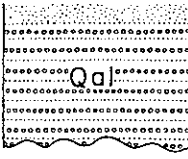
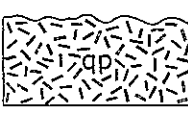
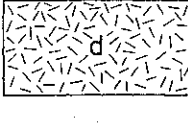
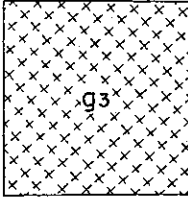

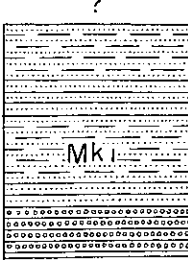
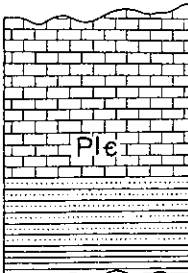
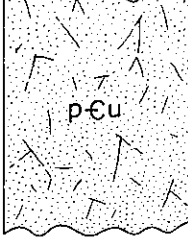

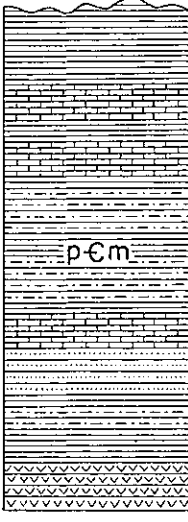
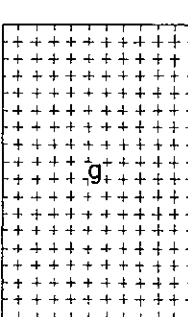


