



Contributions of
Nick Ambraseys
to earthquake
science: geology,
tectonics and
historical studies

with thanks to:
Roger Bilham
Charles Melville
John Douglas
Xeni Ambraseys



Greek Navy 1954

lists 46 previous tsunamis from 1400 BC, but:
“in none of the references is the original source of information given... and in many cases the dating of events is incorrect” (Ambraseys 1960)



Amorgos 1956



Skopje 1963

Field missions to major earthquakes in:

Iran: 1962, 1968, 1970 (twice), 1972, 1977

Yugoslavia: 1963

Italy: 1976

Rumania: 1977

Algeria: 1980

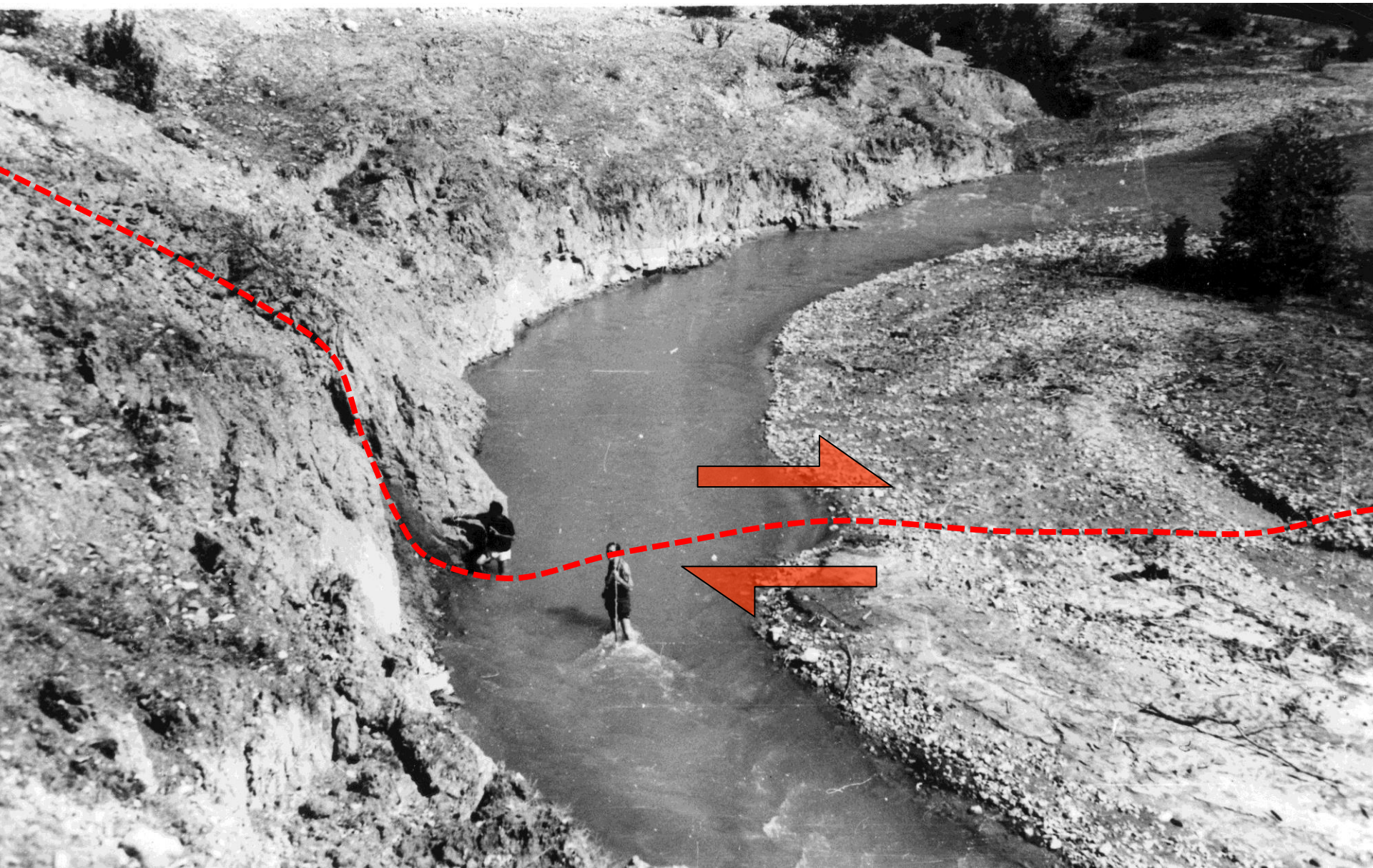
