

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating Fossil	Pollen	Remarks
						Rock	Ore				
73	2-d	Tacaza	Trachyte	○							
74	"	"	Trachybasalt	○		○		○			
75	"	"	"	○		○					
76	"	"	Olivine basalt	○							
77	"	"	Basalt								
78	"	"	Trachybasalt								
79	2-e	"	Trachyte	○		○			○		
80	"	"	"								
81	"	"	Trachyte								
82	"	"	Trachyandesite								
83	"	"	Trachyte	○		○					
84	2-f	"	Basalt								
85	"	"	Tuff breccia								
86	2-g	Sencca	Lapilli tuff								
87	"	Tacaza	Porphyritic trachyte	○		○			○		
88	"	Sencca	Trachyte (tuff breccia)								
89	"	"	Trachytic tuff breccia								
90	"	Tacaza	Porphyritic trachyte								
91	"	"	"	○							
92	"	"	"								
93	"	"	Basalt								
94	"	"	Trachytic tuff breccia								
95	"	"	Andesite								
96	"	Descanso	Rhyolitic pumice-tuff	○							

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
97	3-a	Intrusives	Altered microgranite	○								
98	"	Tacaza	Altered dacite									
99	3-b	Seneca	Dacitic tuff breccia									
100	"	Barroso	Basaltic andesite									
101	3-c	Tacaza	Trachyandesite	○		○						
102	"	Seneca	Rhyolitic pitchstone	○								
103	"	"	Dacitic lapilli tuff									
104	"	Barroso	Andesite	○								
105	3-d	"	Basaltic andesite									
106	3-c	Tacaza	Andesite									
107	"	"	Basalt	○								
108	"	"	Trachybasalt									
109	"	"	Porphyritic trachyte									
110	"	"	Trachybasalt									
111	3-f	"	Porphyritic trachyte									
112	4-a	Seneca	Tuff breccia									
113	"	Tacaza	Altered basalt	○								
114	4-b	Seneca	Rhyolitic tuff	○								
115	"	"	"	○								
116	"	Tacaza	Altered basalt									
117	4-c	Ferrobamba	Recrystallized limestone									
118	"	"	Sandstone									
119	"	Tacaza	Trachybasalt	○								
120	"	Seneca ?	Trachyte	○								

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
121	4-c	Tacaza	Basaltic andesite									
122	"	Barroso	"									
123	"	Tacaza	Trachybasalt									
124	4-d	"	Pumice-tuff									
125	"	"	Trachy andesite	○			○					
126	"	Tacaza ?	Rhyolite (welded tuff ?)	○								
127	"	Tacaza	Porphyritic basalt	○								
128	"	"	Altered olivine basalt									
129	"	"	Porphyritic basalt									
130	4-e	Descanso	Tuff breccia									
131	"	Tacaza	Basaltic andesite									
132	"	Descanso	Pumice-tuff									
133	"	"	"									
134	4-f	Tacaza	Basaltic andesite									
135	"	"	Basalt									
136	"	Coporaque	Sandstone	○								
137	4-g	Seneca	Rhyolite (tuff ?)									
138	5-a	Barroso	Basaltic andesite									
139	"	Seneca	Porphyritic trachyte									
140	"	"	Dacite									
141	"	"	Andesitic tuff breccia									
142	"	"	Rhyolite	○			○					
143	5-b	"	Tuff									
144	"	"	"									

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
145	S-b	Seneca	Welded tuff									
146	"	"	Porphyritic trachyte									
147	"	"	"									
148	"	"	Trachyandesite									
149	"	Barroso	Basaltic andesite									
150	S-c	Seneca	Porphyritic trachyte									
151	"	"	Trachyandesite									
152	"	"	"									
153	"	"	Lepilli tuff									
154	"	Tacaza	Andesitic tuff breccia									
155	"	Barroso	Basalt	○								
156	"	Seneca	Porphyritic trachyte									
157	S-d	Tacaza	Agglomerate									
158	"	Barroso ?	Tuff breccia									
159	"	Barroso	Andesite	○								
160	"	Seneca	Altered trachyandesite	○								
161	"	Tacaza	Porphyritic andesite									
162	"	Seneca	Altered olivine basalt									
163	S-e	Tacaza	Altered basalt	○								
164	"	Seneca	Rayolitic tuff									
165	"	"	Olivine basalt	○								
166	"	"	Liparite									

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
167	S-c	Tacaza	Trachybasalt									
168	"	Sencca	Rhyolitic tuff	○								
169	S-f	Tacaza	Altered andesite	○								
170	"	Sencca	Dacitic tuff breccia	○								
171	"	Intrusives	Granite	○								
172	"	"	Granodiorite	○								
173	"	Coporaque	Sandstone	○								
174	"	"	"	○								
175	"	"	"									
176	"	"	Mineralized sandstone									
177	S-x	Descanso	Volcanic ash									
178	"	"	Sandy tuff									
179	"	Tacaza	Prophyritized volcanics									
180	"	"	Trachybasalt									
181	"	"	Prophyritized volcanics									
182	"	Intrusives	Granodiorite	○								
183	"	"	Calcite-quartz vein in granodiorite									
184	"	Descanso	Dacitic tuff									
185	6-a	Barroso	Basaltic andesite									
186	"	Sencca	Tuff									
187	"	Tacaza	Tuff breccia									
188	"	Sencca	Lapilli tuff									
189	"	"	Porphyritic trachyte									
190	"	"	"									

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
191	6-a	Barroso	Andesite									
192	6-b	Tacaza	"									
193	"	Barroso	Basaltic andesite									
194	"	Tacaza	Andesite agglomerate									
195	"	"	Trachyandesite									
196	"	"	"									
197	"	"	Basaltic andesite									
198	"	"	"									
199	"	Barroso	"									
200	"	"	Andesite	○								
201	"	Seneca	Basaltic andesite									
202	"	Tacaza	Porphyritic andesite									
203	"	"	Trachy andesite	○								
204	"	Seneca	Tuff breccia									
205	"	"	Tuff									
206	6-c	"	Dacite									
207	"	Tacaza	Trachybasalt									
208	"	"	Andesite									
209	"	"	Basaltic tuff									
210	"	"	Tuffaceous siltstone									
211	"	Seneca	Rhyolite									
212	"	Tacaza	Andesite									
213	"	"	"									
214	6-d	Seneca	Trachyandesite									

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
215	6-d	Barroso	Andesite	○								
216	"	"	"									
217	"	Tacaza	Altered andesite	○								
218	"	Sencca	Altered rhyolite	○								
219	"	Tacaza	Porphyritic basalt									
220	"	"	Trachybasalt									
221	"	"	Tuff breccia	○								
222	"	Sencca	Rhyolite welded tuff	○								
223	6-e	Tacaza	Trachybasalt									
224	"	Sencca	Porphyritic liparite									
225	"	"	Jasper vein in propylitized volcanics									
226	"	"	Basalt dyke									
227	"	"	Rhyolite (welded tuff ?)									
228	6-f	Tacaza	Altered basalt									
229	"	Sencca	Lapilli tuff									
230	"	Tacaza	Porphyritic basalt									
231	"	"	Altered basalt									
232	7-a	Barroso	Basaltic andesite									
233	"	Tacaza	Basalt									
234	"	Barroso	"									
235	"	"	"									
236	"	Tacaza	Trachyandesite									
237	"	"	Liparite dyke									
238	"	Barroso	Basaltic andesite									

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
239	7-b	Seneca	Trachyandesite	○								
240	"	"	Dacite	○								
241	7-b	Tacaza	Basalt									
242	"	"	"									
243	"	"	Trachyandesite	○			○					
244	"	Seneca	Porphyritic trachyte									
245	"	Tacaza	Basalt									
246	"	Seneca	Porphyritic trachyte	○			○					
247	"	"	Dacitic tuff									
248	"	"	"	○								
249	"	"	Tuff	○								
250	7-c	Tacaza	Andesitic tuff									
251	"	"	Tuffaceous sandstone									
252	"	"	Siltstone									
253	"	Seneca	Dacite	○			○		○			
254	"	"	Pumice-tuff									
255	"	"	Andesite ?									
256	"	"	Dacitic tuff									
257	"	"	Dacite	○								
258	"	Barroso	Andesite									
259	"	"	Altered andesite									
260	"	Seneca	Porphyritic trachyte									
261	"	Tacaza	White tuff									
262	7-d	"	Lapilli tuff									



Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
263	7-d	Tacaza	Basalt									
264	"	Seneca	Pumice-tuff									
265	"	"	Trachyandesite									
266	"	Tacaza	Basalt									
267	"	"	Altered basalt									
268	"	Seneca	Tuff breccia	○								
269	"	Tacaza	Trachybasalt									
270	"	"	"									
271	"	"	Trachyandesite									
272	7-e	Barroso	Olivine basalt	○								
273	"	"	Olivine basalt	○								
274	"	"	Pumice-tuff	○								
275	"	"	Andesite	○								
276	7-f	Tacaza	Basalt	○								
277	7-g	Seneca ?	Rhyolite with Ag-quartz vein				○					
278	"	Seneca	Tuff	○								
279	"	"	Rhyolitic tuff									
280	"	Descanso	Massive tuff	○					○			
281	"	Tacaza	Basalt	○			○					
282	"	"	"									
283	"	"	Scoriatic basalt	○								
284	"	"	Olivine basalt	○								
285	"	"	Altered basalt	○								
286	"	Barroso	Andesite	○								

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
287	1-g	Tacaza	Trachy andesite	○		○		○				
288	1-h	"	Altered scoria									
289	"	"	Trachyte			○						
290	"	"	Lapilli tuff									
291	"	"	Trachyte									
292	"	"	Lapilli tuff									
293	"	"	Trachy andesite			○						
294	"	"	Porphyritic trachyte									
295	"	"	"									
296	"	"	Altered basalt	○		○						
297	"	"	Andesitic tuff									
298	"	"	Trachyte									
299	"	"	Porphyritic trachyte									
300	"	"	Andesite									
301	"	"	Porphyritic trachyte									
302	"	"	"	○		○						
303	1-1	Yauri	Lignite									
304	"	"	Calcarenite									
305	"	Puno	Calcareous sandstone									
306	"	Descanso	Calcarenite			○						
307	"	Puno	Shale									
308	"	"	Obsidian									
309	1-j	"	Sandstone									
310	"	"	Lapilli tuff									

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
311	1-j	Puno	Sandstone									
312	"	"	Tuffaceous sandstone									
313	"	"	Conglomerate					○				
314	"	"	Sandstone									
315	"	"	"									
316	1-k	"	Sandstone	○								
317	"	"	Tuffaceous sandstone	○								
318	1-m	Ayabacas	Limestone							○		
319	"	"	"							○		
320	"	"	"							○		
321	"	"	"							○		
322	"	"	"							○		
323	"	Intrusives	Granite									
324	"	"	Granite porphyry									
325	1-n	Munani ?	Hornfels									
326	"	Intrusives	Granite porphyry									
327	"	"	"									
328	2-b	Tacaza	Trachy andesite	○								
329	"	"	Scoria									
330	"	"	Altered basalt									
331	"	Seneca	Dacite									
332	"	"	Tuff breccia	○								
333	"	Descanso	Tuffaceous sandstone									
334	"	"	Lapilli tuff									

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
335	2-1	Tacaza	Sandstone									
336	"	"	Basalt									
337	"	Descanso	Sandy tuff									
338	"	Puno	Sandstone	○						○		
339	"	Descanso	"									
340	2-k	Puno	Conglomerate									
341	2-1	Tacaza	Olivine basalt	○					○			
342	"	"	Trachy andesite	○								
343	2-m	Puno	Conglomerate									
344	3-h	Tacaza	Basalt	○								
345	"	Sencca	Tuff									
346	"	Tacaza	Lapilli tuff									
347	"	"	Trachyte									
348	"	Intrusives	Monzonite									
349	"	"	Diorite	○					○			Pyritization
350	"	"	Granodiorite	○								
351	"	"	Microdiorite		○							
352	"	"	Porphyrite									
353	"	"	Microdiorite									
354	"	"	Diorite porphyrite	○								
355	"	"	Granodiorite	○								
356	"	"	Diorite									
357	"	"	Meta-diorite porphyrite									
358	"	"	"	○								Pyrite vein

