DRAFT

L'Unità, Wednesday, 09 May, 1973.

Uplift begins again at Pozzuoli.

Press conference with the CNR.

The latest information from the scientists. A tragedy that could have been avoided. Population join the fray.

"The current situation ... is unlikely to lead to a paroxysmal eruption in the near future." This is the most credible statement from the National Research Council (Consiglio Nazionale di Ricerca; CNR) on the bradyseismic phenomenon at Pozzuoli: a statement that, had it been issued in March 1970, might have averted a tragedy. As will be recalled, on 22 February 1970 this newspaper alerted the general public and scientific community to the rapid uplift occurring at Pozzuoli: the bradyseism - a characteristic of this volcanic region in which for centuries the ground has slowly subsided and risen at centimetres a year - had suddenly begun a rapid uplift that within months had raised the ground by 93 cm.

The official line during the end of that February revealed with absolute clarity the deficiencies of the scientific community. Explanations for the phenomenon spilled out from academics that had neither studied the Phlegrean area nor conducted serious research in seismology or volcanology. And since the opinion of a "university baron" could not be challenged, the hypothesis of an imminent volcanic explosion – an eruption – became magnified and used to justify an operation that had nothing to do with ensuring the security of the citizens of Pozzuoli. And so, on 1st March, after some weak tremors had been recorded (although these have occurred daily at Pozzuoli for centuries, it was the first time they had been connected with the bradyseism), and against advice from the local authorities in Pozzuoli, the Ministry of the Interior and Public Works took the decision to evacuate the old fishing quarter, rione Terra, the densely populated historic centre of Pozzuoli. The deployment of armed forces induced panic throughout the town. While the 600* residents of rione Terra – all fishing families – were moved to a building constructed as a mental hospital on the outskirts of Naples, 25,000 others abandoned the town fearing an imminent catastrophe. This last year, the bradyseism has changed direction and the ground is now subsiding. [**Check figure*: 6,000 in article from 22 February 1979.]

At a CNR press conference yesterday morning in Rome, Professor Schiavinato presented a giant compendium of the last three years of scientific research in the Phlegrean area and on the bradyseism of Pozzuoli. The phenomenon will certainly occur again, but it is not possible to forecast when. However, it is a phenomenon that historically has been preceded by easily recognisable precursors. The introduction to the volume notes that, owing to the volcanic nature of the area, "there is an appreciable risk in the long term and so it is necessary to ensure suitable systems for monitoring, forecasting and mitigation in the medium to short term." Professor Caputo writes that the seismic activity is notable but smaller than that at other active volcanoes, while geochemical and other data are as expected for quiescent volcanic areas and "extremely interesting" for renewing investigations into the exploitation of geothermal energy (jets and steam eruptions). The note concludes that there is an "appreciable, but long term risk" from volcanic activity.

DRAFT

We raised the question of the guarantees we can expect science to provide. Is it still possible that alarms may be issued that cause the type of social upheaval and major economic damage that occurred in February and March 1970? The CNR directors replied that they had not made any pronouncements at the time about what might or might not occur at Pozzuoli and that the CNR had carried out a programme of research that not only must continue, but would allow the continued acquisition of reliable data. At present, explained Prof. Caputo, earthquakes cannot be predicted and this is a topic of intense study around the world. For example, members of the CNR are preparing to visit the advanced seismic monitoring systems in Japan. When D'Alagno added that geochemical research is in a "disastrous" state, even though it is essential for identifying premonitory signals, we had confirmation that science is not yet able to provide a firm answer to our question. However, he replied that certain events are not random, so that we can start to move from probabilistic studies to forecasts.

Eleonora Puntillo

DRAFT

L'Unità, Monday, 14 July, 1975.

How to protect ourselves from earthquakes.

Meeting with scientists from the Vesuvius Observatory.

There is still a lot of ignorance, say Neapolitan scientists, recounting what happened following a long but weak tremor. "To confront natural disasters we must understand their socio-economic implications". Inadequate legal requirements are the main obstacle to prevention.

We have gone to find the seismologists who, a day after the last earthquake (a long, but weak tremor felt only in the upper floors of buildings in the higher districts of Naples) invited "information organisations to analyse natural disasters without recourse to emotive language, but in terms of their socio-economic consequences and the fact that it is possible to reduce their impact." The communiqué was followed over the telephone by statements less diplomatic about the behaviour of the authorities.

