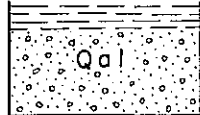
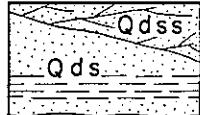
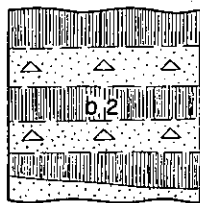
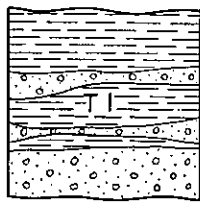
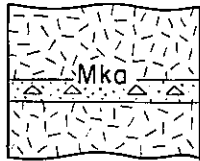
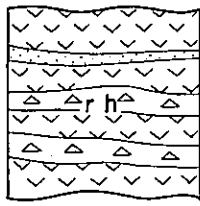
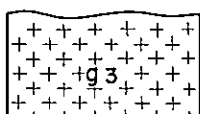
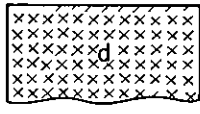
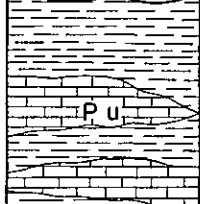
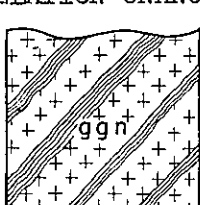
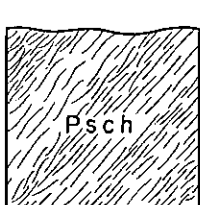


GEOLOGIC COLUMN AND UNIT DESCRIPTIONS

AGE	ROCK UNIT	LITHOLOGY; THICKNESS WHERE KNOWN	UNIT DESCRIPTION
QUATERNARY	Alluvium	 Sand, gravel and clay; thickness less than 10 meters	Alluvium, consisting of sand, gravel and clay of aeolian origin, is distributed in the river flats and playas.
	Diluvium	 Qds: dune sand, silt and clay; Qdss: sand dunes; thickness more than 50 m	Diluvium, consisting of dune sand, silt and clay, was deposited in fluvio-lacustrine basins of the Mongolian plateau during the Late Pleistocene, to be subsequently exposed and wind-eroded. Crescent-shaped drifting dunes are distributed in places.
TERTIARY	UNCONFORMITY		
	Neogene basalt	 Olivine-augite basalt, tuff and sand; thickness less than 200 m	The Neogene basalt forms a mesa on the northern side of the A-erh-shan Ho(阿爾善河). The rock is olivine-augite basalt, accompanied by tuff and sand, and is probably a detached remnant of the plateau basalt that covers Ta-hsing-an-ling (大興安嶺) Range in the adjacent map on the east (Ha-ma-ko-tsa sheet, NL 51-1). The basalt may have erupted during the Neogene epoch and covered the Mongolian peneplain which came into existence probably by the end of Paleogene time.
	EFFUSIVE CONTACT		
	Harahen formation	 Clay, sand, sandstone and conglomerate; thickness more than 100 m	The Harahen formation exposed along the Halha Gol consists, in descending succession, of white clay more than 15 m thick, alternating sand and clay 0.3 to 5 m thick, and soft sandstone and conglomerate of unknown thickness. Presumably the formation stretches broadly toward the northwest in the map area, although it largely lies under the cover of dune sand.
	UNCONFORMITY		
	Cretaceous andesite	 Quartz andesite and breccia; thickness unknown	The Cretaceous andesite, consisting chiefly of flows of quartz andesite and breccia, is exposed east of Ni-su-hun Shan(尼蘇山) on the north side of the Halha Gol. The age of eruption is believed to be later than the Cretaceous rhyolite (rh).
	EFFUSIVE CONTACT		
	Cretaceous rhyolite	 Rhyolite, trachyte, tuff and breccia; thickness less than 1,000 m	The Cretaceous rhyolite includes flows of rhyolite and trachyte, with tuff and breccia. It covers the main body of the Ta-hsing-an-ling Range east of the map area.
	EFFUSIVE CONTACT		
	Lower Cretaceous formation	 Arkose and tuff; thickness about 100 m	The Lower Cretaceous formation west of the K'uei-t'eng Ho(奎騰河) consists of arkose and tuff, generally striking N 50° E and dipping 25° NW and underlying the Cretaceous rhyolite.
	PROBABLE UNCONFORMITY		
	Cretaceous granite	 Biotite granite, granite porphyry and quartz porphyry	The Cretaceous granite consists chiefly of coarse biotite granite, accompanied by granite porphyry and quartz porphyry. Presumably it has a close relation to the eruption of the Cretaceous rhyolite.
	Cretaceous diorite	 Diorite	The Cretaceous diorite is an intrusive mass and may be a basic phase differentiated from the granite magma. It is exposed southeast of Handagai.
	INTRUSIVE CONTACT		
	Solun formation	 Slate, chert and limestone; thickness unknown	The Solun formation occupies low hills south of Ni-su-hun Shan on the northern bank of the Halha Gol. The formation consists chiefly of slate intercalated with chert and limestone lenses. The chert, exposed on the hills, is reddish and hard.
	RELATION UNKNOWN		
	Granite gneiss	 Biotite granite gneiss and migmatite gneiss	Granite gneiss consists chiefly of biotite granite gneiss associated with migmatite gneiss, and intrudes the crystalline schist (Psch).
	INTRUSIVE CONTACT		
	Crystalline schist	 Mica schist and hornfels	Crystalline schist includes mica schist and hornfels. It is distributed in the district south of Handagai. It may be a metamorphosed Paleozoic formation but the age has not been determined.
(Column not drawn to scale)			

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Hot spring

The hot spring of Haronarushan is located on the eastern bank of the Harubakanto-ka, a tributary of the Halha Gol. It is one of the most famous hot springs in Manchuria, and has been popular since the Chien-lung Era (1736-1795). Consisting of more than 40 baths, it ranges from 46°C to 30°C in temperature. The spring water, gushing out of fissures of rhyolite, is transparent, and has a faint odor of hydrogen sulphide. The spring may be genetically related to the post-volcanic activity of the Neogene basalt.