

OCCURRENCE OF DESTRUCTIVE EARTHQUAKES IN THE CARIBBEAN AREA

by

J. Grases G. (I)

Abstract

Historical evidence of destructive events in earthquake active regions where written records go back for several centuries, have shown periods of dissimilar activity within the same region. Based on the available historical and instrumental information related to the occurrence of destructive events in the Caribbean area since the XVIIth century, migration patterns have been observed, these giving rise to critical regions.

On the basis of the space-time pattern of occurrence of strong earthquakes in some active areas of the world, it has been suggested that relative motions at plate boundaries are not continuous, leading to the idea that for a given time, along the same boundary, there ought to be zones of dissimilar activity. These would move in time or migrate with a certain velocity. A summary is presented here, of the results so far obtained, when looking at the space-time pattern of the destructive earthquakes since the XVIIth century of three areas of the Caribbean plate: (i) in the Middle American region associated with the Pacific active seismic belt ($14^{\circ}\text{N}-91^{\circ}\text{W}$; $9^{\circ}\text{N}-83^{\circ}\text{W}$), four cycles of seismic activity advancing from NW to SE at a mean rate of $4^{\circ}/\text{century}$, are apparent. (ii) in the Colombian-Venezuelan eastern Andean ranges, followed by the Bocono Fault system ($4^{\circ}\text{N}-75^{\circ}\text{W}$; $11^{\circ}\text{N}-67^{\circ}\text{W}$), it is possible to depict five cycles of activity advancing from SW to NE at a mean rate of $8^{\circ}/\text{century}$. (iii) in the northern border of the plate, between Jamaica and Puerto Rico, even though associated with higher uncertainties, three cycles of activity advancing from W to E seem to take place at a mean rate of $6^{\circ}/\text{century}$.

Isolated series of more than two events with much higher migrating velocities, can be traced along well defined tectonic units with rates smaller than 300 Km/year; reversals of the migrating direction, of the type observed in the Anatolian fault between the periods 1904-1930 and 1930-1955, have not been found.

Acknowledgment is given to the Consejo Nacional de Investigaciones Científicas y Tecnológicas, CONICIT, whose funds made possible the collection of data for this paper.

(I) Associate Professor at the Instituto de Materiales y Modelos Estructurales, Facultad de Ingeniería, Universidad Central de Venezuela, Apartado 50361, Caracas, Venezuela.