Greece: 1965, 1966, 1999

Nicaragua: 1972

Pakistan: 1974

Yemen: 1982

Turkey: 1966, 1967, 1970



Mudurnu, Turkey 1967



Gediz, Turkey 1970



1978



Gediz, Turkey 1970

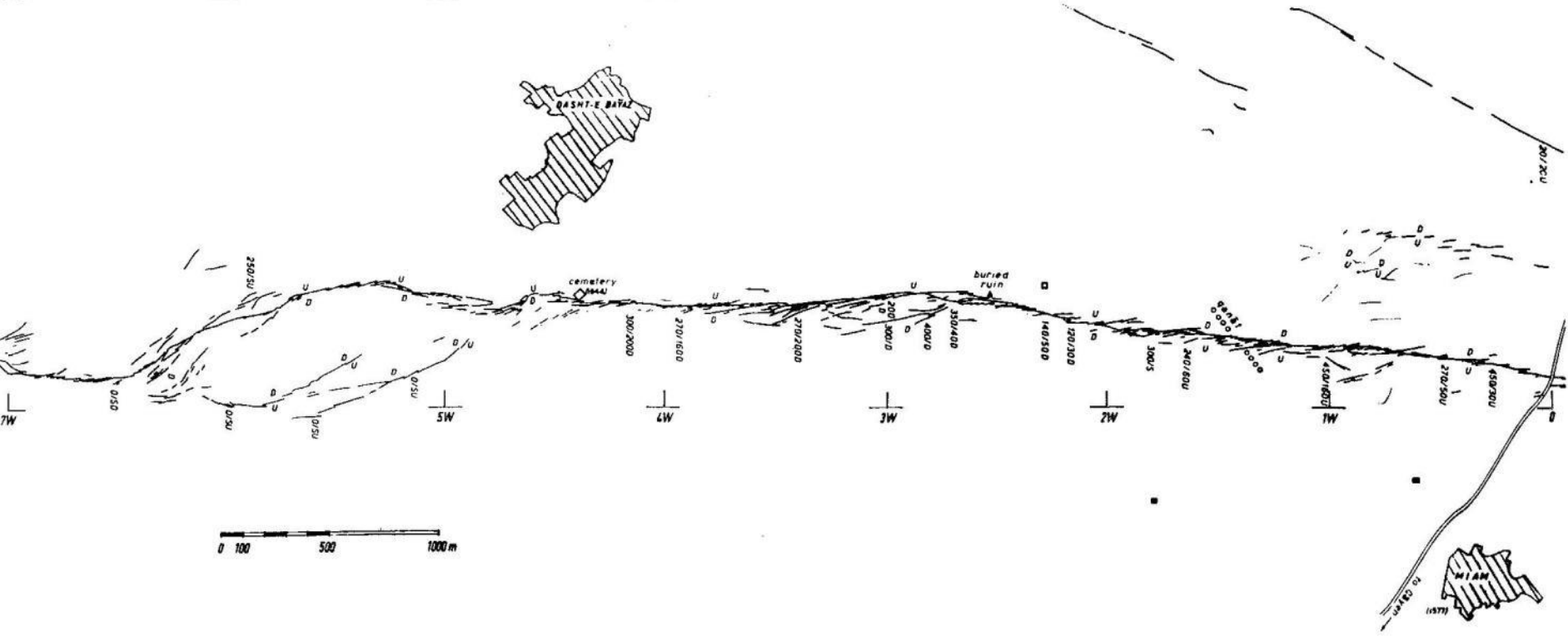
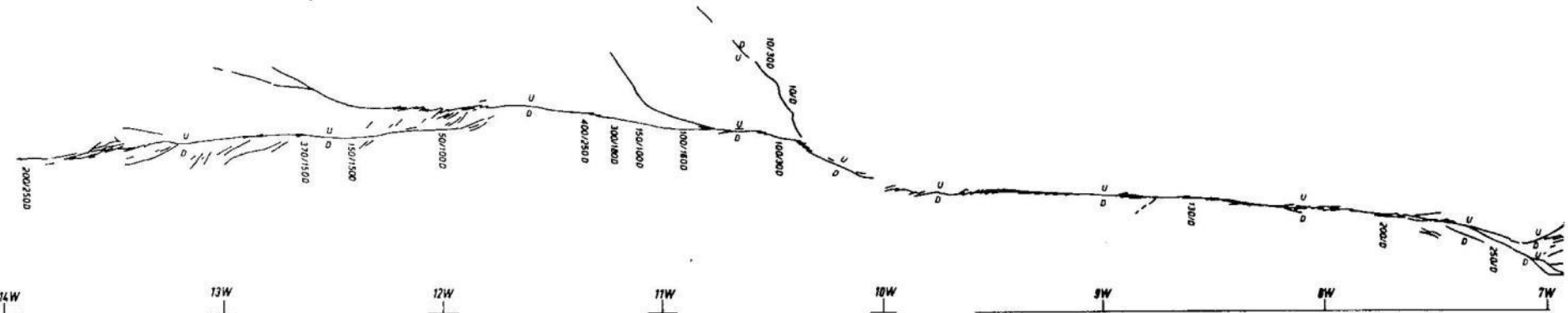


1978



Dasht-e-Bayaz, Iran 1968

c 100m



Dasht-e-Bayaz, Iran 1968

1 km

Ambraseys & Tchalenko, BSSA, 1969

ELEMENTARY SEISMOLOGY

By CHARLES F. RICHTER

CALIFORNIA INSTITUTE OF TECHNOLOGY

W. H. Freeman and Company (1957)

SAN FRANCISCO AND LONDON

Bulletin of the Seismological Society of America. Vol. 54, No. 6, pp. 1875-1888. December, 1964