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating Fossil	Pollen	Remarks
						Rock	Ore				
359	3-b	Intrusives	Meta porphyrite								
360	"	"	Porphyrite with evaporite								
361	"	"	Diorite with magnetite		○						
362	"	"	Meta diorite porphyrite								
363	3-1	"	Biotite monzonite	○							
364	"	Descanso	Pumice-tuff	○							
365	"	"	Andesitic tuff								
366	"	"	Lapilli tuff								
367	"	"	Sandstone								
368	"	"	Tuff								
369	"	"	White tuff								
370	3-j	"	Sandstone								
371	"	Puno	Tuffaceous and silty sandstone								
372	"	Yauri	Tuff								
373	3-m	Tacaza	Basalt								
374	"	Puno	Tuffaceous sandstone	○							
375	"	Tacaza	Volcanic breccia	○							
376	4-h	Intrusives	Granodiorite	○					○		
377	"	Sencca	Dacite	○							
378	"	Tacaza	Olivine basalt								
379	"	Tacaza ?	Dacitic lapilli tuff								
380	"	Descanso	White tuff								
381	"	"	Conglomerate								
382	4-i	Yauri	Lapilli tuff								

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
383	4-1	Descanso	Lapilli tuff									
384	"	Yauri	Calcarenite									
385	"	Descanso	Tuffaceous sandstone									
386	4-7	Yauri	Calcarenite							○		
387	"	"	"									
388	"	"	Pumice-tuff									
389	4-k	Descanso	Dacitic tuff	○								
390	4-1	Ayabacas	Limestone	○								
391	"	Tacaza	Andesitic tuff breccia									
392	"	"	Lapilli tuff									
393	4-m	"	Porphyritic andesite									
394	"	"	Trachy andesite	○								
395	5-1	Descanso	Sandy tuff	○							○	
396	5-m	Puno	Liparite									
397	"	Ayabacas	Limestone							○		
398	"	"	"							○		
399	"	"	"							○		
400	"	Tacaza	Andesite	○								
401	"	Puno	Conglomerate	○								
402	"	Ayabacas	Dolomitic limestone	○								
403	"	Puno	Sandstone									
404	5-n	Tacaza	Altered andesite									
405	"	"	Andesite breccia									
406	"	Ayabacas	Dolomitic limestone	○								

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
407	6-h	Ferrobamba	Limestone									
408	"	Tacaza	Tuff breccia									
409	"	"	Pumice tuff									
410	"	"	Olivine basalt									
411	"	Yura	Quartzite									
412	"	"	"									
413	"	Ferrobamba	Altered limestone									
414	6-1	"	Limestone				○					
415	"	"	"				○					
416	"	Intrusives	Granodiorite	○								
417	"	"	Gabbroic diorite	○								
418	"	"	Quartz monzonite porphyry	○								
419	"	"	Granodiorite	○								
420	"	"	"	○								
421	6-j	Ferrobamba	Magnetite skarn									
422	"	Intrusives	Quartz monzonite porphyry	○								
423	"	"	Monzonite porphyry	○								
424	"	"	Quartz monzonite	○								
425	"	Ferrobamba	Garnet skarn	○								
426	"	Intrusives	Granodiorite	○								
427	"	Yura	Quartzite									
428	"	"	Black shale									
429	"	Intrusives	Porphyritic diorite	○								
430	"	"	Monzonite porphyry	○								

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
431	6-j	Intrusives	Granodiorite	○				○				
432	6-k	Yauri	Lapilli tuff									
433	"	"	Siltstone							○		
434	"	Ferrobamba	Limestone							○		
435	"	Yauri	Sandstone							○		
436	6-m	Tacaza	Lapilli tuff	○								
437	"	Puno	Liparite	○								
438	7-h	Tacaza	Dacite	○								
439	"	"	Tuff breccia									
440	"	"	Basalt									
441	"	"	Olivine basalt	○								
442	"	"	Basalt	○								
443	"	Sencca	Dacite	○								
444	"	Barroso	Altered andesite									
445	7-i	Intrusives	Porphyry									
446	"	Tacaza	Basalt	○								
447	"	"	Olivine basalt									
448	"	"	Basalt	○								
449	"	Yauri	Calcarene									
450	"	Ferrobamba	Limestone									
451	7-j	Intrusives	Quartz monzonite porphyry	○								
452	"	"	Granite porphyry									
453	"	"	Quartz monzonite porphyry with ore		○							
"	"	"	Monzonite with copper ore		○							Drill hole of Quechua No. 1-hole 73.00 m No. 2-hole 76.25 m



Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
453	7-j	Intrusives	Quartz monzonite porphyry with ore		○							No. 3-hole 37.80 m
"	"	"	Copper ore		○							No. 5-hole 74.00 m
" 1	"	"	Quartz monzonite porphyry	○								No. 3-hole 138.80 m
" 2	"	"	Porphyritic monzonite	○								No. 1-hole 251.58 m
" 3	"	"	Quartz monzonite porphyry	○								No. 1-hole 56.62 m
" 4	"	"	Monzonite porphyry	○								No. 2-hole 78.55 m
" 5	"	"	Quartz monzonite porphyry	○								No. 2-hole 78.55 m
" 6	"	"	Monzonite	○		○		○				No. 1-hole 10m-30m
" 7	"	"	Porphyritic monzonite	○		○		○				No. 1-hole 161m-176m
454	"	"	Monzonite ? with copper ore				○					
455	7-k	"	Gabbro	○								
456	"	Yauri	Rhyolite tuff									
457	"	Ferrobamba	Limestone									
458	"	Intrusives	Gabbroic diorite									
459	"	"	Monzonite porphyry	○								
460	"	"	Diorite									
461	"	"	Granodiorite	○								
462	"	Ferrobamba	Limestone									
463	7-l	Yura	Quartzite									
464	7-n	Puno	Rhyolite	○								
465	"	"	Sandstone									
466	"	"	Tuffaceous sandstone	○								
467	"	Tacaza	Volcanic breccia									
468	7-k	Intrusives	Porphyritic monzonite	○								

Sample No.	Location	Formation	Rock	Thin section	Polished section	Chemical analysis		X-ray analysis	Dating	Fossil	Pollen	Remarks
						Rock	Ore					
469	7-1	Intrusives	Monzonite porphyry	○								
"	"	"	Quartz monzonite porphyry	○								
"	"	Ferrobamba	Copper ore in limestone	○	○							

Table I-8 Microscopic Observations

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
1	1-a	Intrusives	Hornblende-biotite granodiorite	The rock is hypidiomorphic and composed of plagioclase, quartz, potash feldspar, biotite and hornblende (partly altered to chlorite) with accessory iron ore, apatite and sphene.	
4	1-b	Intrusives	Granodiorite	The rock is hypidiomorphic and composed mainly of plagioclase, potash feldspar, quartz and hornblende with accessory iron ore and apatite. Feldspars are partly altered to sericite. Carbonates and chlorite. Veinlets of carbonates filling the fine cracks are observed.	See Table I-10
5	1-b	Intrusives	Altered hornblende granite	The rock is hypidiomorphic and mainly composed of plagioclase, potash feldspar, quartz and hornblende with accessory iron ore, apatite and sphene. Plagioclase and potash feldspar are partly altered to sericite and/or carbonates. Some crystals of plagioclase are replaced by epidote.	
6	1-b	Seneca	Dacitic and welded tuff breccia	Crystal fragments (up to 3mm in size) of biotite and plagioclase and lithic fragments (up to 5mm) of basalt are in a argillaceous and partly spherulitic matrix. Crystal fragments are corroded.	
9	1-b	Intrusives	Hornblende-biotite quartz diorite	The rock shows a medium-grained and hypidiomorphic texture. The main constituent minerals are plagioclase (subhedral, up to 3mm, zoned, mainly andesite but having the core of labradorite or bytownite in the comparatively large crystals), quartz (anhedral, up to 2mm, often showing the wavy extinction), hornblende (sub-hedral columnar, up to 2mm, with a pleochroism of Z=yellowish brown, Y=yellowish green, X=pale brownish green) and biotite (sub-hedral to anhedral, up to 1.5mm, with a pleochroism of Z and Y=dark brown, X=brown to pale brown). The minor or accessory minerals are potash feldspar (anhedral, occurring as the interstices), clinopyroxene (observed in the core of hornblende crystals without exception), apatite, iron ore (magnetite and hematite), sphene, chlorite, epidote and sericite.	See Table I-10
12	1-c	Murco	Slate shale	The rock shows the phyllitic texture and is composed of sericite, quartz, plagioclase (albite to oligoclase), potash feldspar, altered augite (relicts) and opaque minerals. The grain size is less than 0.2mm in diameter. The rock is considered to be affected by some weak metamorphism.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
14	1-c	Intrusives	Augite-hornblende granodiorite	The rock is equigranular and composed of plagioclase (andesine), perash feldspar, green hornblende and augite with accessory epidote, sphene and apatite. Feldspars are partly altered to sericite-	
15	1-c	Murco	Saite	Angular to subangular crystal grains (up to 0.2mm in size) of quartz, feldspar, sericite and iron ore are cemented by argil- laceous matters. The rock is well sorted.	
22	1-d	Tacaza	Biotite-hornblende trachyte	Phenocrysts of biotite, hornblende (both are replaced by opaque minerals), plagioclase (andesine, up to 2mm) and sanidine are in a fine-grained and interstitial groundmass of plagioclase (andesine, lath-shaped), anorthoclase, augite, iron ore, apatite and glass. The groundmass shows the flow structure. Plagioclase laths are thinly mantled by anorthoclase. Cristobalite is formed in the drusy cavities.	See Table I-10
23	1-d	Tacaza	Rhyolitic tuff breccia	Corroded crystals of biotite, quartz and plagioclase are in a spherulitic and argillized matrix.	
24	1-d	Tacaza	Biotite trachyte	Phenocrysts of biotite (euhedral prismatic, up to 0.5mm, with a pleochroism of pale greenish brown to dark brown), plagioclase (euhedral columnar, up to 3mm long, distinctly zoned, twinned after albite and Carlsbad law) and sanidine (up to 3mm long) are in a fine-grained, argillaceous and partly spherulitic groundmass.	
25	1-d	Tacaza	Biotite trachyte	Phenocrysts of brown biotite (corroded, up to 3mm, including apatite and magnetite), plagioclase (up to 4mm, andesine, zoned, twinned after albite and Carlsbad law, mantled by anorthoclase) and sanidine are in a medium-grained and trachytic groundmass of plagioclase laths (oligoclase), anorthoclase. X-rich plagioclase and iron ore with subordinate augite, apatite and brown glass. Phenocrystic crystals of opaque minerals and apatite are present.	See Table I-10
26	1-d	Tacaza	Tuff breccia	Corroded crystals of quartz and plagioclase are in a fine grained and altered matrix of albized plagioclase, quartz, iron ore and clay minerals.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
27	1-d	Tacaza	Biotite trachyte	Phenocrysts of biotite (prismatic, up to 1 mm, with a pleochroism of pale brown to reddish brown, corroded and replaced by opaque minerals), plagioclase (prismatic, up to 2mm, andesine zoned, twinned after albite and Carlsbad law) and sanidine are in a fine-grained and almost holocrystalline groundmass of plagioclase (oligoclase to albite), anorthoclase, iron ore and mafic microlites with subordinate apatite and rare brown glass.	
28	1-d	Tacaza	Biotite trachyte (or alkalic dacite)	Phenocrysts of brown biotite (columnar to short prismatic, up to 1 mm, rimmed by opaque minerals and also including opaque minerals and apatite) and plagioclase (prismatic, up to 3mm, andesine, corroded, twinned after albite and Carlsbad law) are in a fine-grained and almost holocrystalline groundmass of plagioclase (oligoclase to andesine), iron ore, subordinate mafic microlite and augite.	
29	1-d	Tacaza	Biotite trachyte	Phenocrysts of brown biotite (subhedral ragged, up to 1 mm, replaced by opaque minerals) and plagioclase (prismatic, up to 3mm, andesine but changed marginally to albite due to the zoning, twinned after albite and Carlsbad law) are in a fine grained and almost holocrystalline groundmass of plagioclase (andesine to oligoclase), iron ore, mafic microlites, apatite and glass. Glass is altered to chlorite.	
30	1-d	Tacaza	Augite-biotite-hornblende trachy andesite	Phenocrysts of augite (subhedral prismatic, corroded, zoned up to 1 mm), biotite (subhedral columnar, up to 1 mm, marginally opacitized, with a pleochroism of pale yellowish brown to brown) hornblende (acicular to prismatic, up to 1 mm, mostly replaced by opaque minerals and/or sericite, with a pleochroism of pale brown to greenish brown), plagioclase (columnar, up to 2mm, corroded, zoned, twinned after albite and Carlsbad law) and sanidine (columnar, up to 3mm) are in a fine-grained and intergranular groundmass of plagioclase lath, hypersthene, augite, iron ore and anorthoclase mesocrystals with subordinate apatite (microphenocrystic) and brown glass. Xenocrysts of plagioclase showing honeycomb texture, up to 3 mm long, are present. The rock shows distinct flow structure.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
31	1-f	Tacaza	Biotite trachyte	Phenocrysts of biotite (columnar, up to 3mm, corroded and thinly mantled by opactite, with a pleochroism of pale greenish brown to dark brown), plagioclase (subhedral columnar, up to 5mm, corroded, weakly zoned, twinned after albite and Carlsbad law), and sanidine (subhedral columnar, up to 5mm) are in a fine-grained and intersertal groundmass of plagioclase, potash feldspar, pyroxene, iron ore, apatite (microphenocrystic) and glass. Tridymite and cristobalite are formed in drusy cavities.	
35	1-g	Tacaza	Biotite-pyroxene-hornblende (alkalic) andesite	Phenocrysts of hornblende (prismatic to acicular, up to 5mm, fairly opactized, with a pleochroism of pale yellowish green to greenish brown), biotite (columnar or prismatic, up to 1 mm, marginally opactized, with a pleochroism of brown to dark brown), augite (prismatic to short prismatic, up to 0.5mm, zoned), hypersthene (prismatic, up to 0.5mm, with a pleochroism of pale green to pale brown), sanidine (columnar, up to 2mm) and plagioclase (columnar, up to 2mm, marginally embayed by opactite, with distinct polysynthetic twinning) are in a medium-grained and intersertal groundmass of plagioclase, potash feldspar, augite, hypersthene, iron ore, apatite and brown glass. Flow structure is distinct. A euhedral microphenocryst of sphene is present.	
40	1-g	Tacaza	Biotite trachyte (or alkalic dacite)	Phenocrysts of sanidine (subhedral, up to 3mm), plagioclase (andesine to oligoclase, subhedral, up to 3mm, zoned), quartz (anhedral, up to 1 mm) and brown biotite (subhedral, up to 2 mm) are in a perocrystalline and intersertal groundmass of plagioclase, iron ore (magnetite and hematite), silica minerals and brown glass.	See Table 1-10
41	2-a	Tacaza	Tuff breccia	Fragments of andesite and crystal fragments of plagioclase, augite, hornblende, biotite, quartz, apatite, opaque minerals and carbonates are in a fine grained and andesitic ash.	
42	2-a	Tacaza	Tuff breccia	Fragments of plagioclase, hypersthene, biotite, apatite, carbonates after pyroxene, epidote after plagioclase and opaque minerals, and lithic fragments of andesite are in a fine grained matrix of andesitic ash.	
43	2-a	Tacaza	Alkalic dacite	Phenocrysts of plagioclase, biotite, hornblende and potash feldspar are in a holocrystalline and intergranular groundmass of potash feldspar, plagioclase, quartz, iron ore and apatite. Apatite and iron ore occur as the microphenocrysts	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
49	2-b	Ferrobamba	Limestone	The rock is mainly composed of equigranular and subhedral to sub-hedral calcite with a little opaque minerals and quartz.	
51	2-b	Tacaça	Altered olivine bearing cracky andesite	The rock may be thermally metamorphosed and originally presumed to be andesite. It is divided into two parts from the different facies: one is fine-grained and the other is coarse-grained. The fine-grained part shows flow texture and is composed of lath-shaped plagioclase, potash feldspar, iron ore and apatite with pseudomorphitic phenocrysts after olivine and plagioclase. It has prismatic biotite and cristobalite in the drusy cavities. The coarse-grained part is composed of columnar plagioclase (probably recrystallized), potash feldspar, iron ore and apatite with pseudomorphitic phenocrysts after plagioclase and olivine.	See Table 1-10
53	2-b	Tacaça	Sandstone	The rock is mainly composed of crystal grains of quartz and altered feldspar, and fragments of volcanics, up to 1 mm in size. The grains of quartz and feldspar are rounded and irregularly cracked.	
56	2-c	Intrusives	Hornblende-biotite granodiorite	The rock is equigranular and composed mainly of plagioclase (oligoclase), potash feldspar, quartz, biotite and hornblende with accessory iron ore, sphene and apatite. Quartz and potash feldspar show the graphic texture.	
58	2-d	Tacaça	Olivine (alkali) basalt	Phenocrysts of olivine (euhedral tabular, up to 1 mm, altered wholly to iddingsite, occasionally embayed by magmatic corrosion, commonly including octahedral magnetite), titanite (euhedral prismatic but rarely rounded, up to 1 mm, distinctly zoned and occasionally showing the hour-glass structure, with a distinct pleochroism of colours to very pale brown, commonly including magnetite) and zeolites (euhedral to subhedral columnar, occurring as the aggregates of crystals filling the drusy cavities) are in a coarse grained, almost holocrystalline and subophitic to intergranular groundmass of plagioclase laths (bytownite to labradorite, mantled by anorthoclase), olivine (altered wholly to iddingsite), titanite and iron ore with subordinate anorthoclase, zeolites (occurring as the interstices), K-rich plagioclase and brown glass.	See Table 1-10

