GEOLOGIC COLUMN AND UNIT DESCRIPTION

AGE	ROCK UNIT	LITHOLOGY; THICKNESS WHERE KNOWN	UNIT DESCRIPTION
QUATERNARY	Alluvium	Qal — Sand, clay and gravel; thickness less than 10 meters.	Alluvium, consisting of sand, clay and gravel, covers lower terrace remnants and vast flood plains of such rivers as the Ch'i-li-hsing Ho[七里星河], the Nao-li Ho[拐力河], the Ch'i-hu-lin Ho[七虎林河] and the Ussuri River. Swamps are filled by fine sand and clay probably less than 10 m thick.
	Diluvium	Qd — Sand, clay and gravel; thickness unknown.	Diluvium consists of sand, clay and gravel, and covers somewhat elevated terraces fringing the above-mentioned flood plains. A cut bank 2 meters high along the river near Yen-erh-wo-chih[燕兒窩址], consists of gray or brownish clay, containing fragments of mammalian bones and fresh water shells including Unio and Viviparus. K. KAWADA tentatively named the clay bed the Yenerhwo bed and correlated it with the so-called Kuhsiangtun bed of the Harbin district.
	UNCONFORMITY		
TERTIARY	Neogene basalt	b2 — Flows of olivine basalt	The Neogene basalt occurs as flows of variable thickness, and is exposed mainly as caprock in the Wan-ta[宛達] Mountain Range south of Pao-ch'ing[寶清].
	EFFUSIVE CONTACT		
	Paleogene formation	Tl — Sandstone, shale and conglomerate; thickness less than 1,000 m	The Paleogene formation may be closely related to the Posyet series of the Southern Ussuri Region, and the Hunch'un series of the Hun-ch'un district in Manchuria. The thickness is probably less than 1,000 m.
	UNCONFORMITY		
MESOZOIC	Upper? Cretaceous volcanic complex	Mkv — Volcanic flows and agglomerate, with tuffaceous sandstone and shale; thickness unknown	The Upper? Cretaceous Volcanic complex is indicated on the Geologic Map of USSR. Presumably it is closely related to the so-called Tuffaceous Nikan of the Southern Ussuri Region which is associated with tuffaceous sandstone and shale. Thickness is not known.
	Rhyolite	rh — Flows and sheets of rhyolite, with dikes of quartz porphyry; thickness unknown	Flows and sheets of rhyolite with dikes of quartz porphyry are mainly distributed west of Pao-ch'ing.
	Andesite	a — Flows and breccia of augite andesite; thickness unknown	Augite andesite, occurring as flows or breccia, is mainly exposed as mesas. West of Kung-ssu[公司] it covers the so-called Kungssu formation or Jurassic formation.
	EFFUSIVE AND INTRUSIVE CONTACT		
	Jurassic formation (Kungssu formation)	Mj — Sandstone, shale, conglomerate, hornfels and coal; thickness unknown	The Jurassic formation on the Manchurian side of the Ussuri River corresponds to what was called the Kungssu formation[公司層] by K. KAWADA (1951). KAWADA tentatively included it in the Permo-Carboniferous Mammo formation[滿家層], but its lithologic characters indicate that the Kungssu formation is closely related to the Jurassic formation on the Soviet side. The formation consists of sandstone, shale and conglomerate, and is occasionally intercalated with hornfels. The sandstone contains poorly preserved fragments of plant fossils. The conglomerate consists of cobbles of reddish chert and grayish quartzite, both derived from the metamorphic rocks of the Tumuho formation[穆木河層]. The shale has locally been changed to hornfels due to igneous contact. The Jurassic formation in the Soviet territory has lately been divided into the Lower (J_3), Middle (J_2) and Upper (J_1), but no descriptions are available. A coal field occurs in the headwaters of the Hsiao-se-chin-pieh Ho[小色金別河], a tributary of the Nao-li Ho, about 30 km south of Pao-ch'ing. Coal was not worked due to difficult access.
	UNCONFORMITY		
	Pre-Jurassic granite	gz — Biotite granite and hornblende-biotite granite	The pre-Jurassic granite intrudes the Upper Paleozoic formation and has affected it by contact metamorphism.
	INTRUSIVE CONTACT		
PALEOZOIC	Upper Paleozoic formation	Pu — Quartzite, graywacke, sandstone, slate and chert; thickness unknown	The Upper Paleozoic formation corresponds to the Tumuho formation (K. KAWADA, 1951). It consists chiefly of thick quartzite and graywacke, intercalated with thin sandstone, slate, and chert. The quartzite and graywacke are grayish, compact and cleavable. The chert is purplish and marked with networks of vein quartz, and contains radiolarian fossils. The formation is correlatable with the Permo-Carboniferous marine formation of the Khavalofsk district.
	PROBABLE UNCONFORMITY		
PRECAMBRIAN?	Granite gneiss	gn — Granite gneiss and migmatite gneiss	Granite gneiss and migmatite gneiss constitute low hills around Yao-ying Shan[腰營山] on the west bank of the Ussuri River. The granite gneiss forming Gora Sokolikha in the Russian territory beyond the river is assigned to Archean in the Geological Map of U.S.S.R. (1955).

(Column not drawn to scale)

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