SEISMOTECTONIC STUDY OF NORTHWEST KASHMIR

by

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SYNOPSIS

It is an usual practice to carry out detailed seismotectonic studies of seismically active region for earthquake resistant design of structures. In this paper, based upon the data on past earthquakes, probabilistic methods have been applied to determine the trend of seismic activity of the North West Kashmir region. Focal mechanism solutions of Sept. 3, 1972 (Magnitude = 6.2) event and its aftershocks sequence have been studied and a possible correlation with geologic features of the region has been attempted.

DISCUSSIONS

The high seismicity of the NW Kashmir is believed to be due to the underthrusting of the peninsular mass into the bordering Himalayan mountain, Krishnan (1953). Spatial distribution of shocks for the period 1902-1974 shows that earthquakes are distributed in approximately two restricted linear zones one NE-SW and other NW-SE. The junction of these two zones shows an intense seismic active area.

Using statistical method it has been seen that Gumbel's probability theory of largest value applied to earth-quake magnitude can best be used, for estimating the probability of occurrence of large earthquakes and corresponding return period may be used as a quantitative measure of seismicity.

Focal mechanism solutions of the earthquake of Sept. 3, 1972 (M = 6.2) event and its aftershocks sequence are in accordance with the model of convergence of two continental lithospheric plates (subduction) along the faults of thrust nature. The orientation of stress axes shows the P axes are horizontal and nearly parallel to the geologic tectonic trend. This shows the compressive deformation of the overriding plate and also indicates that the compressive force is responsible for all earthquake activity in this region.

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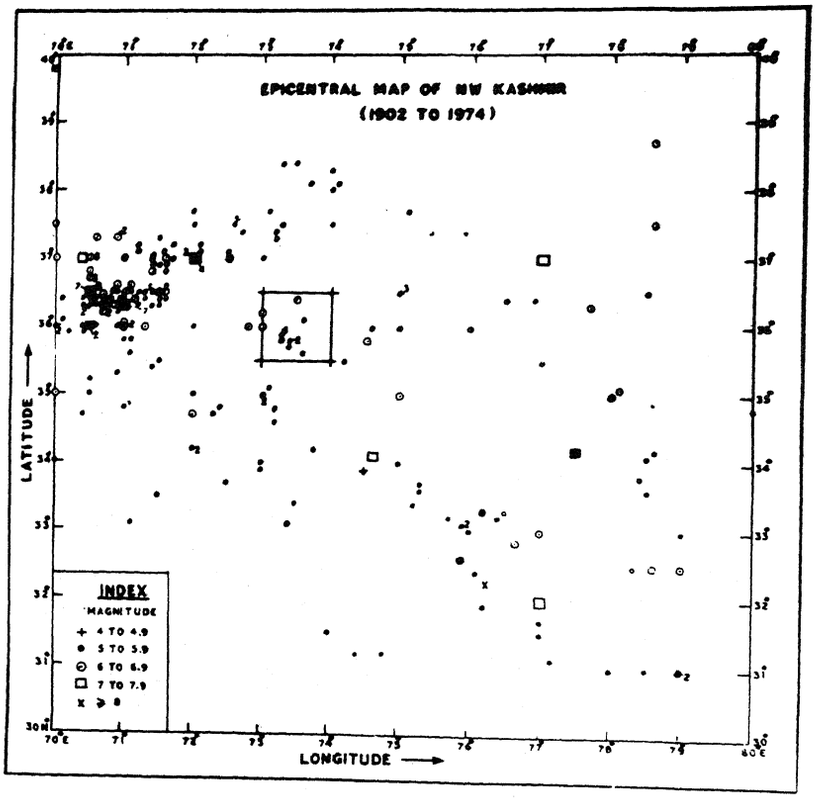

Fig. 1 : Epicentral map of NW Kashmir (1902 to 1974)

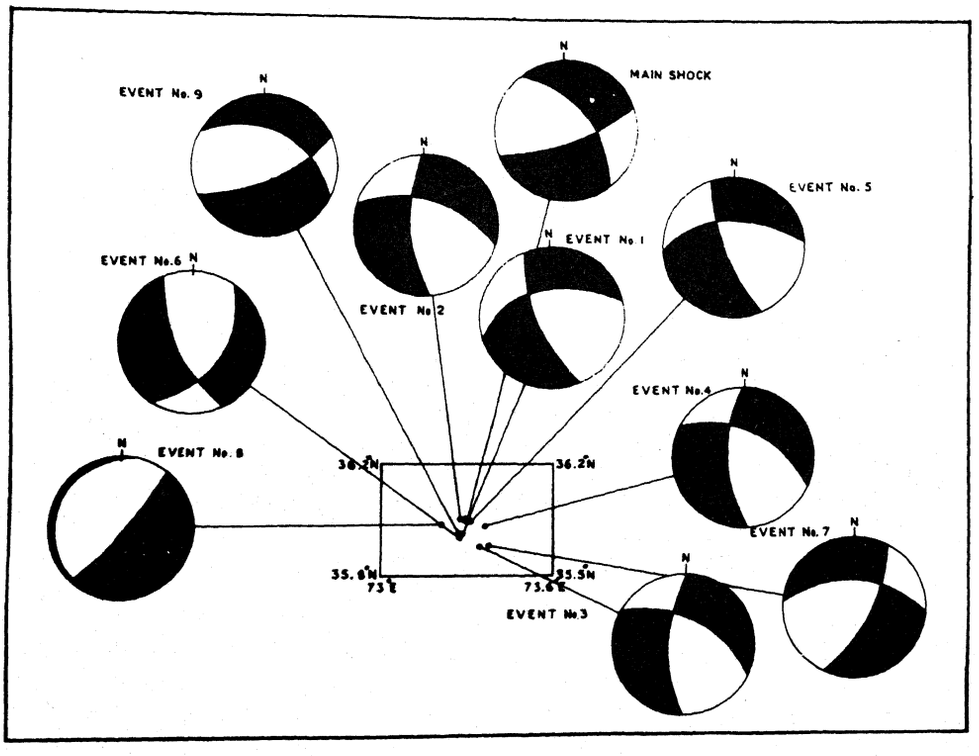

Fig. 2 : Focal-mechanism solutions of the Sept. 3, 1972, NW Kashmir and its 9 aftershocks. The schematic solutions are on equal area projection of the lower focal hemisphere.