon the configuration of the valleys.

At the feet of the mountains the brown mud had followed a most erratic path; in some parts of the inhabited areas it had completely wiped out every trace of buildings, human-made structures, and every sign of vegetation, including centuries-old trees. The drainage canals built a century and a half ago were completely clogged, covered with mud and enormous piles of debris. The cultivated fields located at the foot of the mountains had been inundated and were covered with several feet of brown mud which, in most cases, reached the lower branches of the nut trees.

On the walls of the inhabited areas the mud had left clearly visible marks. In several spots they indicated that the mud flow had reached as high as the second floor of the buildings.

Most astonishing was the juxtaposition of areas where the buildings had been totally wiped out with areas where buildings were left mostly intact, except for the marks of dried-up mud on the walls.

Here and there one could still see frightening signs of the violence of the mud slide; huge pieces of concrete and enormous blocks of rock, at times as large as eight feet in diameter, and very large trees over forty feet tall had been uprooted from their moorings and carried hundreds of feet down the slope.

Wherever the slide hit at the peak of its acceleration, for instance when it was forced to change direction because of some obstacle, it caused unremitting and total destruction.

Although much of the mud had been removed from the main street of each town, walking through the habitat was possible only with high boots. On the three occasions when it rained during our initial visit, the streets became literally small rivers of mud.

THE EMERGENCY PHASE

The questioning of our respondents regarding the events of the five days before the researcher's arrival, as well as the first field observation, brought out four coping patterns in as many locations. Each one of these locations was a distinct focus of social activity:

1. The flooded areas where teams of fire brigade, army units, and volunteers were digging out tons of mud and still searching for survivors by day and by night with the help of powerful floodlights. In Sarno excavation continued for 18 missing people that no one could account for up to fifty days after the disaster. By then all 137 dead had been identified.
2. The three COM command posts (in the city halls of the three largest cities affected by the disaster) where the civil protection personnel and representatives of the various agencies and volunteer organizations manned telephones, computers and fax machines;
3. The shelters (schools and market areas) where the homeless were temporarily sheltered and helped by scores of volunteers; and,
4. The areas of town untouched by the disaster, where life appeared to go on as usual (even to the extent of young people promenading along the main street or unconcernedly sipping cappuccinos at the local café, a phenomenon about which several volunteers who had come from outside complained bitterly).

THE INTERVIEWS

Thirty-five interviews were conducted in the course of the initial field work; of these, 24 were with informants and 11 were with respondents who had been victims of the disaster.

The informants included the three mayors of the principal towns affected, two city planners, four heads of the town's technical offices, two parish priest, four volunteers, five components of the COM (Central Control Unit), and four professors of the University of Salerno, who were members of the technical group nominated by the government to evaluate the disaster and propose appropriate remedies.

Of the 11 respondents, four had lost one or more members of the immediate family or relatives and, in addition, had lost all their material possessions (home, clothing, furniture, documents, pictures) including the street address and the street where they lived. The homes of the other seven had been severely damaged, and, in addition, they had lost some distant relative or a friend to the disaster.

The interviews were conducted in churches, in piazzas, on the road, at town meetings, in the car - in a word, wherever feasible. Some interviews lasted over one and a half hours, others were shorter, especially when respondents became very emotional while reminiscing about their losses.

The disaster area was visited again in November 1998, a third time in February 1999, and finally in the summer of 2000.

THE DOCUMENTATION

Throughout the several months of research two basic types of documentation were collected:

1. Official documents produced by government agencies, by public interest groups (such as the WWF), and by the Interdisciplinary Disaster Research Unit of the University of Salerno; and
2. Articles from local periodical publications and newspapers with a good reputation for responsible reporting.

In the week immediately following the disaster, because the researchers were in the field most of the time, it was impossible to follow the Italian TV daily coverage of the disaster. Much up-to-date information was gathered by listening to the local radio stations while traveling by car.

However, the documentation collected makes it possible to follow the day by day development of the events, as filtered through the media.

THE FINDINGS

From the series of interviews and a systematic analysis of the documentation collected several major trends emerge with sufficient clarity:

1) Most people agreed that, though it occurred "suddenly," the disaster had been clearly predicted and expected.

