THE JULY 9 AND 23, 1905, MONGOLIAN EARTHQUAKES: FURTHER COMMENTS

EMILE A. OKAL

Seismological Laboratory, California Institute of Technology, Pasadena, CA 91125 (U.S.A.)

Accepted June 19, 1978

I welcome Ilyin's [1] pertinent discussion of the geological features of the 1905 earthquakes, which I investigated on purely seismological grounds [2]. I would like, however, to discuss the apparent discrepancy on the subject of the focal mechanism of the July 9 event (event 1 [2]).

Comparison of the two events at the same stations, equipped with Milne low-gain seismometers, which remained on scale for event II, is usually compatible with similar focal mechanism, although a slightly inclined fault is certainly possible. This would not, anyway, have a significant effect on the seismic moments involved (see [2, table 3]). The extensive rupture (200 km) evident from the seismic investigation of event I clearly associates this earthquake with the Bolnai fault, in its hypocentral mechanism, whereas the surface breakage occurred only in an area somewhat to the north. Similar differences between hypocentral location, focal mechanism and surface faulting are commonly reported (e.g. [3]); a classic example involving large-scale strike-slip is the Alpine fault in New Zealand [4].

My attention was also recently drawn to various reports of the Mongolian earthquakes published around 1905–1907 by the Permanent Commission on Seismology of the Imperial Academy of Sciences. A first-motion dilatational arrival (to SW) is reported by Voznesenskii at Irkustk [5] for event I. Although the corresponding seismograms are not shown and the ability of the Galitzin instrument to record P-wave first-motion information might be questionable, this direction of motion would be compatible with left-lateral strike-slip along the Bolnai fault. The map of isoseismals included in Voznesenskii's paper is also clearly compatible with an extended rupture along the Bolnai fault.

References


1 Present address (as of August 1, 1978): Department of Geology and Geophysics, Yale University, Post Office Box 2161, New Haven, (CT) 06520, U.S.A.

Contribution Number 3064, Division of Geological and Planetary Sciences, California Institute of Technology.