"We are extremely angry about the repeated ignorance shown in statements. This might be understandable from the general public, but not from public officials." We ask for details and are shown records and documents from the seismological research group – led by Professor Giuseppe Luongo – of the Vesuvius Observatory (now working in the new building next to the original Bourbon observatory).

It is no longer acceptable that the public engineers are sought for advice on what is happening. I understand the woman who asked whether she could return home with her children, but I send to the devil the professional who solemnly asks: "Is it a well-founded theory that another shock can be expected within 24 hours?" Certainly, after 12.11 on the 19th, the telephone was constantly ringing at the Observatory: the state police, prefecture, civil engineers and district technical officials wanted to know "how will the seismicity develop?". Exasperated, we replied that we are not astrologers – and a journalist called us inadequate.

The (State) Civil Engineers – an organisation that should consist of qualified technical experts – sent an official fax "Please could you kindly communicate whether there have been any developments in the seismicity?" Answer: "No."

This is the result of bureaucracy, but also of ignorance and incompetence, and presents a danger even greater than the earthquake itself. The group of young research scientists drew up a deliberately provocative communiqué. "A phenomenon of this type is normal in a region with the geology of southern Italy. Whether the impact is disastrous is linked to such factors as unplanned urbanisation, the lack of anti-seismic norms across the territory, on top of the psychological factors related to a poor understanding of the phenomenon."

A Punishment?

To begin with, say Observatory researchers, earthquakes continue to be described emotively. They are still viewed as a punishment from God, something that must inevitably cause damage and frightening disaster.

DRAFT

[*Some text illegible owing to fold in paper*] "The flagellation of the 38 was in repentance for the will of the Lord to persecute the population of Melfi, in Basilicata" is a text from 1851 (?), but not much has changed since. Yet today we understand the consequences of earthquakes and can protect ourselves from their impact. And such prevention – which will save lives and considerable economic losses – is easy. First we need the political will, which is still lacking in Italy, not only in the case of earthquakes: think of Vajont, or abusive building, or the collapses at Pozzuoli.

There are types of consequence that appear as manna from heaven. The structures most damaged by earthquakes are old buildings, especially in historic centres, which happen also to be targets for so-called redevelopment and the displacement of the poorest communities living there. Since the public authorities have paid no interest in stemming such exploitation of communities, it seems as if current anti-seismic regulations are not designed to avoid the disastrous consequences of earthquakes. The latest regulation, in 1961, even subdivided seismic regions by administrative district.

Worst of all – and clear evidence of a dumbfounding level of ignorance – is the denial of considering volcanic districts as seismic. Hence Tuscania (18 deaths and enormous losses) and Pozzuoli are not in seismic districts; neither is Naples and its province, except for Casamicciola, the tiny piece of Ischià struck by a devastating earthquake in 1883.

Looking out from the marvellous location of the Vesuvius Observatory, the seismologists can see the flow of cement snaking up the flanks of Vesuvius: Torre del Greco has been destroyed six times; the 1631 eruption of Vesuvius killed 13% of its population. Thirteen percent today represents about 60 million people, before accounting for the destruction of buildings and cultivated land.

The latest bulletin from California (it is called a bulletin, but is a 500-page book, weighing almost two kilos, that has been distributed worldwide) talks of the probable cost from geological hazards in that region: 55 billion dollars across several sectors. Appropriate preventative measures – described in detail – could save 38 billion at a cost of only 6 billion dollars. It is a crucial argument, based on efficient action that, say the seismologists, has not been understood in Italy, given that the proposals from the Geophysical Commission for Anti-seismic Regulations have not even been considered. They have asked to develop a national seismotectonic map and to add to the zoning of seismic activity a measure of the level of risk. This is normal practice in the Balkan countries, where the style of building construction is adapted to the local geology. But this is not done in Italy.

At school

The researchers point out that anti-seismic measures will increase costs by 10% at most. This is the investment to protect lives and damage to property. "This type of prevention is like medicine: we don't need to wait for people to fall ill to cure them - and we don't need to wait for buildings to collapse to make money in reconstruction."

For this reason, the seismologists have decided to apply their work for social benefit. They have volunteered to hold seminars in schools (where they are needed, especially for the teachers and professors); they have visited the factories along the Phlegrean coastline, distributing clear and simple information leaflets to dispel current superstition. First on the

list of rules is don't panic during an earthquake. Usually it is better to stay indoors, rather than run outside to be struck by falling masonry. Protect yourself under a table, bench or chair, or in a doorway. Stop driving and stay in your car and, when outside, stay away from buildings. Do not use candles, matches or fire of any sort.

