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## Considerations About Some Aspects of the 23rd November 1980 Earthquake

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# Considerations About Some Aspects of the 23rd November 1980 Earthquake.

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## INTRODUCTION

The macroscopic effects of the earthquake of the 23rd of November 1980 in southern Italy are well-known. The purpose of this short paper is to present after about five months, some more exact testimonies with some considerations about numerous questions connected to the geotechnical and geological problems in seismic areas. We have to be precise that we, in this paper, contemplate the MURO LUCANO and CASTELGRANDE areas (in Basilicata) Ffig. 1)



*fig. 1*

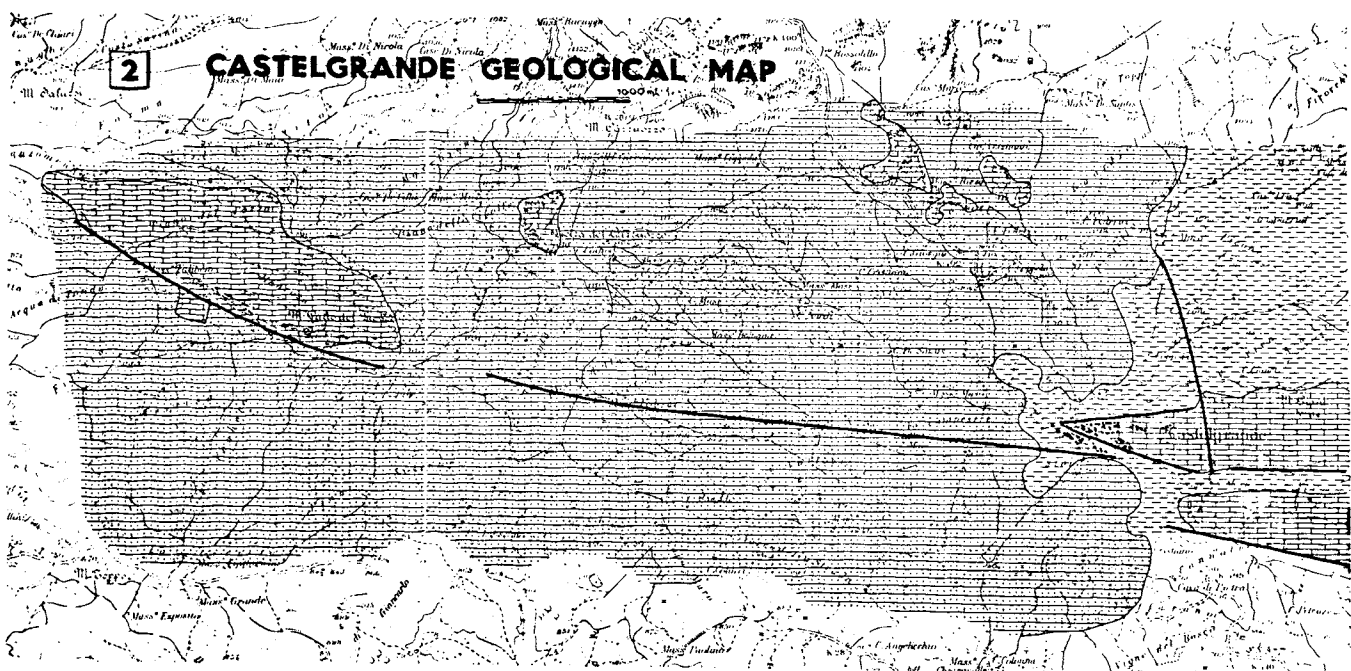
## MORPHOLOGICAL AND TECTONICS SHORT NOTICES

The morphology of the areas considered is characterized by steep slope reliefs in plasticless soils and by slight slope versants in more plastic soils.

It is interesting to note that there are two faults systems: the most important one with strike NW-SE and the other one perpendicular to the first.

## FIRST CONSIDERATION: FAULTS BEHAVIOUR

We want to put in evidence that the behaviour of the faults during earthquakes is a still unsolved matter. In fact the faults indicated in the pictures have had, during the earthquake of the 23rd of November a completely different behaviour: the first ones (fig. 2) have had sudden movements which produced tremendous damages; the second one (fig. 3), on the other hand, did not have any movement. Paradoxically the area on the second fault is the damagedless side in the little town which has had, anyway, many damages.