BODY FORCE EQUIVALENTS FOR SEISMIC DISLOCATIONS

BY R. BURRIDGE AND L. KNOPOFF

ABSTRACT

An explicit expression is derived for the body force to be applied in the absence of a dislocation, which produces radiation identical to that of the dislocation. This equivalent force depends only upon the source and the elastic properties of the medium in the immediate vicinity of the source and not upon the proximity of any reflecting surfaces. The theory is developed for dislocations in an anisotropic inhomogeneous medium; in the examples isotropy is assumed. For displacement dislocation faults, the double couple is an exact equivalent body force.



... and many more following up historical earthquakes: **5 years in the field**

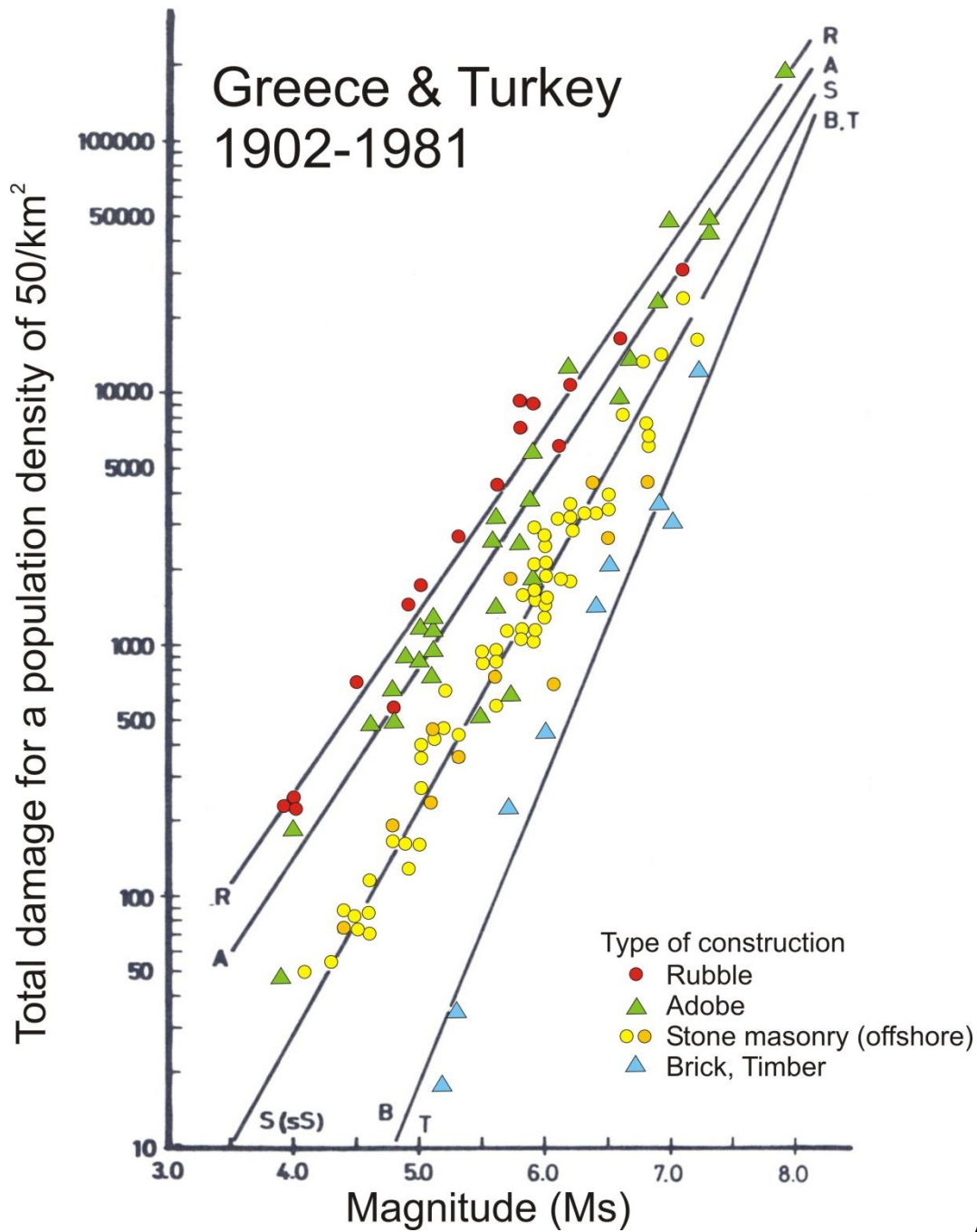


Bam, Iran 2003

Importance of
variability in local
construction and
design



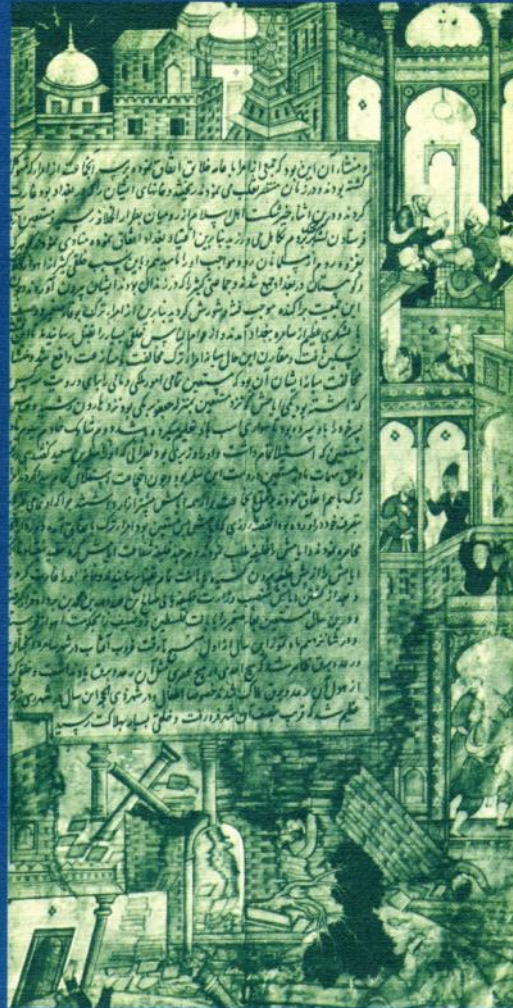
Pattan, Pakistan 1974



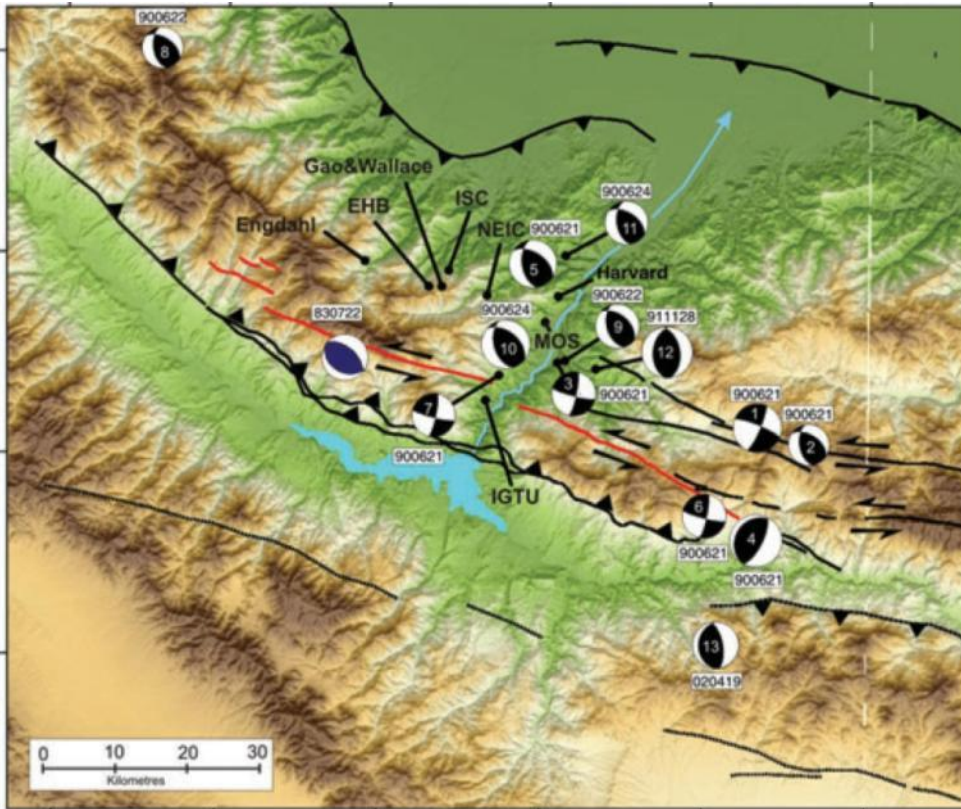
A history of Persian earthquakes

CAMBRIDGE
EARTH SCIENCE
SERIES

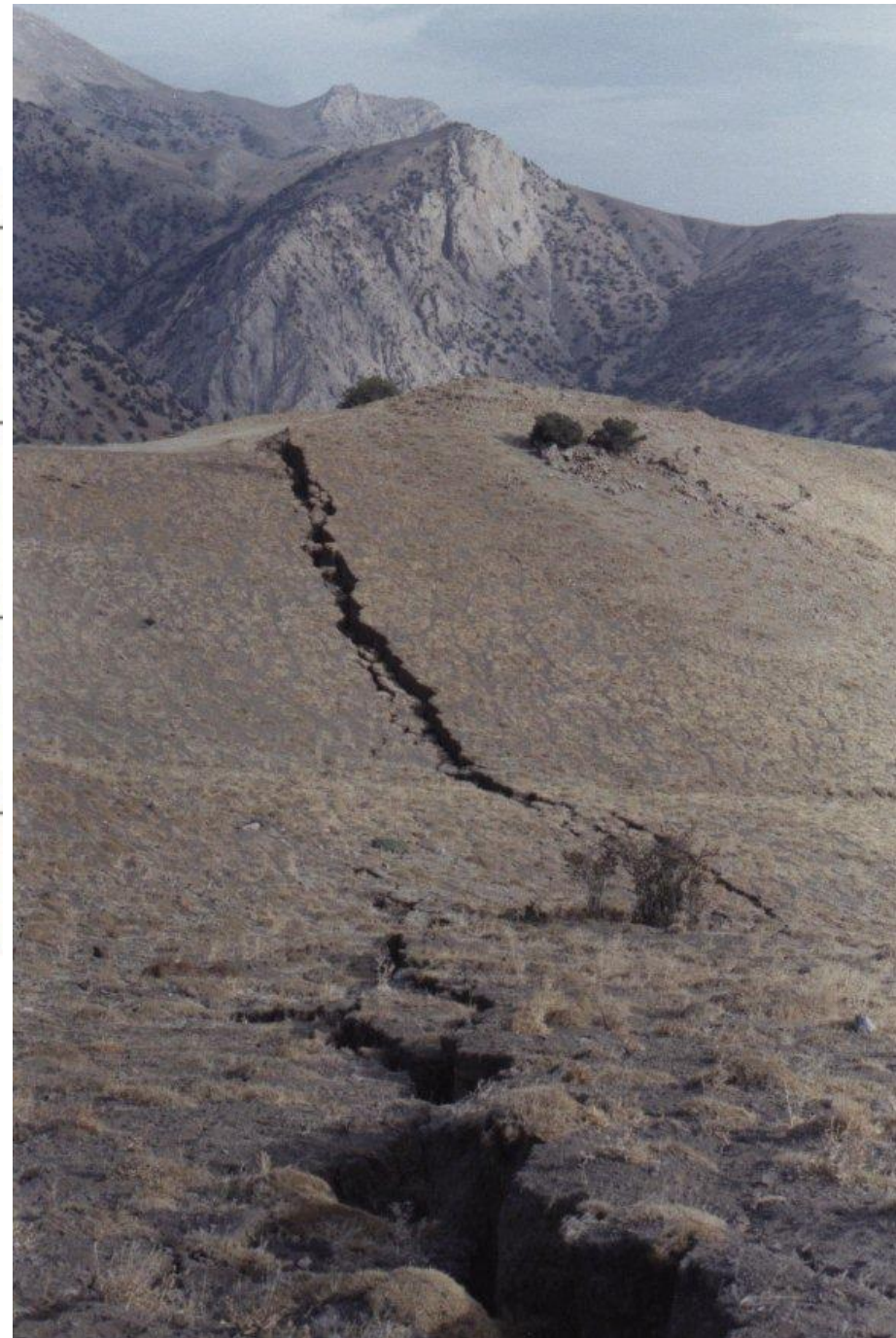
N.N.AMBRASEYS
AND C.P.MELVILLE