A smaller landslide had occurred as recently as January 10, 1998. On that occasion the government had allocated an emergency fund of $120,000 that was never spent.

In the region of Campania there have been 631 landslides since 1954. Many mountains are barren and devoid of trees mostly because every summer thousand of fires burn beyond control, lit by local shepherds interested in fast-growth grass for their grazing animals, or by individuals interested in creating conditions for criminal or illegal activities, or by persons interested in obtaining government relief or reforestation jobs and funds.

Back in the 19th century (1830-60) the Bourbon rulers of Naples had built a complex system of water catchment basins and canals to control flooding and landslides in the area. Over the past fifty years most of these hydro-ecological structures have been paved over and used as roads or covered by houses built without permit.

In Episcopio, one of the most heavily damaged suburbs of Sarno, a school, a sport center, and a social center with a never completed swimming pool had been built over the original canal and water retention buffer area constructed by the Bourbon kings.

One could almost say that the local population had done everything possible to insure that the disaster could occur. . .

As for the immediate response to the onset of the disaster, the interviews revealed two very clear and meaningful patterns of specific disaster preparedness and response: the Sarno pattern and the Quindici pattern.

In the months preceding the disaster, both towns had received clear warnings on the occasion of smaller mudslides that had occurred in the area.

On the day of disaster onset, in Sarno no preparedness measures were taken. The mayor, for whatever reason, did not alert the regional and national authorities until it was too late; actually he repeatedly assured the people and the authorities that things were under control. The disaster caused maximum damage in Sarno and killed one hundred and twenty six people.

In contrast, in Quindici the city authorities, remembering recent threatening events, began to evacuate the town at noon. When the landslide hit the town late in the evening, physical damage was high, as over forty homes were totally destroyed, but only 11 people died - mostly elderly persons who did not want to leave their homes.

Examination of the political background of the two communities brings out what may appear at first to be a mere coincidence, but is not. Sarno has had, and still has, a solid reputation for being

mafia controlled and a nest of organized crime. Quindici had recently been governed by a female mayor who had run her campaign explicitly on the promise to rid the town of organized crime and had apparently succeeded in doing so to a great extent, before the end of her political career.

2) Much of the devastated area remains at risk, and no satisfactory mitigation provision has been taken yet or is programmed for the near future. The feeling of our respondents was that whatever will be done, if anything at all, will be too late and insufficient.

In spite of the presence of at least five teams of workers intent on removing the mud cover, two weeks after the disaster much of the inhabited area was still covered by debris and remained inaccessible.

For the first three months the authorities availed themselves of the excuse that nothing could be done until the official report of the Interdisciplinary Disaster Research Unit, composed of professors and technicians from the nearby University of Salerno and commissioned at the of cost of $2 million, was received and examined. However, when the report finally came out, the findings and the recommendations were very disappointing.

The report explained that the problem of the Sarno area is geomorphologic in nature. Over the past twenty thousand years, due to the eruptions of the nearby volcano, Mount Vesuvius, a blanket of "pyroclastic" material, composed of lapilli, volcanic dust, and similar substances, has accumulated and covered the rather steep slopes of the mountain range, adhering temporarily, but perilously, to the calcarean rock of the mountains. The rock formation itself is highly water absorbent, creating a rich source of springs and rivulets in the area. After long protracted rains, however, both the inner calcarean rocks and the outer pyroclastic blanket fill with water, which gathers particularly in the interstitial spaces between the two, creating a widespread sheet of fluid that exerts pressure on the outer pyroclastic blanket, causing it to detach from the underlying calcarean rock and precipitate to the valley below in a slide of mud that at times reaches a speed of 30 or more kilometers per hour.

The report estimated that during the May 1998 mudslide over three billion tons of such pyroclastic material slid. But the mountains are still covered with untold additional billions of tons of such material also capable of sliding under similar rainy conditions.

The report recommended building retaining dams at specific points along the slopes of the valleys and cleaning the drainage canals built by the Bourbon kings.

3) In spite of a series of recent disasters in Italy, and in spite of the adoption of American intervention strategies (borrowed from FEMA) the Italian COM has once again proven less than optimally capable of rapid emergency intervention. The first to arrive on the scene of the disaster were the volunteer groups from nearby areas, especially those that had just terminated their tour of duty helping the victims of the Umbria earthquake.

