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Geodynamics of the mud volcanic activity in connection with the preparation of earthquake focal zones

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Until the present time almost the only reliable data on the migration of mud activity volcanoes resulted from the case in which the several mud eruptions that occurred from 3 March 1980 to 7 December 1981 gradually migrated westward along line one of a large system of faults of the Caspian Sea-Main Caucasian seismic belt (O. Babazade, 1985, Proceeding of 23rd General Assembly of IASPEI, vol 1, Tokyo, Japan, p. 109). Along the westward portion of this belt the 1981 Shemakha-Ismailly earthquakes as well as the final mud eruptions occurred simultaneously and at the same location. The velocity of migration in these mud eruptions was estimated at about 230 km/year, very similar to the migration velocities of short-term precursors to strong earthquakes. Some remarkable migrations of eruptions of mud volcanoes are described based on the systematic analysis of the published data in the period 1810-2001 in and around the South-Caspian depression. Herein we present a new type of migration of mud eruptions which differs from ones that are the result of the propagation of activity along a fault, such as mentioned above, and is an instance in which it is thought that the migration of mud activity occurred through the migration of the deformation front. This new type of migration occurs due to activity across the deformation front (fault). In these cases a fairly clear tendency of movement of eruption lines in successive time intervals toward the future large earthquake is found. This pattern of migration is similar to that of the mud eruptions that have been observed in the NNW-SSE direction from the Kobystaun-Apsheron trough (east Azerbaijan) to a region of east central Iran since 1974. At the time of the great Tabas-E-Colshan (Iran) earthquake of Ms = 7.7 of September 16, 1978, this migratory pattern is discussed in particular detail. The other example of the second type of migrations in the form of front movement of mud volcanic eruptions towards the strongest Kras-

novodsk earthquake with M = 8,0 in 1895 in the period of preparation of its focal zone is given. The casual relationship between earthquakes and migration of the mud eruptions is not exactly clear. Nevertheless, it is highly likely that the discovery of migratory mud volcanoes before the earthquake can be considered as new precursory phenomena. There are provided the detailed results of revealing the ordered migration of the mud-volcanic eruption of two types by reconstructions of the preparatory phase of earthquakes on 25.11.2000 (M = 5,8; 6,3) and 06.12.2000 (Ì = 7,3), having respectively arisen in few kilometres to the southeast and northwest of Baku in the Caspian Sea and in the West Turkmenistan. In connection with the same migration, landslide phenomena at the Absheron Peninsula are also reviewed in these cases with respect to future earthquakes. These found phenomena may give an important clue to the understanding of processes in this region and may be used for constructing the earthquake preparing pattern and also as short and medium term precursors of their (earthquakes) prediction.