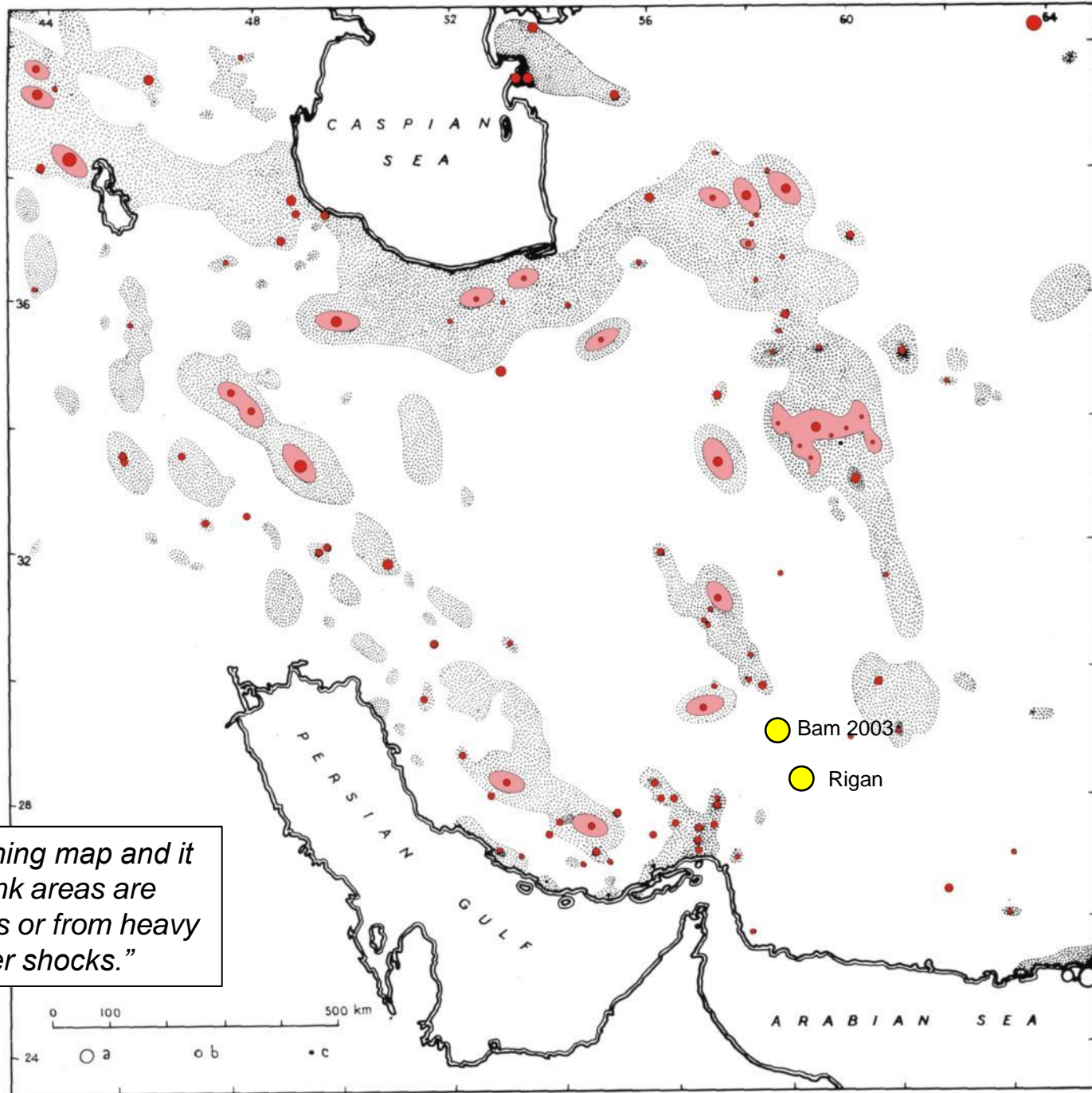


Rudbar 1990

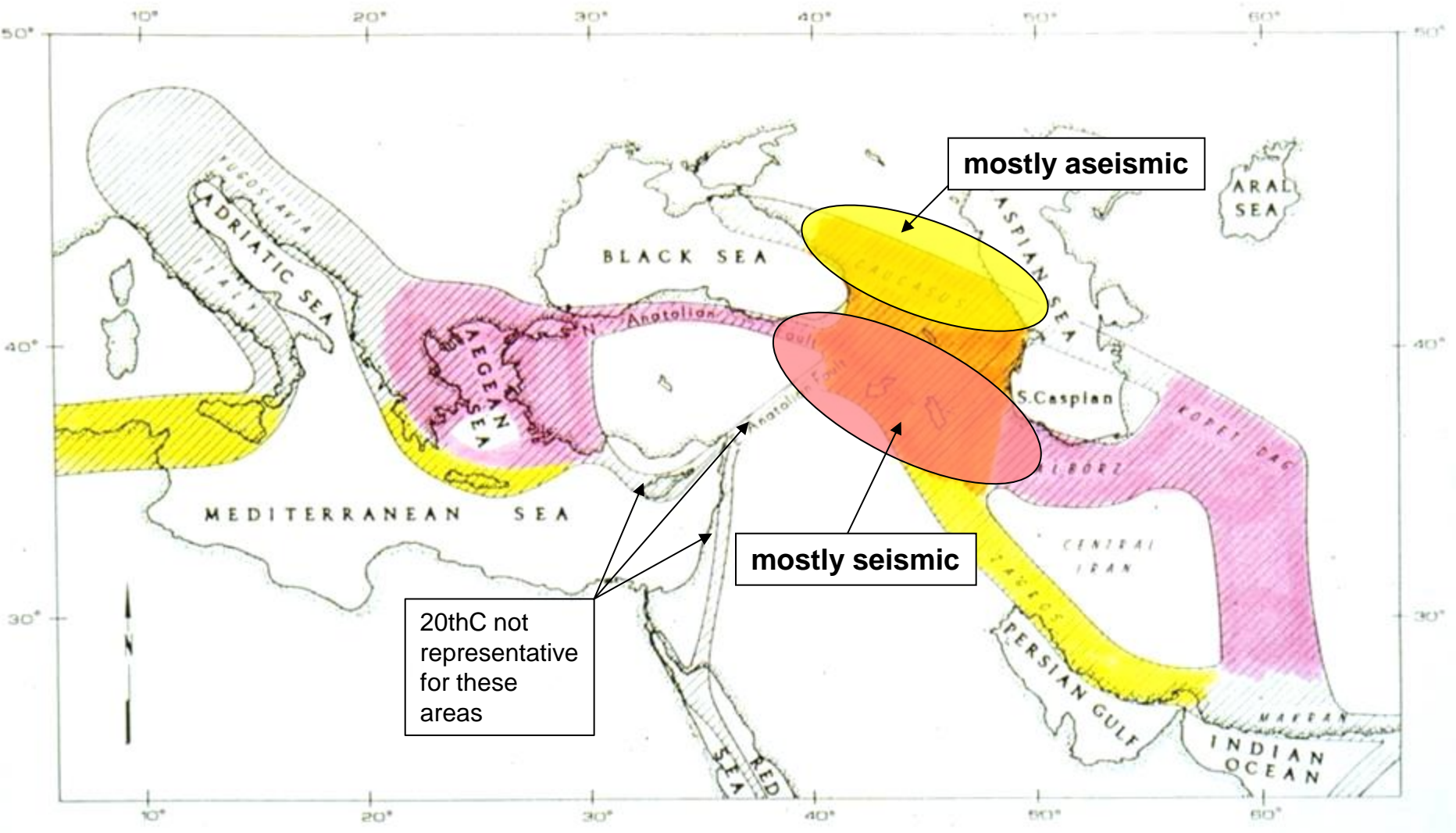


Earthquakes are often on faults that were unknown beforehand

20th century earthquakes
1900-1980 (red)
superimposed on
areas affected
AD700-1899 (grey)



“...this is not a seismic zoning map and it does not suggest that blank areas are unaffected by earthquakes or from heavy damage caused by smaller shocks.”