Some of them arrived at the scene of the disaster within hours, but they found their access to the towns blocked by walls of mud. A few days later, as their number reached over 4,000 (including firefighters, army troops, forest rangers, employees of the national civil protection agency, and

medical workers), their deployment and usefulness became unwieldy due to lack of information, communication, and coordination. Several of them returned to their home base waiting for instructions. But when a large contingent of U.S. marines arrived from the NATO Base in Naples and a larger one from the Aviano Air Force base, these American troops immediately began to remove the mud from the streets and buildings, providing an example of coordination and efficiency.

4) The Sarno mudslide precipitated a nationwide clamor to restructure and coordinate the three government ministries that have jurisdiction over disaster events in Italy. It exposed the basic weakness in the Italian Emergency Preparedness Program. The major problem, experienced especially during the first ten days, until the COM could be put together on May 8, was the overlapping responsibilities and jurisdiction among the several government bureaus involved and the lack of communication and coordination at the lower echelons.

Finally, as the COM became operational, it brought physically together, in the same room in the three city halls of the towns concerned, around an enormous square table littered with telephones, the representatives of *twenty government agencies*, local administrations, volunteer groups, and every other helping unit officially recognized by the COM. A representative from each group was present at all hours in the control room, so that timely decisions and rapid, uninterrupted communication could be had. But by the time this was achieved the brunt of the disaster was over.

At the same time, the disaster again set in motion a radical re-examination of the failure of the Italian government to develop a sound policy of land use and control. Over the past twenty years there have been numerous laws to answer this particularly strong need in Italy, but they have been largely ineffective or simply ignored.

The transferring of FEMA models of disaster intervention to the Italian setting raises serious problems regarding cultureal appropriateness. It is not sufficient to copy the American intervention manual and regulations, if the country where these methods are applied lacks a basic orientation toward nonoverlapping forms of governmental responsibility. In Italy the entire national administrative system operates on the principle of multiple overlapping functions, in order to accommodate claims for power by various parties and groups. There is almost no governmental program over which at least three ministries do not have some form or other of jurisdiction, thus assuring overlaps, conflicts, and inefficiency.

5) In the meantime the thousand of homeless victims were anxious to return to their mud-filled homes, or to find a more comfortable shelter than the schools and dormitories placed at their disposal by the government. The local authorities decided to sublet empty apartments and relocate the homeless people there. But several local citizens who had empty apartments in undamaged buildings refused to rent. By December 1998 the local administration was considering requisitioning the empty apartments to provide lodging to those who had lost their homes, with the government paying rents at a fixed price.

The parish priest of Episcopio was predicting that the emergency conditions would prevail till the end of summer 1999. He had put together a civic committee of 30 leaders to monitor the

situation and to apply pressure on the national and regional authorities for prompt action. Every two weeks they would hold a town meeting in the "duomo" (mother church) that had been the seat of a bishopric in past times.

On Friday, May 29, from 7 to 11:50 p.m. the researchers were able to participate at one such town hall meeting. The church was crammed with over 500 people; the authorities sat on the dais by the altar. After brief reports by the parish priest, the mayor, and the head of COM, the debate was open to the public and pandemonium followed. There was screaming, recriminations, insults, arguing back and forth until nearly midnight, when the parish priest over the loudspeaker announced that the meeting was over. People began to disperse, but the discussion, arguing, and yelling went on in smaller groups along the streets of the town.

We were informed that many such meetings have been held periodically since then, but apparently they never succeeded in properly mobilizing the local population or impressing upon the national and regional authorities the need to intervene with a comprehensive reconstruction and prevention plan.

THE POST-EMERGENCY PLAN

The researcher revisited the Sarno area one more time in the summer 2000. In spite of the government's promises and notwithstanding the allocation of government funds (however limited), the disaster area showed little change from the time of the last visit. In the media the leading news related to the disaster covered the various court cases still going on to determine the responsibilities of public authorities in the handling of the disaster, and the notable reappearance of organized crime. The mayor of Sarno had been indicted for murder in the second degree for the death of the mudslide's victims. Salerno Attorney General Sessa had already begun an inquiry into responsibilities for the disaster in May 1998.