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
60	2-d	Tacaza	Aphitic basalt	The rock is aphitic and rare phenocrysts of augite (euhedral to subhedral, up to 0.5mm, showing parallel intergrowth with hypersthene) are in a medium grained and intergranular groundmass with distinct flow structure composed of plagioclase laths (labradorite to bytownite), augite, anorthoclase interstices and iron ore with subordinate olivine (altered to iddingsite, with the reaction rim of augite), apatite, biotite, cristobalite (rare, occurring as the mesostasis) and brown glass.	
61	2-d	Tacaza	Oxyhornblende-biotite trachyte (or alkalic andesite)	Phenocrysts of oxyhornblende (euhedral prismatic, up to 1 mm, with a pleochroism of pale green to reddish brown), biotite (euhedral, up to 2mm, with the similar pleochroism as oxyhornblende), sanidine and plagioclase (prismatic, up to 3mm, oligoclase, twinned after albite and Carlsbad law) are in a fine grained and intersertal groundmass of plagioclase laths, potash feldspar, iron ore, apatite and chloritized glass. Plagioclase of the groundmass is also oligoclase.	See Table I-10
62	2-d	Tacaza	Hypersthene bearing augite-biotite trachy andesite	Phenocrysts of brown biotite (prismatic to short prismatic, up to 1 mm, replaced largely by opaque minerals), augite (prismatic to granular, up to 1 mm, distinctly zoned), hypersthene (less abundant than augite, prismatic, up to 0.5mm) and pseudomorph after hornblende (aggregates of opaque minerals and augite) are in a medium grained and intersertal groundmass of plagioclase laths (andesine), augite, hypersthene, iron ore with subordinate apatite and brown glass. Zeolites and cristobalite are formed in the drusy cavities.	See Table I-10
63	2-d	Tacaza	Aegirine-augite-olivine trachybasalt	Phenocrysts of olivine (subhedral tabular, up to 0.5mm, altered to iddingsite and rimmed by opactite), augite (subhedral prismatic to granular, up to 0.5mm, distinctly zoned) and aegirine (euhedral prismatic to bladed, up to 0.5mm, with a pleochroism of brown to greenish colour) are in a coarse grained, almost holocrystalline and intergranular groundmass of lath-shaped plagioclase (labradorite to andesine), anorthoclase interstices, olivine, augite, aegirine and iron ore with subordinate apatite, K-rich plagioclase and a little brown glass. Phenocrystic aggregates of magnetite and augite are probably pseudomorph after phenocrysts of augite.	



Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
64	2-d	Tacaza	Aegirine bearing augite-olivine trachybasalt	Phenocrysts of augite (subhedral, up to 0.5mm, including magnetite, distinctly zoned) and olivine (euhedral tabular to subhedral, up to 0.5mm, altered wholly to iddingsite) are in a coarse grained, perocrystalline and intergranular groundmass of lath-shaped plagioclase (labradorite), olivine, augite, anorthoclase, iron ore, aegirine, biotite and a little brown glass. Olivine and aegirine are altered to iddingsite. Analcite is formed in the drusy cavities. Phenocrystic aggregates of magnetite and augite are present. Flow structure is distinctly marked.	
65	2-d	Tacaza	Altered olivine bearing andesitic rock	The rock is wholly altered but phenocrysts of mafic minerals such as olivine, hornblende and biotite (now perfectly replaced by opaque minerals) and plagioclase (altered to clay minerals and acularia) are estimated from their pseudomorphic crystal forms. The groundmass is also entirely altered to clay minerals.	
66	2-d	Tacaza	Olivine-augite trachy andesite	Phenocrysts of augite (subhedral, up to 0.5mm, distinctly zoned) and olivine (euhedral to subhedral tabular, up to 0.5mm, wholly altered to iddingsite) are in a coarse to medium grained, almost holocrystalline and intergranular to intersertal groundmass of plagioclase (labradorite to andesine), olivine, augite, aegirine, iron ore and anorthoclase with subordinate K-rich plagioclase, apatite, analcite mesostasis and brown glass. Analcite is also formed in the drusy cavities.	See Table I-10
67	2-d	Tacaza	Olivine-titanaugite trachy andesite	Phenocrysts of olivine (subhedral tabular, up to 3mm, altered to iddingsite) and titanite (subhedral prismatic, up to 1 mm, including magnetite and apatite, commonly twinned) are in a medium grained and intergranular to intersertal groundmass of plagioclase laths (andesine), olivine, augite, iron ore, anorthoclase interstices, apatite, analcite and a little brown glass. Apatite occurs occasionally as a phenocryst. Olivine of the groundmass is also altered to iddingsite. The flow structure is marked.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
68	2-d	Tacaza	Biotite-olivine bearing hypersthene-augite trachyte andesite	Phenocrysts of augite (euhedral prismatic to subhedral granular, up to 0.5mm), olivine (subhedral tubular, up to 1 mm), slightly altered to iddingsite, surrounded by minute grains of augite, biotite and plagioclase), hypersthene (subhedral prismatic, up to 1 mm), plagioclase (euhedral columnar, up to 2mm, zoned from Ab <sub>50</sub> to An <sub>50</sub> to Ab <sub>65</sub> An <sub>35</sub> , twinned after albite and Carlsbad law, including brown glass) and biotite (columnar, up to 0.5mm, with a pleochroism of pale brown to dark reddish brown, commonly rimmed by opactite) are in a medium grained and intersertal groundmass of plagioclase laths (andesine), hypersthene, augite and iron ore with subordinate apatite and brown glass. Xenocrysts of plagioclase (rounded due to the corrosion, up to 2mm) are present.	See Table 1-10
69	2-d	Tacaza	Hypersthene-augite-biotite trachyte	Phenocrysts of augite (subhedral, up to 1.5mm but commonly finer than 0.5mm, zoned, marginally chloritized), hypersthene (subhedral, up to 0.5mm, marginally chloritized), biotite (subhedral, up to 0.5mm, corroded and marginally opactitized) and plagioclase (columnar, up to 3mm, from Ab <sub>40</sub> An <sub>60</sub> to Ab <sub>70</sub> An <sub>30</sub> , twinned after albite and Carlsbad law) are in a fine to medium grained and intersertal groundmass of plagioclase (andesine to oligoclase), iron ore, hypersthene and augite with subordinate apatite (often microphenocrystic) and brown glass. Tridymite and/or cristobalite are formed in the drusy cavities.	
70	2-d	Tacaza	Hornblende-hypersthene- augite bearing biotite trachyte	Phenocrysts of biotite (subhedral rounded to columnar, up to 2mm, thinly mantled by opactite), hornblende (subhedral acicular, up to 0.5mm, thinly rimmed by opactite), augite (subhedral prismatic, up to 2mm, including magnetite and apatite), hypersthene (subhedral columnar to prismatic, up to 2mm) and plagioclase (columnar to prismatic, up to 2mm, about Ab <sub>50</sub> An <sub>50</sub> , twinned after albite and Carlsbad law) are in a medium grained and intersertal groundmass of plagioclase (andesine), hypersthene, augite and iron ore with subordinate anorthoclase interstices, apatite (microphenocrystic) and brown glass. Cristobalite occurs in the drusy cavities. Xenocrysts of plagioclase (corroded, up to 3mm, with many dusty dark inclusions) are present.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
71	2-d	Tacaza	Hypersthene-augite trachy andesite	Phenocrysts of augite (subhedral, up to 2mm, zoned and corroded), hypersthene (subhedral, up to 1 mm) and pseudomorphitic augite (aggregates of magnetite and augite) are in a medium grained and intergranular groundmass of plagioclase (Ab <sub>50</sub> An <sub>50</sub> to Ab <sub>70</sub> An <sub>30</sub> ), augite, olivine, anorthoclase and iron ore with subordinate apatite, analcime, mesostasis and a little brown glass. Xenocrysts of plagioclase (corroded and with many inclusions) are present. The groundmass shows the distinct flow structure.	See Table I-10
72	2-d	Tacaza	Hypersthene bearing augite trachy andesite	Phenocrysts of augite (subhedral, up to 0.5mm, distinctly zoned and showing hour-glass structure in some crystals) and aggregates of augite and magnetite after augite phenocrysts are in a medium-grained and intersertal groundmass of plagioclase, augite, hypersthene, anorthoclase, iron ore, apatite and a little brown glass.	See Table I-10
73	2-d	Tacaza	Hypersthene-augite-biotite trachy andesite	Phenocrysts of augite (subhedral, corroded, up to 1 mm, zoned), biotite (subhedral, up to 1 mm, with a pleochroism of pale yellowish brown to dark brown, surrounded by hypersthene, plagioclase and magnetite), hypersthene (subhedral, up to 1 mm, with a pleochroism of pale green to pale brown, slightly altered to serfite), plagioclase (columnar, up to 2mm, twinned after albite and Carlsbad law) and potash feldspar (subhedral columnar, up to 2 mm) are in a medium-grained and intersertal groundmass of plagioclase, potash feldspar, augite, hypersthene, iron ore, apatite and glass.	See Table I-10
74	2-d	Tacaza	Olivine trachybasalt	Phenocrysts of olivine (subhedral tabular, elongated parallel to c-crystallographic axis, up to 1 mm long, partly altered to iddingsite, occasionally embayed by magmatic corrosion) are in a coarse-grained and intergranular groundmass of lath-shaped plagioclase, olivine, augite, anorthoclase interstitials, iron ore with subordinate K-rich plagioclase, biotite, apatite and brown glass. Olivine and augite of the groundmass are fairly altered to iddingsite. Biotite may be titanbiotite. Flow structure is distinctly marked.	See Table I-10
75	2-d	Tacaza	Olivine trachybasalt	Phenocrysts of olivine (subhedral tabular, up to 1 mm, almost wholly replaced by opaque minerals) are in a medium-grained and intergranular groundmass of plagioclase, anorthoclase, olivine, augite, iron ore with subordinate zeolites and brown glass. Zeolites are secondary products and also occur in drusy cavities.	See Table I-10