In six months, 1,300 pupils and teachers have visited the Observatory from 18 schools, while seminars have been held in 9 schools to an audience of 1,500. The researchers believe that changes at schools are essential to change attitudes also among public officials. Indeed, at school they say it is absurd that unique volcanoes are in private hands (Solfatara in Pozzuoli), that administrative bodies do not want to or do not know how to make use of the instruments for monitoring earthquakes (accelerometers), and that the National Seismological Service is not assigned the task of answering questions over the telephone about "how will the seismicity develop?"

Eleonora Puntillo

DRAFT

L'Unità, Sunday, 16 May, 1976.

Working for seismic risk map in Naples.

Why we must heed the warnings of geologists.

How many cities have an action plan for disasters? Congestion from cars is extremely dangerous. The mayor meets fire officers and experts in City Hall.

Just 48 hours after the earthquake in Friuli, the Mayor of Naples Valenzani has convened a meeting to address how to prevent disasters from earthquakes and other events that can cause such destruction. Although the question may seem obvious today, it is one that is soon forgotten. The meeting was organised very quickly to avoid the objections that have arisen in previous cases across a city riven by superstition.

A novelty of the meeting was the presence of a researcher from the Vesuvius Observatory, Prof. Giuseppe Luongo, as well as the chief of the fire brigade, deputy chief of police and an official from the Carabinieri. They highlighted the need to overhaul security measures that for a long time have been overlooked in a city where only mentioning the problem provokes the reply "Why are you thinking about this? Is something about to happen?" For example, it was decided to draw up legal procedures to prevent courtyards being transformed into car parks, where hundreds of cars are crammed only centimetres from the entrances. In case of a fire, no matter how quickly residents leave their buildings, only those in good physical shape would be able to scramble past the iron barrier of automobiles.

For 15 years, the fire brigade has been asking in vain to keep fire hydrants in the streets free from obstruction. Parked cars regularly block fire hydrants and – especially in the older parts of the city – even the access of fire engines to entire neighbourhoods. "For 15 years we have been asking for this problem to be addressed" said Fire Chief Ing. Lo Basso, adding that yesterday's meeting was the first he knew to have been convened by a mayor to find a solution. In a few days, the fire hydrants will be protected by stakes, while new regulations are being discussed against cars being parked in courtyards and narrow streets.

The most innovative feature of the meeting was introduced by the Vesuvius Observatory scientist. People must understand what an earthquake is and how they can protect themselves; they must realise that methods exist for avoiding disasters and losses and that it is important to prepare. How? To begin with, the Provincial Administration of Naples has obtained a volcanic risk map from the Vesuvius Observatory and has assigned two people to liaise with seismologists.

In addition, it was proposed that Naples and other communities along the coast would commission the Vesuvius Observatory to prepare a seismic risk map - work which could begin immediately using data already available. Thus, seismic networks are already operating across the Neapolitan area: the network of seismometers installed during the scare from the bradyseism of Pozzuoli (which precisely demonstrates the damage caused by ignorance and by the presumption of certain "scientists" completely detached from social reality); the network monitoring Vesuvius; and, finally, an international scientific organisation that asks only to work for the common good. Establishing links between civil administrations and the

Observatory can only be beneficial – for example, the "discovery" of valuable networks that are not used, such as ENEL's seismic network in Carnia, installed for the protection of dams in Tolmezzo and along the Tagliamento, but whose data have for years absurdly been available only to ENEL. These data would help to identify vulnerable communities within seismically-active districts, where they could implement construction codes to prevent buildings from collapsing like a house of cards. But they have yet to be declared and utilized.

Prevention is a wide-ranging goal that involves several sectors, including reinforcing buildings - from historic town centres to schools – acquiring and disseminating scientific information and designing public control measures. In Naples, it has already begun.

Eleonora Puntillo

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DRAFT

L'Unità, Thursday, 22 February, 1979.

When they emptied Pozzuoli.

The Bradyseism that shocked the population in February 1970.

Scientists and the authorities did not understand the phenomenon and ordered a hurried and useless evacuation. Today the district is being explored to take advantage of the energy "mine" hidden underground. The battle to clean up the old town.