Regularly, on rainy days the entire area was placed on state of alert, in anticipation of renewed mudslides. Several people we interviewed manifested a deep-seated anguish and apprehension that the disaster could happen again at any rainy moment. They appeared resigned to their fate and totally devoid of any reliance on the authorities to protect them from the recurrence of the disaster.

The local press and the local chapter of the WWF has publish several articles and reports to the effect that Sarno has been betrayed and completely forgotten by the national authorities.

The disaster goes on, both on the mountains' slopes as well as in the minds of the people.

THE MEANING OF THE SARNO DISASTER

The Sarno event is only physically different in nature from most other disasters that are generally confined to a brief time of destruction that eventually terminates and permits the onset of recovery and reconstruction. Because of the geological configuration of the mountains and the proximity of an extensive habitat at its feet, any prolonged precipitation may, at any time, provoke additional mudslides and destruction, until badly needed, but enormously expensive, protective public works have been completed. This is not going to happen in the foreseeable future. Consequently Sarno and the surrounding areas remain under the constant threat of being buried under additional mudslides.

What is most important, however, is that the sociocultural conditions, both national and local, that account for the 1998 mudslides are still present and unremittingly operative. The government has been unable to formulate and enforce a rational plan of land use, conservation, and protection, or engage in a much-needed program of large-scale reforestation. The illegal construction of houses in the area has not abated, nor has the uncontrolled grazing that prevents useful vegetation from taking stronger roots on the mountain slopes. Summer fires (mostly started criminally by local people) continue to denude more and more acres of wooded mountainsides. The proposed holding dams to attenuate at least the first thrust of eventual mud slides have not yet been built.

What is most appalling is the fact that no comprehensive reconstruction plan has been formulated, and therefore those who lost their homes to the mudslide have been left to their own devices to find new abodes with the limited financial subsidies received from the government.

Many local young people have opted once again for the alternative of emigration, which had all but stopped in the years preceding the disaster. Of the 5,000 people that inhabited Episcopio, the Sarno suburb most badly affected by the mudslide, 1,500 have emigrated in the months since the event, apparently never to return again to their native home.

Emigration represents the most revolutionary response that an individual can make to an intolerable social condition. Emigration says that, however pleasant and comfortable one's native place may be, it is not worth holding on to, if it does not provide basic fulfillment of human needs. However unfamiliar, a foreign culture becomes more desirable and embraceable than one's own, especially if that native culture is characterized by a *negative culture of disaster*.

But not everyone in the Sarno area has opted for change. In the course of the past two years all evidence has pointed to the mayor of Sarno as being ineffective, incapable of making decisions and keeping the situation under control. He has been unable to motivate the state and the region to actually spend the several hundred million dollars allocated for reconstruction. Several court proceedings are pending against him and over half of the members of the city council (including some from his own party) have resigned in protest against his administrative policies, seen as tainted with considerable bribery, profiteering, and embezzlement.

Yet in the elections of April 2000 he was re-elected.

The regional governor, Antonio Rastrelli, on the other hand, who visited Sarno the day after the mudslide and worked hard to provide help and reconstruction funds, lost Sarno's electorate that voted overwhelmingly for his opponent, Antonio Bassolino.

EPILOGUE

Sarno can be viewed as a most glaring case of *negative disaster culture*.

Undoubtedly its geological conditions place the area at physical risk. But for hundreds of years a pattern of enlightened intervention at the hand of a centralized monarchy (the Bourbons), using heavy social control, had provided the necessary disaster mitigation. With the advent of democracy, however, the area has deteriorated into a free for all of deviant and often criminal behavior. The national and regional authorities have been incapable and/or unwilling to intervene and effect social control. The latency of the government has given local criminal chieftains, and the population in general, free hand to indulge in generalized criminal the consequences of which affect not only people but the ecosystem of the area as well.

The lack of preparedness for disaster and the inability to handle its onset and its aftermath are consistent with the overall negative culture of the area and make it inevitable that, like several other previous major disasters in the area (such as the 1980 earthquake of the nearby Irpinia and Basilicata), there will be no real recovery and reconstruction after the Sarno mudslide, but only an ongoing patch-up leading to further disastrous happenings in the future.

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