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
76	2-d	Tacaza	Olivine (alkali) basalt	Phenocrysts of olivine (subhedral tabular, elongated parallel to c-crystallographic axis, somewhat corroded, fairly altered to iddingsite) and plagioclase (euhedral prismatic, up to 0.5mm, zoned, twinned after albite and Carlsbad law) are in a coarse-grained and intergranular groundmass of plagioclase laths, anorthoclase, olivine, augite, iron ore, apatite and brown glass. Plagioclase laths are thinly mantled by anorthoclase and their compositions are estimated as $Ab_{40}An_{60}$ to $Ab_{30}An_{70}$ .	
79	2-c	Tacaza	Hyperssthene bearing augite-biotite trachyte	Phenocrysts of plagioclase (andesine, subhedral to euhedral, up to 4mm, zoned), augite (subhedral to euhedral, up to 4 mm) and biotite (subhedral to anhedral, up to 2mm, opacitized and replaced by iron ore) are in an intersertal groundmass of plagioclase, augite, hyperssthene, iron ore (magnetite and hematite), brown glass, apatite and silica minerals including quartz.	See Table I-10 and I-18
83	2-c	Tacaza	Olivine-biotite bearing hyperssthene-augite trachyte	Phenocrysts of olivine (euhedral, up to 1 mm, entirely altered to iddingsite and chlorite, surrounded by anorthoclase), augite (subhedral, up to 1.5 mm, partly chloritized), hyperssthene (subhedral, up to 1.5mm, with a pleochroism of pale green to pale brown, partly chloritized) plagioclase (columnar, up to 2mm, distinctly zoned from andesite to albite, twinned after albite and Carlsbad law), sanidine (columnar, up to 2 mm) and acicular biotite are in a medium-grained and intersertal groundmass of plagioclase, potash feldspar, augite, hyperssthene, iron ore, apatite and brown glass. Plagioclase of the groundmass is $Ab_{60}An_{40}$ or more acidic. Brown glass is commonly altered to chlorite. Xenocrysts of plagioclase (rounded by corrosion and showing honeycomb texture) are present.	See Table I-10
91	2-g	Tacaza	Augite bearing hornblende-biotite trachyte	Phenocrysts of augite (subhedral, up to 2mm, distinctly zoned), hornblende (acicular to short prismatic, up to 0.5mm, marginally opacitized, with a pleochroism of pale yellowish green to brownish green), biotite (columnar, up to 2mm, marginally opacitized, with a pleochroism of yellowish brown to reddish brown), plagioclase (columnar but slightly rounded, up to 2mm, distinctly zoned, twinned after albite and Carlsbad law) and sanidine (subhedral columnar, up to 2 mm) are in a fine-grained and intersertal groundmass of plagioclase, potash feldspar, augite, biotite, iron ore, apatite and brown glass. A rounded xenolith, about 5mm in diameter, is contained. The xenolith is a coarse-grained and equigranular rock showing recrystallized texture by thermal effect and is composed of plagioclase, augite, biotite, iron ore and apatite. The original rock may be basic tuff. Further, the compositions of plagioclase are andesine to Labradorite in the phenocrysts and andesine in the groundmass.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
95	2-g	Tacaza	Bronzite-augite andesite	Phenocrysts of augite (subhedral prismatic, up to 0.5mm, distinctly zoned) and bronzite (subhedral prismatic, up to 0.5 mm, with a pleochromism of colorless to pale brown, having the dispersion of $7.7 \times 10^{-4}$ , often surrounded by augite) are in a medium-grained and interstitial groundmass of plagioclase lath, crystalite? mesocrysts, anorthoclase interstices, augite, bronzite, iron ore with subordinate apatite and brown glass. The rock is fairly aphanitic and similar to Sanukite. The flow structure is distinct.	
97	3-a	Intrusive	Altered microgranite	Phenocrysts of plagioclase, potash feldspar and pseudomorphitic hornblende (altered to the aggregates of iron ore and carbonates) are in a holocrystalline and microgranular groundmass of plagioclase, quartz and iron ore. Some microphenocrysts of apatite are present. Plagioclase are partly replaced by carbonates and epidote.	
101	3-c	Tacaza	Olivine bearing hornblende-biotite trachy andesite	Phenocrysts of biotite (euhedral, up to 1 mm, intensely opacitized), hornblende (euhedral, up to 1 mm, marginally opacitized and also wholly replaced by opaque minerals), olivine (entirely altered to iddingsite) and plagioclase (less abundant than the former three minerals, unbedded, twinned after albite and Carlsbad law, andesine) are in a medium grained and interstitial groundmass of plagioclase laths (andesine), olivine, pyroxene and iron ore with subordinate brown glass.	See Table I-10
102	3-c	Seneca	Biotite-hornblende rhyolitic pitchstone	Phenocrysts of biotite (euhedral prismatic, up to 1 mm), hornblende (euhedral prismatic, up to 1 mm) and plagioclase (oligoclase, euhedral columnar, up to 2mm, partly corroded and containing brown glass) are in a vitric groundmass composed mainly of brown glass with subordinate hornblende needles, plagioclase microclites, iron ore and apatite. The groundmass shows the flow structure and also the perlitic texture.	
104	3-c	Bartoso	Augite bearing hornblende andesite	Phenocrysts of hornblende (euhedral acicular to prismatic, up to 1 mm, wholly replaced by opaque minerals and augite) and augite (subhedral prismatic, up to 0.3mm) are in a medium grained and percrystalline groundmass of plagioclase, hypersthene, augite, cristobalite mesocrysts and iron ore with subordinate apatite and brown glass. Tridymite is formed in the drusy cavities.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
107	3-c	Tacaza	Olivine (alkali) basalt	Phenocrysts of olivine (subhedral to subhedral tabular, up to 0.5 mm, marginally and along fine fractures of crystals altered to iddingsite, often deeply embayed by magnetite corrosion), augite (less abundant than olivine, subhedral, up to 1 mm, distinctly zoned) and plagioclase (columnar, up to 1 mm, twinned after albite and Carlsbad law but rare polysynthetic twin, zoned from $Ab_{50}An_{70}$ to $Ab_{60}An_{60}$ ) are in a coarse-grained and intergranular groundmass of plagioclase lath ( $Ab_{50}An_{50}$ to $Ab_{50}An_{50}$ ), olivine, augite, iron ore, anorthoclase, K-rich plagioclase, analcite, apatite and brown glass. Analcite also occurs in fine amygdaloidal cavities.	
113	4-a	Tacaza	Altered olivine (alkali) basalt	Phenocrysts of olivine pseudomorph (subhedral, up to 1 mm, entirely altered to iddingsite and carbonates) are in a coarse-grained, almost holocrystalline and intergranular groundmass of lath-shaped plagioclase, olivine, augite and iron ore with subordinate apatite, anorthoclase and a little brown glass. The alteration in the groundmass is also very advanced. Olivine and augite are altered to iddingsite and chlorite. Plagioclase and anorthoclase are albitized and sericitized.	
114	4-b	Sencca	Rhyolitic tuff	Fragments of quartz and altered plagioclase (up to 0.5 mm in size) and altered lithic fragments are in a very fine grained and partly spherulitic groundmass of volcanic ash.	
115	4-b	Sencca	Rhyolitic tuff	Fragments of quartz, plagioclase and biotite and lithic fragments of dacite are in a fine-grained and vitric groundmass with altered plagioclase, quartz, iron ore and apatite. Biotite and plagioclase are partly replaced by carbonates.	
119	4-c	Tacaza	Olivine-augite trachy basalt	Phenocrysts of olivine (subhedral tabular, up to 1 mm, altered wholly to iddingsite), titanite (subhedral prismatic to short prismatic, distinctly zoned, including magnetite and occasionally olivine, up to 2 mm in size) and plagioclase (labradorite to bytownite, subhedral, up to 2 mm, twinned after albite and Carlsbad law, thinly mantled by anorthoclase) are in a coarse-grained, almost holocrystalline and intergranular groundmass of lath-shaped plagioclase (labradorite), olivine, titanite and iron ore with subordinate anorthoclase, apatite and brown glass. Analcite occurs in the amygdaloidal cavities.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
120	4-c	Seneca	Hornblende-augite trachyte (or alkalic dacite)	Phenocrysts of augite (corroded, including magnetite, showing slightly purplish tint, distinctly zoned), plagioclase (subhedral columnar, up to 3mm, andesine in composition, zoned) and pseudo-morphic hornblende (elongated aggregates of augite and magnetite, up to 1.5mm) are in a medium-grained and almost holocrystalline groundmass of plagioclase laths, augite, crystallic mesoetasia, iron ore with subordinate anorthoclase, apatite and brown glass. Cristobalite also occurs in the drusy cavities.	
125	4-d	Tacaza	Augite-olivine trachy andesite	Phenocrysts of olivine (ragged in shape, up to 1 mm, altered entirely to iddingsite) and augite (subhedral, up to 0.5mm, partly altered) are in a medium-grained, holocrystalline and intergranular groundmass with distinct flow structure which is composed of plagioclase laths (labradorite to andesine), anorthoclase interstices, olivine, augite and iron ore with subordinate analcite and rare brown glass. Olivine of the groundmass is also altered to iddingsite or replaced by magnetite. Analcite and other zeolites occur in the drusy cavities.	See Table I-10
126	4-d	Tacaza	Rhyolite	Phenocrysts (up to 3mm in size) of corroded quartz, plagioclase and sanidine are in a very fine-grained and spherulitic groundmass. Cristobalite and tridymite are formed in the drusy cavities.	
128	4-d	Tacaza	Altered olivine basalt	Phenocrysts of olivine (euhedral, wholly altered to iddingsite) and augite (subhedral, up to 1 mm, zoned) are in a coarse-grained and hyalophitic groundmass of plagioclase lath, augite, iron ore anorthoclase and a little glass. Zeolites occur in drusy cavities. Secondary cristobalite is formed in the groundmass.	
136	4-f	Copornaque	Sandstone	Crystal grains of plagioclase, potash feldspar, quartz and iron ore, and fragments of volcanic rocks are in a fine-grained matrix of quartz, plagioclase, chlorite, sericite and clay minerals.	
142	5-a	Seneca	Biotite rhyolite	Phenocrysts of brown biotite (subhedral columnar, up to 1 mm, marginally opacitized), quartz (angular, corroded, up to 2mm) and plagioclase (andesine to albite, corroded, always mantled by albite) are in a fine-grained groundmass of abundant spherules and feldspars altered wholly to albite and clay minerals.	See Table I-10

