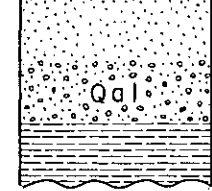
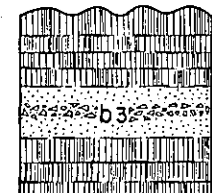
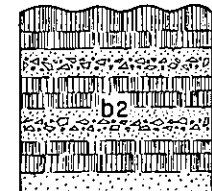
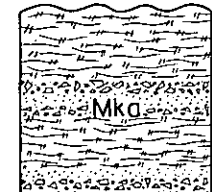
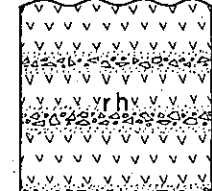
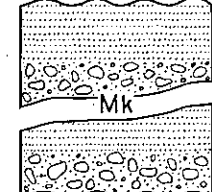
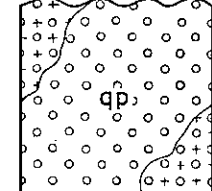
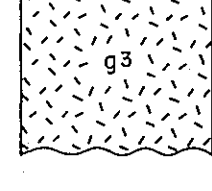
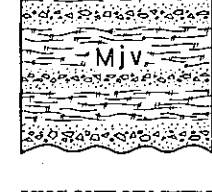
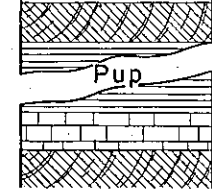


GEOLOGIC COLUMN AND UNIT DESCRIPTION

AGE	ROCK UNIT	LITHOLOGY; THICKNESS WHERE KNOWN	UNIT DESCRIPTION	REFERENCES
QUATERNARY	Alluvium	 Sand, gravel and clay; thickness less than 10 meters	Alluvium, consisting of sand, gravel, and clay, covers river flats and playas.	<p>HARAGUCHI, Kuman, and others, 1937, Geology and geography of north-western Manchuria: Geol. Inst., S. Manchuria Ry. Co.</p> <p>HATCHO, Torao, 1926, Geology and mineral resources along the route T'ao-nan - Cha-lai-no-erh - Manchou-li [洮南 - 扎赉诺尔 - 满洲里]: Unpub. rept., Geol. Inst., S. Manchuria Ry. Co.</p> <p>OZAKI, Hiroshi, 1938, Reconnaissance report on the route T'ao-nan - A-erh-shan [阿尔山]: Unpub. rept., Geol. Inst., S. Manchuria Ry. Co.</p> <p>SAITO, Rinji, Compiler, 1940, Geological map of Manchuria and adjacent areas, scale 1:3,000,000: Manchoukuo Geol. Inst.</p> <p>USHIMARU, Shutarō, and others, 1937, Geology and geography of northern Manchuria: Geol. Inst., S. Manchuria Ry. Co.</p>
	Quaternary basalt	 Olivine-augite basalt; thickness more than 50 m	The Quaternary basalt occurs as flows of amygdaloidal and compact olivine-augite basalt. It may have flowed out of volcanic craters in the Ta-hsing-an-ling Range during the Pleistocene epoch and covered the drainage basins of the A-erh-shan Ho [阿尔善河] in the west and the Ch'ai Ho [查伊河] in the east. Onē-nōru lake near the confluence of the Ch'o-erh Ho [赫尔河] and the Ch'ai Ho is probably a volcanic crater. The basalt thickness, where measured, is more than 50 m.	
TERTIARY	Neogene basalt	 Olivine-augite basalt, tuff and sand; thickness less than 200 m	The Neogene basalt consists of flows of olivine-augite basalt, accompanied by tuff and sand. The thickness ranges from 100 to 200 m. The rock is the margin of the plateau basalt of the Ta-hsing-an-ling Range, in the So-lun sheet (NL 51-4) adjacent on the south. It may have been erupted during the Neogene epoch and covered the Mongolian peneplain which is thought to have been formed by the end of the Paleogene epoch.	
	Andesite	 Quartz andesite and breccia; thickness less than 300 m	Andesite, consisting chiefly of quartz andesite and breccia, is exposed in the Kuang-ting Shan [光顶山] area along the Tsoen - Wenchun Railway and in the drainage basin of the I-min Ho [伊敏河]. The age of eruption is believed to be later than the rhyolite (rh). The thickness is less than 300 m.	
MESOZOIC	Rhyolite	 Rhyolite, trachyte, tuff and breccia; thickness less than 1,000 m	Rhyolite consists of flows of rhyolite and some trachyte, with tuff and breccia. It constitutes the body of the Ta-hsing-an-ling Range. The thickness is less than 1,000 m.	
	Cretaceous formation	 Tuffaceous sandstone, sandstone and conglomerate; thickness unknown	The Cretaceous formation, consisting of tuffaceous sandstone, sandstone, and conglomerate, is exposed 10 km northwest of Haruhata San. It generally strikes N-S and dips 10°- 30° E, showing a monoclinical structure.	
	Quartz porphyry	 Quartz porphyry and granite porphyry	Quartz porphyry, including granite porphyry, is believed to be a marginal facies of the Cretaceous granite (g ₃).	
	Cretaceous granite	 Biotite granite and quartz monzonite	The Cretaceous granite consists of coarse- to medium-grained biotite granite, locally associated with quartz monzonite, and occurs as stocks and laccoliths.	
	Jurassic volcanic complex	 Propylitic andesite, diabase porphyrite, breccia, and tuff; thickness unknown	The Jurassic volcanic complex consists chiefly of flows and sheets of propylitic andesite, diabase porphyrite and breccia, accompanied by their tuffs. The age of the igneous activity is possibly Early Jurassic. The thickness is unknown.	
PALEOZOIC	Solun formation	 Graywacke, siliceous slate, siliceous sandstone and crystalline limestone; thickness unknown	The Solun formation is a Carboniferous-Permian marine formation consisting of graywacke, siliceous slate, siliceous sandstone, and crystalline limestone. The formation constitutes the bedrock of the map area, and is covered by various volcanic rocks of Mesozoic age. No fossils have been reported. The thickness is unknown but is possibly very great.	
(Column not drawn to scale)				