mostly aseismic

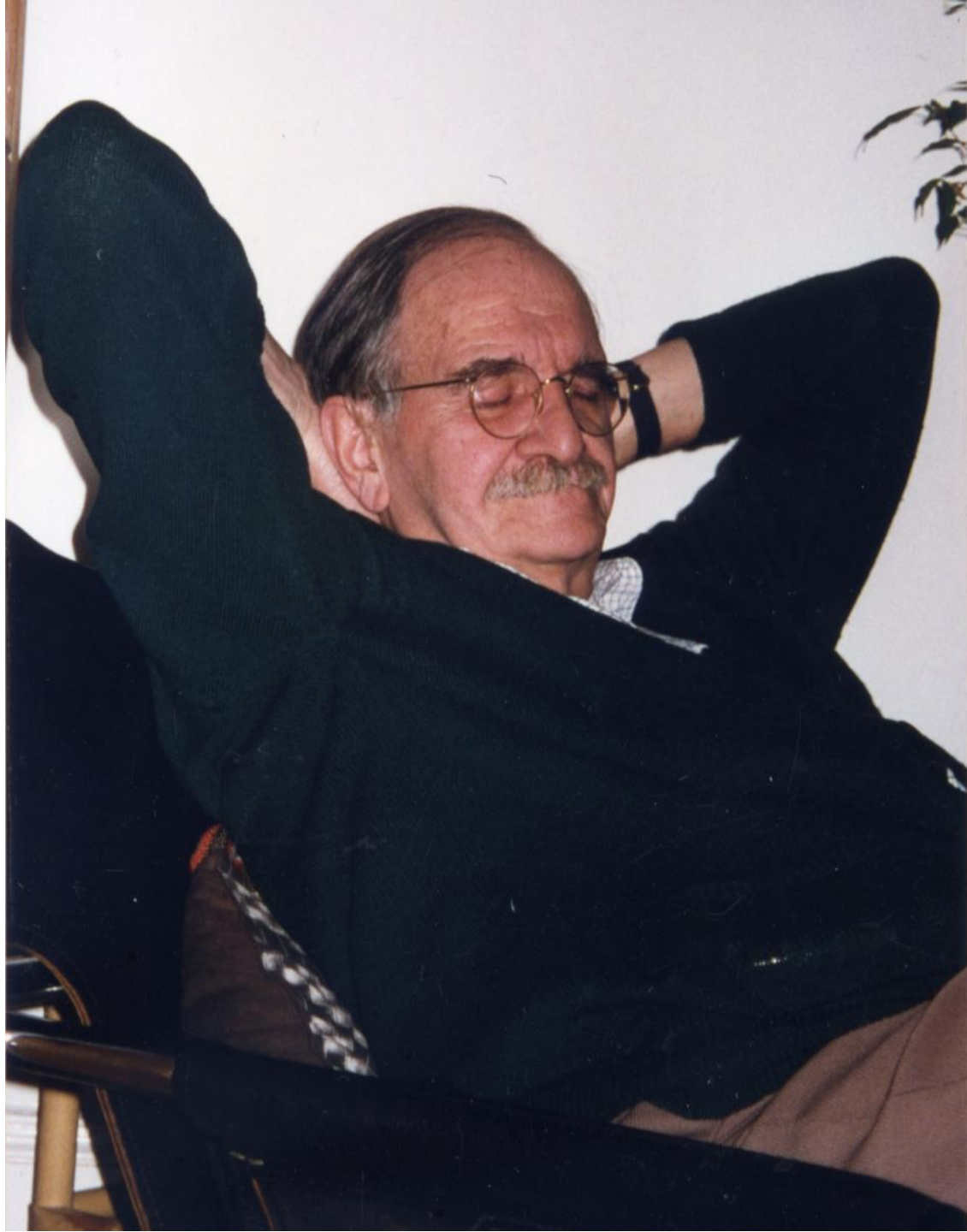
mostly seismic

20thC not representative for these areas

Importance of aseismic creep

From earthquakes:
1900-1985

- ~100% seismic
- 10-50% seismic
- <10% seismic







The collapse of buildings in earthquakes are not acts of God.
All too often nowadays they are acts of criminal negligence.