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
155	S-c	Barroso	Augite-olivine basalt		The rock is aphyric. A little phenocrysts of olivine (surrounded by reaction rim of hypersthene, altered wholly to iddingsite) and augite (short prismatic, up to 0.3mm, generally embayed by magmatic corrosion) are in a medium grained and intergranular groundmass of lath-shaped plagioclase (about Ab <sub>40</sub> An <sub>60</sub> , thinly mantled by anorthoclase), augite, hypersthene, iron ore, anorthoclase, apatite and brown glass. The granular hypersthene of the groundmass occasionally contains minute olivine (altered to iddingsite).
160	S-d	Seneca (Tacaza?)	Altered olivine-pyroxene trachy andesite		Phenocrysts of mafic minerals are wholly altered to sericite and chlorite but are estimated to be olivine and pyroxene from their pseudomorphous crystal forms. Plagioclase phenocrysts are euhedral prismatic in shape, up to 2mm in size, twinned after albite and Carlsbad law, zoned and labradorite in composition. The groundmass is medium-grained and interseral, and consists of plagioclase laths (andesine), iron ore, chloritized pyroxene, apatite and chloritized glass.
163	S-e	Tacaza	Olivine (alvati) basalt		Phenocrysts of olivine (euhedral tabular, up to 1 mm, wholly altered to iddingsite) are in a coarse-grained, almost holocrystalline and intergranular groundmass of plagioclase (lath-shaped, labradorite), olivine, titanite, iron ore, analcite and little brown glass. Analcite and other zeolites are formed in drusy cavities.
165	S-e	Tacaza	Olivine (alvati) basalt		Phenocrysts of olivine (euhedral tabular, up to 0.5mm, marginally chloritized), plagioclase (labradorite, up to 0.5mm, zoned and twinned after albite and Carlsbad law) are in a coarse-grained, almost holocrystalline and intergranular groundmass of plagioclase laths (labradorite, mantled by anorthoclase), olivine, augite, iron ore, anorthoclase, apatite, biotite (titaniferous?) and chloritized glass.
168	S-e	Seneca	Rhyolitic tuff		Crystals of quartz and plagioclase, aggregates of opaque minerals and chlorite after mafic minerals and lithic fragments of volcanics (up to 1.5mm in size) are in a fine-grained and albitized groundmass. The groundmass partly shows spherulitic texture.
170	S-f	Seneca	Dacitic tuff breccia		Crystal fragments (up to 3mm in size) of plagioclase (andesine to oligoclase) and sanidine and lithic fragments of altered volcanic rocks are in a fine-grained matrix of dusts and spherules.



Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
172	5-f	Intrusive	Granodiorite	The rock is hypidiomorphic and the main constituent minerals are plagioclase (oligoclase to acidic andesine), perthite feldspar, microcline and hornblende. Accessory minerals are apatite, sphene and iron ore. Hornblende is ragged in shape and includes magnetite and apatite. Plagioclase is partly replaced by sericite or epidote and hornblende is altered to chlorite.	
174	5-f	Coporaque	Sandstone	Subangular to rounded crystals (up to 2mm in size) of quartz, potash feldspar and plagioclase, and lithic fragments are in a fine grained and carbonatized matrix. The sorting is bad.	
182	5-g	Intrusives	Granodiorite	The rock shows hypidiomorphic texture and is composed of subhedral and green hornblende, brown biotite, euhedral to subhedral plagioclase (andesine to oligoclase), anhedral microcline, orthoclase and quartz with accessory iron ore and apatite. Orthoclase is slightly altered to kaolinite.	
200	6-b	Barroso	Hypersthene-augite-olivine andesite	Phenocrysts of olivine (euhedral tabular, up to 1 mm, partly altered to iddingsite, occasionally embayed by magmatic corrosion and surrounded by reaction rim of hypersthene), augite (subhedral prismatic, up to 1 mm, zoned and twinned) and hypersthene (prismatic, up to 0.5mm), and xenocrysts of plagioclase (anhedral, up to 2mm, containing arranged dusty-inclusions along the crystal margin, about $Ab_{70}An_{30}$ ) are in a medium-grained and intergranular ground-mass with flow structure, which is composed of lath-shaped plagioclase (about $Ab_{50}An_{50}$ ), hypersthene, olivine, anorthoclase interstices, iron ore, apatite, biotite and a little brown glass.	
203	6-b	Tacaza	Olivine-augite trachy andesite	Phenocrysts of olivine (euhedral tabular, up to 0.5mm, wholly replaced by iddingsite and/or magnetite), augite (euhedral prismatic, up to 1 mm, slightly chloritized) and plagioclase (euhedral prismatic, up to 2mm, twinned after albite and Carlsbad law, zoned from labradorite to andesine) are in a medium-grained and interseral groundmass of plagioclase (lath-shaped, andesine), olivine, augite and iron ore with subordinate anorthoclase, apatite, analcite and brown glass. Olivine and augite in the groundmass are almost altered to chlorite. Plagioclase laths are thinly mantled by anorthoclase.	See Table I-10

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
215	6-d	Barroso	Hornblende-hypersthene-augite andesite	Phenocrysts of augite (subhedral prismatic, up to 0.5 mm, twinned and zoned), hypersthene (prismatic, up to 0.5mm, with a pleochroism of colourless to pale brown) and altered hornblende (wholly replaced by opaque minerals) are in a fine-grained and interstitial groundmass with flow structure, which is composed of plagioclase laths (andesine), cristobalite mesostasis, hypersthene, iron ore, apatite, and brown glass. Phenocrysts of plagioclase are absent.	
217	6-d	Tacaza	Altered andesitic rock	Phenocrysts are wholly altered to carbonates, but the original minerals are considered to be olivine, pyroxene and plagioclase from their pseudomorphic crystal forms. The groundmass shows a medium-grained and interstitial texture, and is composed of plagioclase laths (albitized), augite (altered to iddingsite and/or carbonates), iron ore, anorthoclase, apatite and glass. Cristobalite occurs in drusy cavities.	
218	6-d	Seneca	Altered rhyolite	Phenocrysts (up to 3mm in size) of subhedral quartz and plagioclase (oligoclase) are in a fine grained and altered groundmass of quartz, albitized plagioclase, potash feldspar altered intensively to clay minerals, apatite, iron ore and altered glass.	
221	6-d	Tacaza	Tuff breccia	Crystals of quartz, albitized plagioclase, altered mafic minerals and opaque minerals, and lithic fragments of volcanics are in a vitric matrix.	
222	6-d	Seneca	Rhyolitic welded tuff	Crystals of angular and corroded quartz, Na-rich plagioclase and sanidine (up to 2mm in size) are in a vitric matrix partly showing spherulitic texture.	
240	7-b	Seneca	Hypersthene-augite bearing biotite dacite	Phenocrysts of biotite (prismatic but marginally opacitized and ragged, up to 1 mm, with a pleochroism of colourless to brown), augite (subhedral, up to 1.2mm, distinctly zoned), hypersthene (subhedral, up to 0.5mm, with a pleochroism of colourless to pale brown), plagioclase (subhedral prismatic to short prismatic, up to 2mm, twinned after albite and Carlsbad law, distinctly zoned, corroded in large ones) and quartz (subhedral rounded and cracked, up to 2mm) are in a fine grained and hyaloplitic groundmass with flow structure, which is composed of plagioclase laths, cristobalite mesostasis, iron ore, apatite, microclites and brown glass.	