AGE	ROCK UNIT	LITHOLOGY; THICKNESS WHERE KNOWN	REMARKS
CENOZOIC	Alluvium	 Alluvial deposits of gravel, sand, and clay, 2-10m thick	ALLUVIAL DEPOSITS. Essentially composed of gravels, sands, and clays of various kinds. Occurs everywhere along rivers and the sea coast.
	Unconformity		
MESOZOIC		 Quartz porphyry	QUARTZ PORPHYRY. Grayish brown, contains phenocrysts of quartz and feldspar in a felsic groundmass; intruded into the AGGLOMERATIC TUFF (Mk ₂).
		 Diorite and porphyrite	DIORITE and PORPHYRITE. Possibly are two textural varieties of the same rock; consist of zoned feldspar, hornblende, and interstitial quartz; probably tonalites. Occur as dikes in the GNEISS (ggn), GRANITE (g) and AGGLOMERATIC TUFF (Mk ₂).
	Cretaceous	 Granite porphyry	GRANITE PORPHYRY. This brown rock contains large phenocrysts of pink orthoclase and smaller ones of bipyramidal quartz in a fine-grained granitic groundmass. The granite porphyry west of Ta-ku-shan (大孤山) is intruded into the AGGLOMERATIC TUFF (Mk ₂).
		 Feldspar porphyry and agglomeratic tuff	FELDSPAR PORPHYRY and AGGLOMERATIC TUFF. These rocks occur widely west of Ta-ku-shan. The FELDSPAR PORPHYRY is dark purple, has phenocrysts of orthoclase, and is associated intimately with the AGGLOMERATIC TUFF. A similar rock group, associated with red tuffaceous sandstone, shale, and conglomerate, occurs near Chuang-ho (莊河) in the Fu-hsien (復縣) sheet, west of and adjacent to this sheet. The two are assigned the same age, and possibly correlated with the SHIRAGI SERIES (Cretaceous) along the Yalu River.
	Cretaceous-Jurassic	 Sandstone and shale, interbedded with conglomerate, agglomerate and black shale, approximate thickness 1,000m or more	SHALE, SANDSTONE, and CONGLOMERATE. The formation consists chiefly of alternating beds of green sandstone and green or brown shale, and is interbedded with conglomerate, agglomerate, and black shale. No identifiable fossils can be found other than fragmental plant fossils, but these beds can undoubtedly be correlated with the Rakito Series (Lower Cretaceous - Upper Jurassic) near Simuju (新集州) on the southern bank of the Yalu River.
Unconformity			
PALEOZOIC	Cambrian?	 Black limestone in the upper part, alternation of siliceous sandstone and calcareous shale in the lower part, approximate thickness 150m or more	BLACK LIMESTONE, SHALE, and SANDSTONE. The BLACK LIMESTONE, overlying the QUARTZITE group (p _{6u}), is distributed through a small area along the western coast, and dips generally seaward. The basal part of the formation consists of alternating beds of siliceous sandstone and calcareous shale. Although they contain no fossils, these beds are considered to be Lower Cambrian on the basis of lithology.
Unconformity?			
PRE-CAMBRIAN	Sinian system	 Quartzite, approximately 150-200m thick, and 100-150m at Ta-ku-shan	QUARTZITE. The QUARTZITE is a fine- to medium-grained, white to pink quartzite, 100 to 150 m thick at Ta-ku-shan; found mostly in association with the CRYSTALLINE SCHISTS (p _{6m}) as if the two were conformable. A part of the QUARTZITE, however, near Wang-chia-tien (王家店), about 8 km northwest of Chi-wo-p'u (柴窩堡), contains an apparent basal conglomerate and rests directly upon the GNEISS COMPLEX. Because the GNEISS COMPLEX is thought to be younger than the CRYSTALLINE SCHISTS, the QUARTZITE is considered unconformable with the CRYSTALLINE SCHISTS.
	Unconformity		
	Pre-Sinian	 Granite gneiss and migmatite gneiss	GRANITE GNEISS and MIGMATITE GNEISS. This GNEISS COMPLEX is composed of biotite gneiss, hornblende-biotite gneiss, and hornblende gneiss, in association with crystalline schists. The latter includes crystalline limestone, talc schist, and mica schist, all of which are believed to be derived from the LIAO-HO SYSTEM (p _{6m}). Most of the gneisses have been regarded as orthogneiss, mainly granite gneiss; although some of those found in the region where crystalline schists occur have been ascertained to be paragneiss, particularly those south of Ta-ting Shan (塔子山) and east of Ch'ian-lung Shan (前龍山). The greatest part of the gneiss area, however, may be composed of composite gneiss or migmatite gneiss in addition to the granite gneiss.
INTRUSIVE CONTACT			
	Liaoho System	 Crystalline schists, chiefly of phyllite and phyllitic slate, more than 1,500m thick	CRYSTALLINE SCHISTS. The CRYSTALLINE SCHISTS consist chiefly of phyllite and phyllitic slate containing bluish-gray quartzite and some limestone layers. These rocks are overlain unconformably (see above) by the QUARTZITE group (p _{6u}), but their base has never been recognized. They commonly grade into mica schist and, locally, into mica gneiss. Judging from the lithologic character of the entire formation it should be correlated with the upper part (KAI-PING SERIES) of the Middle pre-Cambrian (LIAO-HO SYSTEM) which is typically developed near Kai-ping on the railroad between Shen-yang (瀋陽) and Ta-lien (大連).
AGE UNKNOWN		 Granites of unknown age, biotite granite predominates, followed by two-mica granite and hornblende-biotite granite (Column not drawn to scale)	GRANITE. The granites mapped in this sheet are classified, according to their principal ferromagnesian constituents, into three kinds, biotite granite, two-mica granite, and hornblende-biotite granite. Of these, the biotite granite is most predominant and comprises two textural varieties, a "porphyritic granite" containing large phenocrysts of pink or white orthoclase, and a "fine- to medium-grained biotite granite". All granites heretofore have been referred to the pre-Cambrian. However, some of the granites are younger than the Sinian (p _{6u}), although no conclusive evidence has been reported from this region. The biotite granite and the two-mica granite are commonly schistose, grading not only into one another but also into the GRANITE GNEISS (ggn), and may be assigned to the pre-Sinian intrusion (g ₁) or the equivalent of the GRANITE GNEISS. Both granites are grayish white, commonly fine-grained, and consist of quartz, orthoclase, plagioclase, and biotite with or without muscovite. A muscovite-bearing variety is predominant in the northwestern region including Ch'ian-lung Shan and its northern mountains. The "porphyritic granite" occurs along the country road from Ta-ku-shan westward to Chuan-ho, and in places passes gradually into medium- or coarse-grained granite. The boundaries between the "porphyritic granite" and the CRYSTALLINE SCHISTS (p _{6m}) or GNEISS COMPLEX (ggn) are commonly distinct. The "porphyritic granite", however, is more or less schistose along the contact with the CRYSTALLINE SCHISTS. It is doubtful that there is any connection between the "porphyritic granite" and the GRANITE PORPHYRY (g ₃). The latter contains large orthoclase phenocrysts and is intruded into the Sinian QUARTZITE near the sea coast south of the "porphyritic granite" body. For these reasons the "porphyritic granite" may probably be regarded as a post-Sinian intrusion. Further, the relation between the GRANITE PORPHYRY (g ₃) and the AGGLOMERATIC TUFF (Mk ₂), west of Ta-ku-shan, suggests that the GRANITE PORPHYRY (g ₃) may be of post-Jurassic age. The hornblende-biotite granite is a gray, medium-grained granite occurring in a limited area along the Ta-yang Ho (大洋河). A part of this granite is intruded into the CRYSTALLINE SCHIST near Hsiao-huang-chi (小黃旗), southwest of Ta-ting Shan, and accompanied by manganese veins consisting of psilomelane, pyrolusite, and quartz. Such granite as this may be of a relatively young age, but there is no stratigraphic evidence for this.