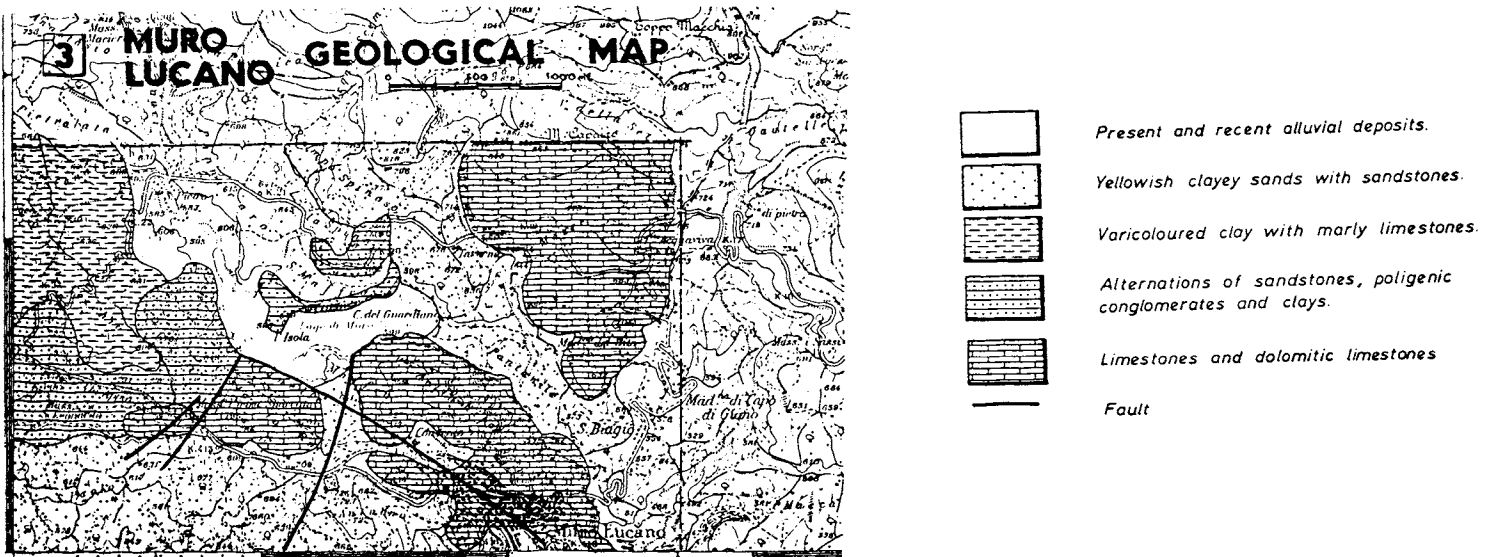


Figure 3.

We have to precise that this study has been done on the examination of aerial photographs.

What we wrote above shows that the behaviour of the faults during earthquakes has to be studied more.

#### SECOND CONSIDERATION: SITE RESPONSE PROBLEMS

We want to put in evidence as the local site response has been an important parameter during the earthquake of the 23rd of November 1980. The damages map (fig. 4) in the living area of Castelgrande shows as very near buildings have had very different damages (it is necessary to precise that the buildings, many of them are in stone structures with surface foundations, are very similar both for the height and for the shape, as shown in fig. 5). It is useful to dwell upon two

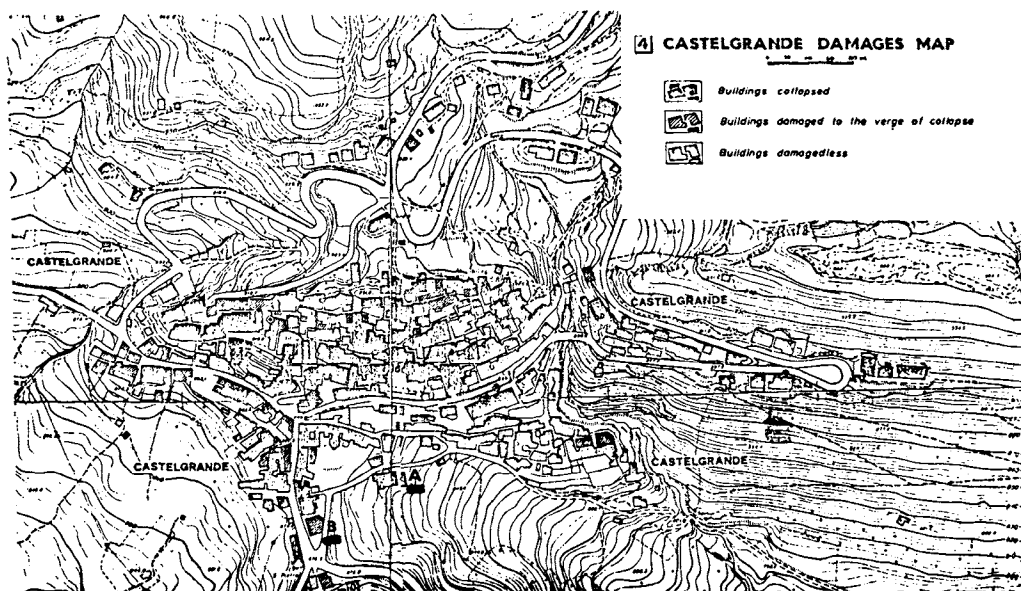


Figure 4.

reinforced concrete buildings (A and B in fig. 4) very similar but very differently damaged: The first one (A) has had insignificant damages, the other one (B), on the contrary, was damaged to the verge of collapse (fig. 6). About this second case, it is interesting to note that the building was situated in the vicinity of the fault considered above.



Figure 5.



Figure 6.

Apart the shown example, it has to be said that similar cases have happened almost everywhere (in the living area of Potenza there are contiguous buildings exactly alike which have very different damages).

To conclude this consideration we re-affirm that it should be necessary to study the local site response problems and the interaction problems by the "complete methods" in which the motions of the soil mass and the structure are determined simultaneously.

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