A 60-metre tower rises above the hills between Pozzuoli and Bacoli. It supports a drill that has reached almost one and a half kilometres below the surface. It's searching for geothermal energy that can be used to generate electricity. Today the newspapers have announced that the ground boiling under Pozzuoli will bring definite advantages – ENEL, AGIP and SAIPEM aren't exploring there with the latest equipment for nothing. On the same day nine years ago, 20th February 1970, the announcement that heating of the earth had caused the ground to lift upwards by more than a metre was the harbinger of tragedy. The news claimed the uplift to be a great, marvellous and important scientific phenomenon, sufficient to attract the attention of scientists from around the world. For this reason, l'Unità reported the phenomenon as front-page news. Ten days later, the entire territory of Pozzuoli had instead become the scene of a collective tragedy whose consequences are still being felt.

The natural phenomenon of ground uplift – frightening only because unknown and terrifying only because of the mysteriousness, jealousy, conflict and arrogance of the official scientific community - was used to clear, evict and deport the population.

On the 2nd March, a small seismic shock induced Prof. Giuseppe Imbò, Chair of Volcanology [at the University of Naples], to declare that an eruption "might be possible from one moment to the next", but also "within ten years", or "by the end of the century", "perhaps offshore in the gulf", "but also possibly beneath a populated area". Similar comments were made by illustrious experts at a round-table discussion organised by the *Corriere della Sera*. In those days, the Prefect, who was responsible for public works, and the military entered into action. Six thousand people were ordered to leave *Rione Terra* (the oldest, overcrowded acropolis of the Greek city). The first 1,500 were forced onto trucks. At the sight of the evacuation, and the cries and tears of the people, panic spread through the town like wildfire, and 20,000 people packed their cars and fled.

Sergio D'Oriano, elected only a few days ago as Pozzuoli's communist mayor, remembers: "I was a 20 year old student, just 48 hours after an appendix operation ... the hospital was the first to be evacuated. Everyone was scared and nobody trusted what they were being told. We were loaded by stretcher onto trucks, before starting an extremely long journey on roads jammed with those heading to Naples and inland." At the time, the city council was run by the Christian Democrats and the mayor, Prof. Gentile, showed weak leadership by opposing the evacuation only with the threat to resign – a threat which he later withdrew.

"If this should happen today," said comrade D'Oriano, "I would react differently. No catastrophe struck Pozzuoli – and, even if one had, the geological features of *Rione Terra* (it is an immense rock with foundations kilometres below the surface) would render it among

the safest places to be. Instead, it was precisely that impoverished district which was chosen for the frightening deportation "experiment"."

The sudden blow (*mazzata*) in March 1970 was severe but incomplete. Three days after the evacuation, workers had returned to their factories, even though the Press were shouting they had been damaged and were threatened by tsunami and an eruption waiting to happen. And they didn't leave their work. Giuseppe Luongo, 40, lecturer in physical volcanology at the university and in charge of seismology at the Vesuvius Observatory, remembers that the days were made more difficult by the behaviour of the official scientists.

"We never convened round-table meetings to discuss and compare our ideas and experience. The youngest and the rebellious were excluded. Some of us took measurements at Pozzuoli during the night, but in the morning were shut away in the Institute."

In practice, Pozzuoli and all the decisions affecting thousands of people – such as job opportunities, lines of research, the choice of text [?] and of assistants – remained the exclusive right of the Professors.

Indeed, when volcanologists Haroun Tazieff and Izumi Yokoyama arrived from France and Japan in mid-March, they soon left in desperation.

"The people need to gain control of the sources releasing so-called scientific information and replace these with a more transparent and democratic process that would provide a more balanced view of these natural phenomena," says Giuseppe Luongo, who cites the case of the Centre for Studying the Phlegraean Bradyseism. "This initiative was deliberately allowed to fail. It is important to re-launch it as a centre for encouraging new scientific research and for providing responsible (reliable) information for urban and agricultural development, as well as for geological studies."

Today, the land beneath Pozzuoli is stable, having been uplifted by 1.5 m in 1972, followed by a slight subsidence of 10 cm. From the great fires below the surface, the borehole will supply much needed energy for the development of the whole district – the mayor is already in negotiation with public companies.

Meanwhile, at the town hall the third from last meeting was recently convened of the commission charged with co-ordinating the nationwide call for redeveloping *Rione Terra* [thanks to a law pushed through by the Communist Party ...]. It has led to the development of *Rione Gescal* [Toiano], where fisherman find themselves several kilometres from the sea, together with 14,000 other evacuees. After seven years, it is already a frightening ghetto. The Administration has tried to prevent an exodus from the centre with plans for redevelopment. The economy of the people distraught by the evacuation and deportation has yet to rise again [like the ground].

Eleonora Puntillo