Ushural, Kazakhstan 2012



Leninakan, Armenia 1988

‘...in some countries earthquake regulations and building control are instructions, in others suggestions, but in many they are simply decorations or empty words.’

Corruption: ‘...the abuse of entrusted power for private gain in the siting, design, construction and maintenance of engineered structures in seismic regions’

COMMENT



Port-au-Prince, Haiti, 2010.

Corruption kills

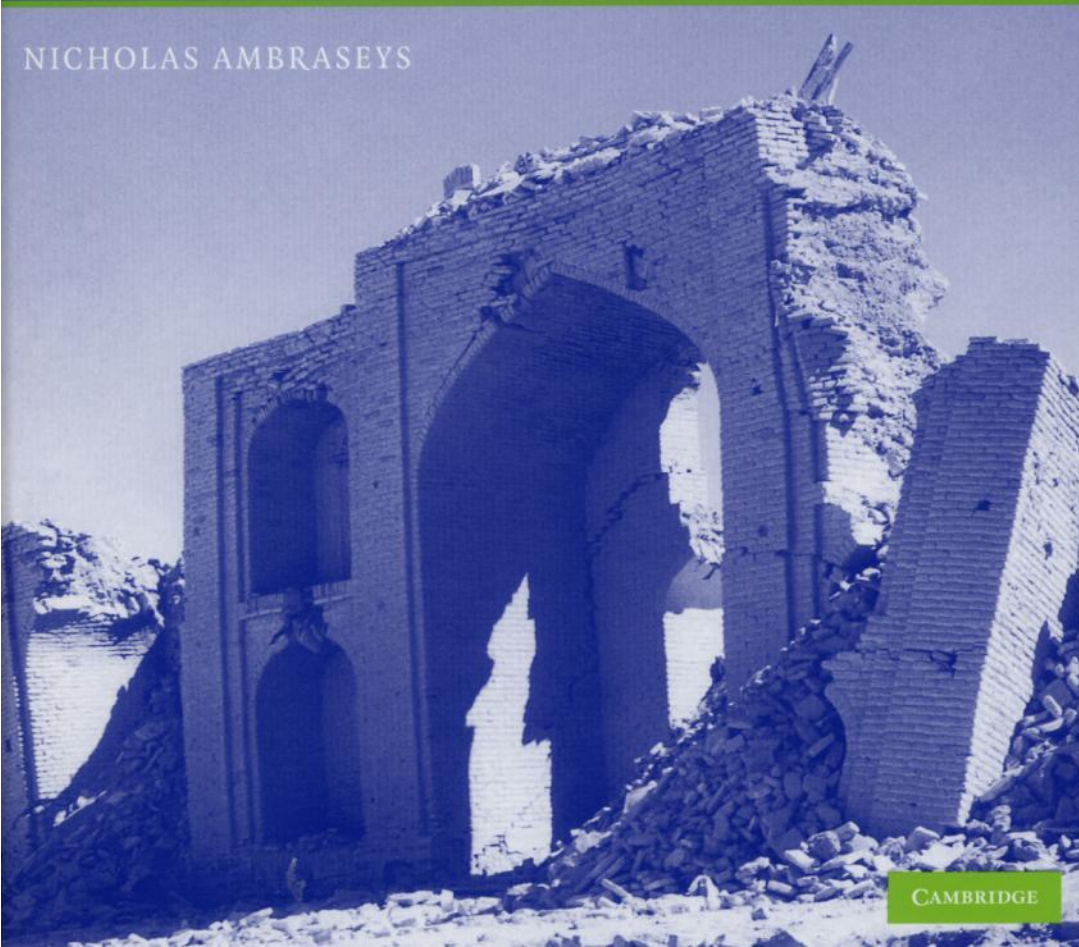
On the anniversary of Haiti's devastating quake, **Nicholas Ambraseys** and **Roger Bilham** calculate that 83% of all deaths from building collapse in earthquakes over the past 30 years occurred in countries that are anomalously corrupt.

Ambraseys & Bilham, *Nature*, 2011

Earthquakes in the Mediterranean and Middle East

A Multidisciplinary Study of Seismicity up to 1900

NICHOLAS AMBRASEYS



CAMBRIDGE

Books on historical seismicity of:

1982 ***Persia*** (with C. Melville)

1994 ***Arabia and Africa***
(with C. Melville & R. Adams)

1995 ***Turkey*** (with C. Finkel)

1999 ***Iceland*** (with R. Sigbjörnsson)

2001 ***Central America***
(with R. Adams)

2009 ***Mediterranean & Middle East***

+

over 300 journal articles