Sample No	Location	Formation	Rock	Microscopic observations	Remarks
243	7-b	Tacaza	Pyroxene bearing hyalopilitic trachy andesite	Plagioclase (subhedral prismatic, up to 2mm, twinned after albite and Carlsbad law, distinctly zoned from $Ab_{60}An_{40}$ to $Ab_{75}An_{25}$ ) are in a fine-grained and hyalopilitic groundmass with flow structure which is composed of plagioclase laths, anorthoclase, iron ore, apatite, pyroxene and chloritized glass.	See Table I-10
246	7-b	Seneca	Pyroxene bearing hornblende trachyte	Phenocrysts of plagioclase (subhedral prismatic, up to 3mm, twinned after albite and Carlsbad law, distinctly zoned from $Ab_{40}An_{60}$ to $Ab_{70}An_{30}$ ), hypersthene (subhedral rounded, up to 0.3mm, with pleochroism of colourless to pale brown), augite (subhedral rounded, up to 0.3mm, less abundant than hypersthene) and hornblende (anhedral ragged, up to 1 mm, with pleochroism of pale yellowish green to brownish green, marginally opacitized) are in a fine grained and hyalopilitic groundmass of plagioclase laths, anorthoclase, iron ore, apatite and brown glass. Cristobalite occurs in drusy cavities.	See Table I-10
248	7-b	Seneca	Augite-biotite bearing dacite	The rock is aphyric. A little phenocrysts of plagioclase, augite and biotite are in a medium grained and almost holocrystalline groundmass with flow structure, which is composed of plagioclase laths, cristobalite interstices, iron ore, biotite, apatite and a little brown glass. Cristobalite and apatite are occasionally phenocrystic. Plagioclase laths are about $Ab_{65}An_{35}$ in the composition.	
249	7-b	Seneca	Dacite	Plagioclase (albitized and recrystallized) is in a argillaceous and partly spherulic matrix of albitized plagioclase, silica minerals, clay minerals and iron ore.	
257	7-c	Seneca	Augite bearing biotite dacite	Phenocrysts of brown biotite (up to 1 mm, replaced by opaque minerals and other alteration products), plagioclase (prismatic, up to 4mm, twinned after albite and Carlsbad law, zoned from $Ab_{60}An_{40}$ to $Ab_{70}An_{30}$ ) and augite (subhedral prismatic, up to 0.5mm, less abundant than biotite and plagioclase) are in a fine-grained and interstitial groundmass of plagioclase, cristobalite-tridymite, augite, iron ore, apatite and brown glass. Large xenocrysts of plagioclase (2mm in size, corroded, with many inclusions of dark dusts) are present. Apatite and cristobalite occur as microphenocrysts.	
268	7-d	Seneca	Tuff breccia	Lithic fragments of volcanic rocks (up to 5mm in size, andesite and a little basalt) and crystal fragments of altered plagioclase and mafic minerals are in a fine-grained and strongly chloritized matrix.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
272	7-c	Barroso	Olivine (alkali) basalt	Phenocrysts of olivine (euhedral tabular, up to 1 mm, elongated parallel to c-crystallographic axis, occasionally embayed by magmatic corrosion) are in a coarse-grained, almost holocrystalline and intergranular groundmass of plagioclase laths (basic labradorite), olivine, augite, anorthoclase interstices, analcite mesocrasis and a little brown glass. Plagioclase laths are mantled by anorthoclase. Analcite occurs in drusy cavities.	
273	7-c	Barroso	Olivine basalt	Phenocrysts of olivine (tabular or granular, up to 3mm, marginally altered to iddingsite, occasionally embayed by magmatic corrosion, commonly including magnetite) and plagioclase (prismatic, up to 0.5mm, distinctly zoned) are in a coarse-grained and intergranular to intersertal groundmass of plagioclase, olivine, augite, iron ore, anorthoclase, apatite, analcite and brown glass.	
274	7-c	Barroso	Pumice-tuff	Crystals of quartz, biotite, opaque minerals and plagioclase, and lithic fragments of andesite (up to 3mm in size) are in a vitric welded and partly porous matrix.	
275	7-c	Barroso	Biotite-hornblende andesite	Phenocrysts of biotite (long prismatic to prismatic, up to 2mm, thinly rimmed by apatite), hornblende (long prismatic, up to 6mm, commonly containing apatite, biotite and magnetite, thinly mantled by apatite) and plagioclase (prismatic to columnar, up to 3mm, oligoclase in composition, zoned and twinned after albite and Carlsbad law) are in a medium-grained and intersertal groundmass of plagioclase laths, iron ore, wholly opacitized hornblende needles, cristobalite mesocrasis, hypersthene, apatite and brown glass.	
276	7-f	Tacaza	Hypersthene-augite-olivine basalt	Phenocrysts of olivine (granular, up to 0.5mm, rimmed by augite, altered to iddingsite), augite (euhedral prismatic, up to 0.7mm, distinctly zoned and occasionally showing hour-glass structure), hypersthene (up to 1 mm, deeply embayed by magmatic corrosion, zoned) and plagioclase (less abundant than other phenocrysts, distinctly zoned) are in a coarse grained, perocrystalline and intergranular to intersertal groundmass of plagioclase laths (labradorite), olivine, augite, iron ore, apatite and brown glass. Zeolites are formed in drusy cavities.	
278	7-g	Seneca	Tuff	The rock is composed of very fine volcanic ash including powdery feldspar.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
281	7-g	Tacaça	Olivine (alkali) basalt	Phenocrysts of augite (granular or ragged by magmatic corrosion, up to 2mm but generally less than 1 mm, partly altered to carbonate, distinctly zoned) are in a coarse grained and intergranular groundmass of plagioclase laths (labradorite to basic andesine), olivine (pseudomorph), augite, anorthoclase interstices, iron ore, apatite (microphenocrystic), biotite and brown glass. Xenocrysts of granular quartz (up to 3mm) are surrounded by augite and secondary carbonates.	
283	7-g	Tacaça	Olivine basalt	The rock shows the vitrophyric texture, and euhedral crystals (up to 2mm in size) of olivine, augite, plagioclase and iron ore are scattered in the brown glass. Olivine is slightly altered to iddingsite.	
284	7-g	Tacaça	Olivine bearing bronzite-augite andesite	Phenocrysts of olivine (euhedral tabular, altered to iddingsite, bronzite (euhedral prismatic, with pleochroism of colourless to pale green, with dispersion of $\gamma > \beta$ ) and augite (euhedral, often rimmed by hypersthene) are in a medium-grained, intergranular and percrystalline groundmass with distinct flow structure, composed of lath-shaped plagioclase ( $Ab_{40}An_{60}$ to $Ab_{30}An_{70}$ ), augite, hypersthene and iron ore with subordinate anorthoclase, K-rich plagioclase and a little brown glass.	
285	7-g	Tacaça	Olivine bearing basalt	Phenocrysts of olivine (deeply embayed by magmatic corrosion and reacting with augite) and plagioclase (euhedral, up to 1 cm, including olivine, magnetite and dusty substance, distinctly zoned and commonly twinned after albite and Carlsbad law) are in a coarse grained and holocrystalline groundmass of plagioclase, olivine, augite and iron ore with subordinate hypersthene, apatite and a little cristobalite. Augite is formed by the reaction of olivine and liquid, and hypersthene occurs as the intergrowth to augite. The compositions of plagioclase are about $Ab_{25}An_{75}$ in the phenocrysts and $Ab_{45}An_{55}$ in the groundmass.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
286	7-g	Barroso	Olivine bearing augite-hypersthene andesite	Phenocrysts of olivine (euhedral, up to 0.5mm, occasionally embayed by magmatic corrosion, intensely altered to iddingsite), augite (euhedral prismatic, up to 1 mm), hypersthene (euhedral prismatic, up to 1 mm, with pleochroism of colourless to pale green) and plagioclase (euhedral, up to 2mm, distinctly zoned, about Ab <sub>30</sub> An <sub>70</sub> ) in crystal core, twinned after albite and Carlsbad law) are in a fine grained and intersertal groundmass of lath-shaped plagioclase, augite, hypersthene and iron ore with subordinate cristobalite, apatite and brown glass. Cristobalite and mica are also formed in drusy cavities. The composition of plagioclase in the groundmass is estimated at about Ab <sub>30</sub> An <sub>50</sub> .	
287	1-g	Tacaza	Olivine bearing biotite trachy andesite	Phenocrysts of biotite (euhedral, up to 1 mm, with pleochroism of pale brown to brown, marginally opacitized), plagioclase (euhedral but slightly rounded, up to 5mm, twinned after albite and Carlsbad law, distinctly zoned from Ab <sub>60</sub> An <sub>40</sub> to more acidic) and olivine (microphenocrystic, euhedral, perfectly altered to opaque minerals and/or adularia) are in a intersertal groundmass of plagioclase, analcite, iron ore and apatite with a little augite and pseudomorphitic olivine. The composition of plagioclase in the groundmass is about Ab <sub>75</sub> An <sub>25</sub> .	See Table I-10
296	1-h	Tacaza	Altered olivine basalt	Phenocrysts of pseudomorphitic olivine (altered to carbonates and/or magnetite) and carbonatized plagioclase are in a intersertal groundmass of carbonates after mafic minerals, plagioclase (rimmed by anorthoclase, albitized), anorthoclase and microphenocrystic apatite.	See Table I-10
302	1-h	Tacaza	Olivine bearing biotite trachyte	Phenocrysts of altered olivine, biotite (euhedral, up to 1 mm, with pleochroism of pale green to reddish brown, marginally opacitized) and plagioclase (euhedral, up to 1 cm, twinned after albite and Carlsbad law, distinctly zoned from Ab <sub>60</sub> An <sub>40</sub> to Ab <sub>80</sub> An <sub>20</sub> , generally but weakly replaced by analcite) are in a fine grained and intersertal groundmass of plagioclase (about Ab <sub>80</sub> An <sub>20</sub> ), pyroxene, iron ore, analcite, microphenocrystic apatite and brown glass. Cristobalite, tridymite and zeolites are formed in drusy cavities.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
316	1-k	Puno	Sandstone	Fine fragments (up to 0.5mm in size) of augite, hornblende, plagioclase, quartz, iron ore, apatite and crushed pumice are in a fine grained and argillaceous matrix composed mainly of minute powders of same substances as above-mentioned fragments.	
317	1-k	Puno	Tuffaceous sandstone	Crystal fragments (up to 0.5mm in size) of biotite, hornblende, augite, plagioclase, hypersthene, iron ore and apatite, fragments of glass, pumice and lithic fragments of andesite to dacite are in a fine grained and essential matrix. Recrystallized cristobalite occurs in the matrix.	
328	2-h	Tacaza	Olivine-augite-hypersthene trachy andesite	Phenocrysts of olivine (euhedral, rimmed by vermicular magnetite and hypersthene, partly opacitized), augite (euhedral prismatic, up to 1 mm, distinctly zoned and occasionally showing hour glass structure), hypersthene (euhedral prismatic, up to 1 mm, with pleochroism of pale green to pale brown) and plagioclase (Ab30An70 or more basic, euhedral columnar, twinned after albite and Carlsbad law) are in a medium-grained and interstitial groundmass showing distinct flow structure and composed of lath-shaped plagioclase, augite, hypersthene and iron ore with subordinate anorthoclase, biotite and apatite.	See Table I-10
332	2-h	Semeza	Tuff breccia	Crystal fragments of quartz (rounded and corroded, up to 2mm) and a little plagioclase (entirely altered to clay minerals) are in a fine grained and argillaceous groundmass of minute silica minerals, clay minerals and dusty substances. Flow structure is marked.	
338	2-j	Puno	Sandstone	Fine fragments (under 0.5mm in size) of quartz, augite, hypersthene, hornblende, apatite and iron ore are in a argillaceous matrix which is sericitized and/or carbonatized.	
341	2-l	Tacaza	Altered olivine basalt	Phenocrysts of olivine (euhedral, up to 1 mm, entirely altered to chlorite and adularia, marginally replaced by magnetite) and plagioclase (euhedral, up to 1.5mm, twinned after albite and Carlsbad law, including minute olivine and/or magnetite, slightly altered to kaolinite) are in a medium grained, interstitial to intergranular and devitrified groundmass of lath-shaped plagioclase, pseudomorphitic olivine, zoned augite and apatite with subordinate anorthoclase and brown glass.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
342	2-1	Tacaza	Olivine-augite trachyandesite	Phenocrysts of olivine (altered to iddingsite), plagioclase (altered to chlorite or epidote) and partly chloritized augite are in a intersertal to intergranular groundmass of lath-shaped plagioclase, augite, olivine and iron ore with anorthoclase, apatite and weakly chloritized brown glass.	
344	3-b	Tacaza	Augite-olivine trachybasalt	Phenocrysts of augite (subhedral, up to 0.5mm, less abundant than olivine) olivine (subhedral tabular, up to 0.5mm, wholly altered to iddingsite) and plagioclase (subhedral, up to 0.5mm, distinctly zoned, a little in amount) are in a coarse grained, intergranular and per-crystalline groundmass of lath-shaped plagioclase (about Ab <sub>40</sub> An <sub>60</sub> ), olivine, augite and iron ore with subordinate anorthoclase, K-rich plagioclase, apatite and a little brown glass. Plagioclase laths are always mantled by thin film of anorthoclase.	See Table I-10
349	3-h	Intrusives	Cummingtonite bearing biotite-hornblende-clinopyroxene diorite	The rock shows a medium-grained and hypidiomorphic texture. The main constituent minerals are plagioclase (subhedral, up to 4mm, occasionally showing weak zoning), clinopyroxene (subhedral, up to 3mm, with exsolution lamellae, occasionally forming symplectite with iron ore), hornblende (isolated and anhedral crystals up to 0.8mm and columnar crystals with clinopyroxene core up to 2mm, with a pleochroism of Z=green, Y=yellowish green, X=pale green) and biotite (anhedral, with a pleochroism of Z=Y=reddish brown, X=pale brown). The minor constituent minerals are potash feldspar interstices, cummingtonite, quartz, iron ore (magnetite and hematite), apatite and sphene. Cummingtonite is anhedral and often occurs at the junction of clinopyroxene and hornblende. Subhedral crystals of apatite are remarkable.	See Table I-10 and I-18
350	3-b	Intrusives	Granodiorite	The rock shows a coarse-grained and hypidiomorphic texture, and consists of hornblende (subhedral to subhedral, commonly including minute magnetite and apatite, with a pleochroism of brownish green to dark green), plagioclase (subhedral to subhedral, distinctly zoned and about Ab <sub>50</sub> An <sub>50</sub> in crystal core, twinned after albite and Carlsbad law), potash feldspar (anhedral) and perthite (anhedral) with accessory iron ore and apatite.	



Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
354	3-h	Intrusives	Biotite-hornblende porphyrite		The rock shows a porphyritic texture. The main constituent minerals are plagioclase (phenocrystic, about $Ab_{50}An_{50}$ to $Ab_{70}An_{30}$ , twinned after albite and Carlsbad law), potash feldspar (less abundant than plagioclase), hornblende and biotite. A little relic of augite are present. By the breakdown of hornblende, biotite is formed. Apatite and iron ore present as the accessory minerals.
355	3-h	Intrusives	Hornblende-biotite granodiorite		Hornblende, biotite, potash feldspar, plagioclase and quartz are the main constituent minerals, and apatite and iron ore occur as the accessory minerals. The texture is hypidiomorphic but crystals of plagioclase are somewhat larger than those of other minerals. Plagioclase is marginally zoned and changes its composition from $Ab_{60}An_{40}$ to $Ab_{90}An_{10}$ .
358	3-h	Intrusives	Biotite bearing augite-hornblende diorite porphyrite		The rock shows a porphyritic texture. The main constituent minerals are plagioclase, augite, hornblende and biotite, and apatite and iron ore are present as the accessory minerals. Plagioclase is phenocrystic and distinctly zoned from andesite to oligoclase. Sericitization is fairly advanced and augite remains only as relict. Some of plagioclase are entirely replaced by epidote.
363	3-1	Intrusives	Biotite monzonite		The rock shows hypidiomorphic texture and is mainly made up of biotite (euhedral but ragged by opacitization, with pleochroism of yellowish brown to brown), plagioclase (twinned after albite and Carlsbad law, distinctly zoned from $Ab_{45}An_{55}$ to $Ab_{80}An_{20}$ ) and potash feldspar with accessory apatite, sphene and iron ore.
364	3-1	Descanso	Pumice-tuff		Fine fragments (up to 1 mm in size) of biotite, plagioclase, iron ore, apatite and altered minerals are in a argillaceous matrix.
374	3-m	Puno	Tuffaceous sandstone		Fragments (up to 1.5mm in size) of plagioclase, hornblende, biotite, iron ore, sphene and augite are in a fine-grained matrix composed of albitized plagioclase, dark dusty substances and crushed pumice.

