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MONOGRAFIE FINALI

Vol. 8

SOMMA-VESUVIUS

Edited by
ROBERTO SANTACROCE



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PROGETTO FINALIZZATO 'GEODINAMICA'

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SOMMA-VESUVIUS

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FOREWORD

The main objective of Subproject 3 of the Italian Geodynamic Projects was that of promoting research in the field of active volcanology aimed at the mitigation of volcanic hazard. The actions undertaken included the improvement of the permanent monitoring networks on active volcanoes, and the sponsoring of research on eruptive mechanisms and in the field of volcanic hazard assessment.

Advancement in this last sector required, in turn, a deep revision of the previous basic knowledge on volcanic geology, stratigraphy and tectonics, as well as a careful reconstruction of the volcanic history. The obtainment of a new geological map at adequate scale of each active volcanic area of Italy was one of the main objective of this research plan. Considering that detailed geological maps had been recently published on Etna (1982) and on the Aeolian Islands volcanoes (1980), the main effort was concentrated on the active volcanic areas of the neapolitan region (Phlegrean Fields, Vesuvius, Island of Ischia).

In the case of Phlegrean Fields and Vesuvius, the achievement of this objective has been greatly facilitated by the existence of a parallel and important research effort made by AGIP-ENEL Joint Venture and aimed at the geothermal exploration of the two areas. The AGIP-ENEL programme included detailed geological mapping, geophysical investigation (gravimetric, aeromagnetic and geoelectric surveys) and exploratory drilling. A cooperation programme was established between AGIP-ENEL and the Geodynamic Project, and some of the geological and petrological investigations on Vesuvius were carried out through the collaboration of AGIP researchers with the Department of Earth Science of the University of Pisa.

The present monograph, edited by Roberto Santacroce, is accompanied by a new 1:25,000 scale geological map, that alone represents a marked improvement of the knowledge of the area (previous maps were those of the Geological Survey of Italy, 1:100,000 - 1971, and of Johnston Lavis, 1:10,000 - 1891).

The monograph contains also gravimetric and aeromagnetic maps and related interpretation. It summarizes all the results of the surface and subsurface geological, petrological and geophysical studies.

A new structural model has been obtained for Vesuvius, as well as an original behaviour model of the Volcano based on the detailed reconstruction of the eruptive history and on petrological data. The model has been already utilized for assessing the eruption to be expected from Vesuvius in case of activity renewal. As a whole, the monograph provides a sound base for more detailed studies oriented to the refinement of volcanic hazard assessment presently under progress.

November, 1987

FRANCO BARBERI
Professor of Volcanology at the University of Pisa
Director of the Italian Geodynamic Project

P R E F A C E

Vesuvius is probably the most famous volcano in the world because of the easy accessibility, the spectacular almost persistent activity lasted for three centuries until 1944, and because of its largely documented eruptive history.

The history of volcanology itself begins at Vesuvius thanks to the description of Pliny the Younger to Tacitus of the A.D. 79 "Pompei" eruption. Since that time hundreds of books and articles have been written dealing with the different aspects of the activity, structure, nature, geography of the volcano: the 290 references cited in the present monograph provide only a partial overview of the available documentation. This extremely abundant literature lacks, however, of papers containing a synthesis of volcanological data, being generally limited to specific arguments, here more geological or geophysical, and there more petrological or mineralogical.

At the end of 1983 I was entrusted with the preparation and editing of a monograph on Vesuvius, which should summarize the results of the research efforts promoted and sponsored since 1976 by the Italian Geodynamic Project. In particular this monograph should provide a description of the new 1:25,000 scale geological map. The acquisition of new data was completed in 1985, but most of the field data were collected prior to 1983. Since then field work has continued and some further progress has been achieved, whose results have been published in international journals.

Although possibly partly out of date on the detailed description of some eruptions, the present monograph provides for the first time a comprehensive picture of the geological, geophysical and petrochemical aspects of the wonderful volcano.

November, 1987

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