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
376	4-b	Intrusives	Clinopyroxene-cummingtonite bearing biotite-hornblende granodiorite	The rock shows a medium-grained and hypidiomorphic texture. The main constituent minerals are plagioclase (subhedral, up to 5mm, weakly zoned but rarely having the core of calcic plagioclase), quartz (anhedral, up to 2mm, with wavy extinction), potash feldspar (anhedral, up to 2mm, occurring as interstices), hornblende (subhedral, up to 2mm, including poikilolithically clinopyroxene and cummingtonite, with a pleochroism of green to pale greenish yellow) and biotite (anhedral to subhedral, with a pleochroism of dark brown to yellowish brown). The minor constituent minerals are cummingtonite, clinopyroxene, iron ore (magnetite and hematite), apatite, sphene, tourmaline, chlorite, epidote and zircon. Cummingtonite occurs at the junction of hornblende and clinopyroxene in hornblende crystals, and also is occasionally formed as sole inclusions without clinopyroxene.	See Table I-10
377	4-h	Seneca	Dacite	Phenocrysts of quartz (anhedral rounded, up to 5mm, including dark dusty substances and rarely muscovite) and albite (less abundant than quartz) are in a hyalopilitic groundmass with subordinate plagioclase, cristobalite and iron ore.	
389	4-k	Descanso	Dacitic tuff	Crystal fragments (up to 0.5mm in size) of quartz, sericitized biotite, plagioclase, apatite, hornblende and iron ore are in a argillaceous matrix partly showing perlitic texture.	
390	4-l	Ayabacas	Schistose limestone	The rock is composed of calcite. Crystals of calcite are elongated and arranged with orientation. The rock seems to be affected by dynamical stress.	
394	4-m	Tacaza	Hyperssthene bearing olivine-augite trachy andesite	Phenocrysts of olivine (subhedral, up to 0.5mm, entirely altered to chlorite), augite (subhedral, up to 1 mm, including magnetite, distinctly zoned), hyperssthene (less abundant than augite, with pleochroism of colourless to pale green), hornblende (subhedral, up to 2mm, with pleochroism of pale greenish brown to greenish brown, zoned, thickly mantled by opacite), plagioclase (Ab30An70 to Ab40An60, subhedral, up to 1.5mm, twinned after albite and Carlsbad law, distinctly zoned) are in a intergranular to interstitial groundmass of lath-shaped plagioclase (about Ab60An40), augite and iron ore with subordinate anorthoclase, apatite and a little brown glass.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
400	5-m	Tacaza	Altered hypersthene-augite andesitic rock	Phenocrysts of augite (euhedral, up to 1 mm, including magnetite), hypersthene (euhedral to subhedral, up to 1 mm, with pleochroism of colourless to pale brown), plagioclase (about $Ab_{70}An_{30}$ , subhedral, up to 1.5mm, intensely sericitized and/or albitized) and phenocrystic grains of magnetite (up to 2mm) are in a fine-grained and intersertal groundmass of lath-shaped plagioclase, pyroxene (wholly altered to sericite and carbonates), iron ore and microclites.	
406	5-n	Ayabacas	Dolomitic limestone	The rock is mainly composed of fine-grained and irregularly shaped dolomite and calcite.	
416	6-i	Intrusives	Hornblende granodiorite	The texture is hypidiomorphic and hornblende (with pale yellowish green to green, including magnetite, apatite and rare plagioclase), potash feldspar (orthoclase, partly sericitized), plagioclase (albite to acidic oligoclase, distinctly twinned after albite and Carlsbad law, partly sericitized) and microcline are the main constituent minerals. Iron ore, apatite and sphene are observed as the accessory minerals.	
418	6-i	Intrusives	Quartz monzonite porphyry	The texture is porphyritic. Phenocrysts of hornblende (euhedral, up to 2mm, with pleochroism of pale green to green, rimmed by colourless amphibole), plagioclase (generally euhedral, up to 5mm, twinned after albite and Carlsbad law, slightly altered to sericite or epidote), and potash feldspar (subhedral, up to 5mm, partly sericitized) are in a microgranitic groundmass of quartz, potash feldspar and plagioclase with accessory apatite and iron ore.	
420	6-i	Intrusives	Augite-hornblende granodiorite	The texture is hypidiomorphic and it is mainly composed of augite, green hornblende (fairly sericitized), plagioclase (sericitized, oligoclase to andesine) and potash feldspar. Apatite and sphene occur as accessory minerals.	
422	6-j	Intrusives	Quartz monzonite porphyry	The rock is porphyritic and phenocrysts of pseudomorph hornblende (entirely altered to chlorite and/or sericite), potash feldspar (euhedral to subhedral, up to 5mm, partly sericitized), plagioclase (euhedral, up to 5mm, albite to acidic oligoclase, partly sericitized) and quartz (euhedral rounded, up to 1 mm) are in a microgranitic groundmass of quartz, potash feldspar and plagioclase with accessory opaque minerals and apatite. Quartz veinlets fill the cracks.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
423	6-j	Intrusives	Monzonite porphyry	The rock shows a porphyritic texture. Phenocrysts of green hornblende (forming secondary biotite), potash feldspar (euhedral, up to 3mm), plagioclase (much less than orthoclase, euhedral up to 3mm) and a little quartz (anhedral, up to 2mm) are in a microgranitic groundmass of quartz, potash feldspar, plagioclase and iron ore with accessory apatite and sphene. Apatite and sphene are generally euhedral and occasionally occur as the microphenocryst. Quartz veinlets fill the fine cracks of the rock. Feldspars are slightly sericitized.	
425	6-j	Ferrobomba	Garnet skarn	The major constituent mineral is granular garnet and a little actinolitic green-hornblende, sericite and opaque minerals are accompanied with garnet.	
430	6-j	Intrusives	Biotite monzonite porphyry	The rock shows porphyritic texture. Phenocrysts of biotite (euhedral, with pleochroism of pale yellowish brown to dark brown, partly opacitized and/or chloritized), potash feldspar and plagioclase (less abundant than potash feldspar, albite and a little oligoclase) are in a microgranitic groundmass of quartz, potash feldspar and plagioclase with subordinate and microphenocrystic apatite. Feldspars are affected by albitization. Pyrite and chalcopyrite are disseminated.	
431	6-j	Intrusives	Biotite-hornblende granodiorite	The texture is hypidiomorphic. It consists of hornblende (rather ragged, forming secondary biotite due to break down, with pleochroism of pale green to green), biotite (with pleochroism of greenish brown to dark brown), potash feldspar and plagioclase (zoned and albitized, acidic oligoclase to albite) with accessory apatite, sphene and iron ore.	
436	6-m	Tacaza	Lapilli tuff	Crystal fragments (up to 0.5mm) of quartz, plagioclase, opaque minerals and mafic minerals (almost altered to chlorite and/or sericite) and lithic fragments (up to 3mm, andesite and rhyolite) are cemented by argillaceous matrix.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
438	7-h	Tacaza	Olivine bearing biotite dacite	Phenocrysts of biotite (euhedral columnar, up to 1.5mm, thickly surrounded by opaque), plagioclase (euhedral columnar, up to 3mm, distinctly zoned, twinned after albite and Carlsbad law) and a little olivine (subhedral, up to 0.3mm, rimmed by opaque) are in a fine-grained and intersertal groundmass of lath-shaped and albitized plagioclase, cristobalite, microcline, iron ore and brown glass. Phenocrysts of plagioclase have many inclusions such as apatite and dark dusty substances. Clay minerals and adularia are often formed in drusy cavities. The alteration is advanced.	
441	7-h	Tacaza	Olivine trachybasalt	Phenocrysts of olivine (euhedral, tabular or elongated parallel to c-crystallographic axis, up to 4mm, often ragged by magmatic corrosion and commonly including octahedral magnetite) are in a medium-grained, intergranular and perocrystalline groundmass of lath-shaped plagioclase, olivine, augite, hypersthene and iron ore with subordinate anorthoclase and apatite. Large xenocryst of plagioclase (up to 4mm in size), surrounded by minute grains of augite, is recognized. The rock may be mugearite. The composition of plagioclase of the groundmass is about Ab <sub>60</sub> An <sub>40</sub> .	
442	7-h	Tacaza	Olivine trachybasalt	Phenocrysts of olivine (subhedral, up to 1 mm, almost wholly altered to iddingsite) are in a coarse-grained and intergranular groundmass of lath-shaped plagioclase (about Ab <sub>40</sub> An <sub>60</sub> ), olivine (almost altered to iddingsite), augite and anorthoclase with subordinate iron ore, apatite and little brown glass. The reaction between olivine and augite is not recognized. Adularia is formed in the drusy cavities.	See Table I-10
443	7-h	Seneca	Biotite dacite	Phenocrysts of biotite (euhedral, prismatic, up to 1 mm, with pleochroism of pale brown to dark brown) and plagioclase (euhedral, up to 0.7mm, Ab <sub>65</sub> An <sub>35</sub> to Ab <sub>65</sub> An <sub>35</sub> ) are in a fine-grained and hyaloplitic groundmass of plagioclase (about Ab <sub>70</sub> An <sub>30</sub> ), brown glass, cristobalite, iron ore and microcline. Cristobalite also occur in drusy cavities.	

Sample No.	Location	Formation	Rock	Macroscopic observations	Remarks
446	7-1	Tacaza	Olivine-augite (alkali) basalt	Phenocrysts of olivine (subhedral tabular or elongated parallel to c-crystallographic axis, up to 4mm, slightly altered to chlorite), augite (euhedral prismatic, up to 0.7mm, distinctly zoned and occasionally showing hour-glass structure) and plagioclase (not abundant, euhedral, zoned, twinned after albite and Carlsbad law) are in a medium-grained, intergranular and holocrystalline groundmass of lath-shaped plagioclase (Ab <sub>60</sub> An <sub>40</sub> ), augite, olivine and iron with subordinate anorthoclase, K-rich plagioclase, apatite and biotite.	See Table 1-10
448	7-1	Tacaza	Olivine-analcite (alkali) basalt	Phenocrysts of pseudomorphic olivine (entirely altered to carbonates and opacite but remaining cubical crystal form), plagioclase (euhedral, up to 6mm, about Ab <sub>60</sub> An <sub>40</sub> ) and granular analcite are in a almost holocrystalline and intergranular groundmass of lath-shaped plagioclase (about Ab <sub>60</sub> An <sub>40</sub> ), carbonates after olivine, intensely carbonatized augite and iron ore with subordinate anorthoclase, K-rich plagioclase and brown glass. Analcite and other zeolites occur in drusy cavities.	
452	7-1	Intrusives	Granite porphyry	The rock shows porphyritic texture, and phenocrysts of potash feldspar (euhedral, up to 2mm, sericitized), plagioclase (euhedral, up to 2mm, sericitized) are in a microgranitic matrix composed of potash feldspar, (altered to clay minerals), quartz, plagioclase (albitized and also altered to clay minerals) and iron ore. Apatite and iron ore occur as accessory minerals of phenocrysts. Mafic minerals are not recognized in the observed section.	
453-(1)	7-1	Intrusives	Quartz monzonite porphyry	Abundant phenocrysts of potash feldspar and a little phenocrysts of plagioclase and quartz are in a microgranitic groundmass of potash feldspar, plagioclase, quartz and iron ore with accessory apatite and sphene. Phenocrysts of feldspar are euhedral columnar and up to 3mm in size, and are altered partly to sericite and/or carbonates. Phenocrysts of quartz are generally rounded.	
453-(2)	7-1	Intrusives	Porphyritic monzonite	The rock shows a porphyritic texture. Phenocrysts of potash feldspar (columnar, up to 5mm), plagioclase (columnar, up to 5mm, distinctly zoned, twinned albite and Carlsbad law characterized especially by polysynthetic twinning) and biotite (subhedral columnar, up to 0.5mm) are in a fine-grained and microgranitic groundmass of plagioclase, iron ore and apatite.	

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
453-(3)	7-j	Intrusives	Quartz monzonite porphyry	The rock shows a porphyritic texture. Phenocrysts of biotite (columnar to prismatic, up to 0.5mm), potash feldspar (euhedral columnar, up to 2mm), plagioclase (subhedral, up to 2mm, distinctly zoned) and anhedral quartz are in a microgranitic groundmass of potash feldspar, quartz, plagioclase and opaque minerals with accessory apatite. Feldspar are intensively altered to sericite and/or carbonates, and the groundmass also slightly carbonatized.	
453-(4)	7-j	Intrusives	Monzonite porphyry	Phenocrystic crystals of potash feldspar and a little plagioclase are in a microgranular groundmass of potash feldspar, quartz, plagioclase and opaque minerals with accessory sphene and apatite. The alteration is rather advanced; feldspars are sericitized and/or carbonatized, and secondary carbonates fill the cracks.	
453-(5)	7-j	Intrusives	Quartz monzonite porphyry	The rock shows a porphyritic texture. Phenocrysts of potash feldspar, plagioclase (much less than potash feldspar) and a little quartz are in a microgranitic groundmass of potash feldspar, quartz, plagioclase and opaque minerals with accessory apatite. Feldspars are strongly altered to sericite and/or carbonates. Opaque minerals are often present as the phenocrysts.	
453-(6)	7-j	Intrusives	Altered porphyritic monzonite	Phenocrysts of feldspars (wholly altered to sericite and carbonates) hornblende (with opaque margin, perfectly altered to sericite and carbonates) and biotite (perfectly altered to sericite and opacite) are in a microgranitic and altered groundmass.	See Table I-10 and I-18
453-(7)	7-j	Intrusives	Porphyritic monzonite	Phenocrysts of potash feldspar (weakly altered to carbonate), plagioclase (rarely altered to carbonate), biotite (fairly altered to chlorite) and hornblende (perfectly altered to carbonate and marginally opacitized) are in a microgranitic groundmass of plagioclase, potash feldspar, quartz and opaque minerals.	See Table I-10 and I-18
455	7-k	Intrusives	Biotite-olivine-cummingtonite bearing hornblende gabbro	The rock shows a medium-grained, and hypidiomorphic texture. The main constituent minerals are plagioclase (subhedral, up to 5mm but usually 1.5 mm), zoned especially in the comparatively large crystals), hornblende (subhedral columnar, poikilictically including fine crystals of olivine, clinopyroxene and cummingtonite, with a pleochroism of Z-brown, Y-yellowish brown, X-pale brown) and clinopyroxene (anhedral, always occurring as a inclusion of hornblende). The minor or accessory minerals are cummingtonite, olivine, biotite, sphene, apatite, iron ore (magnetite and hematite) and chlorite.	See Table I-10 and I-18

Sample No.	Location	Formation	Rock	Microscopic observations	Remarks
459	7-k	Intrusives	Hornblende-biotite monzonite porphyry	The rock is somewhat porphyritic. Phenocrysts of potash feldspar (subhedral, up to 4mm), plagioclase (less abundant than potash feldspar, subhedral, up to 4mm), brown biotite (columnar, up to 1 mm) and green hornblende (subhedral ragged, up to 1 mm) are in a micro-granitic groundmass of quartz, potash feldspar, plagioclase and iron ore with accessory apatite and sphene.	
461	7-k	Intrusives	Biotite granodiorite	The rock is composed of plagioclase (basic oligoclase), potash feldspar, interstitial quartz, biotite and a little hornblende with accessory apatite and opaque minerals.	
464	7-n	Puro	Rhyolite	Phenocrysts are quartz and plagioclase. Groundmass is composed of feldspar spherulites.	
466	7-n	Puro	Tuffaceous sandstone	The rock is made up of crystal fragments (up to 0.3 mm in size) of quartz, biotite, carbonate, sericite, chlorite, hornblende and opaque minerals. Hornblende and some of feldspar show euhedral crystal form but the others are rounded.	
468	7-k	Intrusives	Biotite-hornblende porphyritic monzonite	The rock shows a porphyritic texture. Phenocrysts of green hornblende (subhedral prismatic, up to 3mm, including magnetite), potash feldspar (subhedral columnar, up to 3mm), plagioclase (oligoclase, subhedral columnar, up to 3mm) and quartz (a little in amount, subhedral, 1 mm) are in a microgranitic groundmass of quartz, potash feldspar, plagioclase, biotite (formed due to the breakdown of hornblende) and opaque minerals with accessory apatite and sphene. Some crystals of apatite and sphene are microphenocrystic.	
469-(1)	7-i	Intrusives	Biotite-hornblende monzonite porphyry	The texture is porphyritic. Phenocrysts of potash feldspar, plagioclase, biotite and hornblende are in a microgranitic groundmass of quartz, plagioclase and potash feldspar with accessory apatite and opaque minerals. Plagioclase and hornblende are fairly altered to sericite and/or epidote. A little secondary biotite are formed due to the breakdown of hornblende.	
469-(2)	7-i	Intrusives	Hornblende-biotite quartz monzonite porphyry	The texture is porphyritic. Phenocrysts of potash feldspar, green hornblende, green biotite, plagioclase and quartz are in a micro-granitic groundmass composed mainly of plagioclase, potash feldspar and quartz. Feldspars are rather strongly altered to sericite and/or epidote, and mafic minerals are also altered to chlorite and epidote. Microphenocrystic opaque minerals and apatite are present.	



Table I-9 Microphotographs

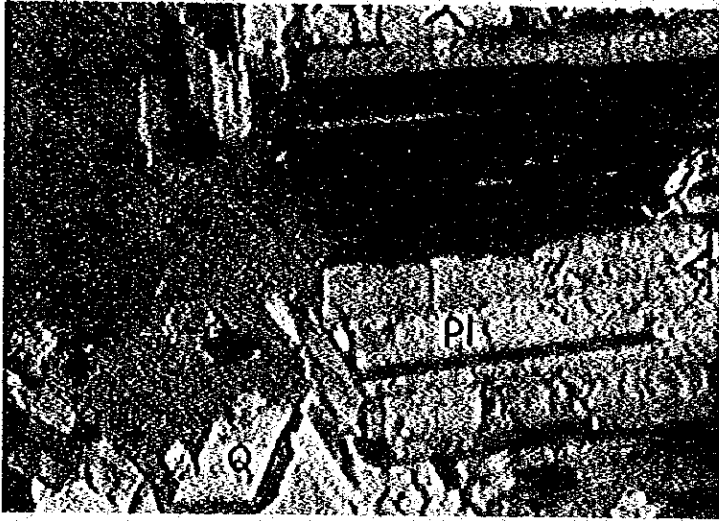
Thin section

	Sample No.	Rock name	Location
(1)	1	Granodiorite	1-a
(2)	9	Quartz diorite	1-b
(3)	27	Trachyte	1-d
(4)	40	Dacite	1-g
(5)	43	Dacite	2-a
(6)	49	Limestone	2-b
(7)	58	Basalt	2-d
(8)	79	Trachyte	2-e
(9)	142	Rhyolite	5-a
(10)	275	Andesite	7-e
(11)	280	Massive tuff	7-g
(12)	316	Sandstone	1-k
(13)	349	Granodiorite	3-h
(14)	350	Monzonite	3-h
(15)	376	Granodiorite	4-h
(16)	394	Andesite	4-m
(17)	430	Granite porphyry	6-j
(18)	442	Basalt	7-h
(19)	453	Monzonite	7-j
(20)	455	Gabbro	7-k

Polished section

(21)	20	Sandstone	1-d
(22)	361	Magnetite ore	3-h
(23)	361	Magnetite ore	3-h
(24)	430	Granite porphyry	6-j
(25)	453	Monzonite	7-j
(26)	469	Garnet skarn	7-l

(1)



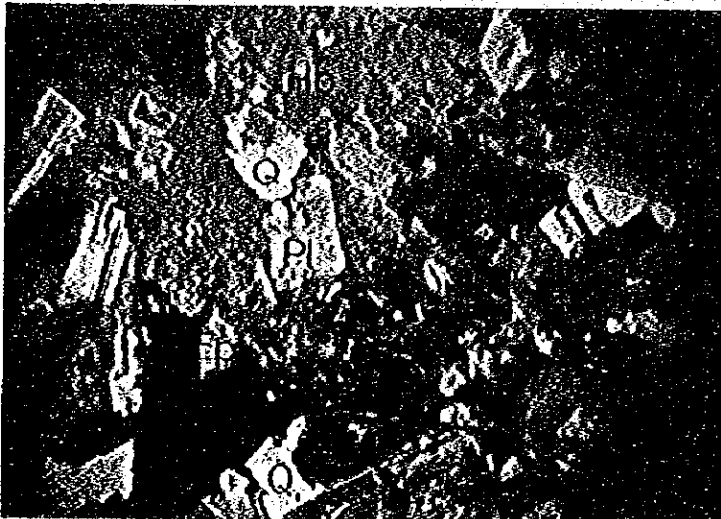
Sample No. 1.  
Granodiorite  
Location 1-a

Pl : plagioclase  
Bi : biotite  
Q : quartz

Scale 0 0.5 mm

Crossed nicols

(2)



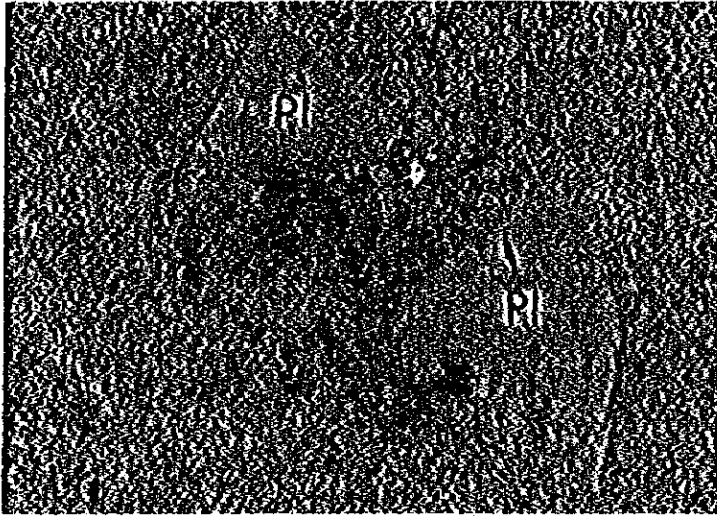
Sample No. 9.  
Quartz diorite  
Location 1-b

Hb : hornblende  
Bi : biotite  
Ep : epidote  
Pl : plagioclase  
Q : quartz

Scale 0 1 mm

Crossed nicols

(3)



Sample No. 27.

Trachyte

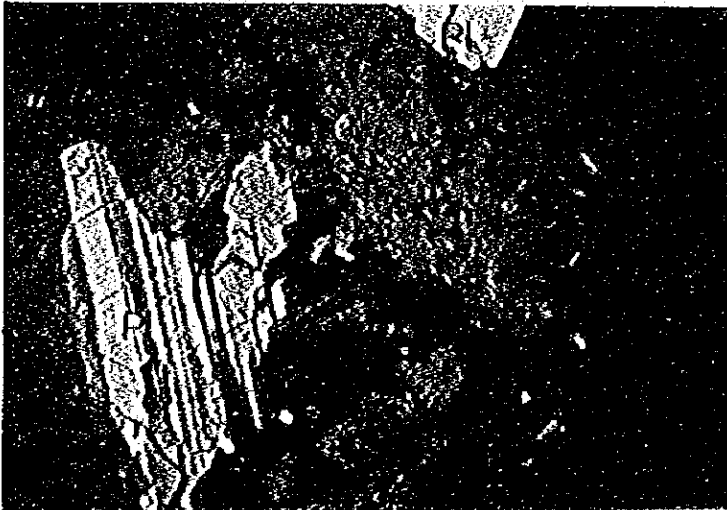
Location 1-d

Pl : plagioclase

Scale 0 0.5 mm

Open nicol

(4)



Sample No. 40.

Dacite

Location 1-g

Pl : plagioclase

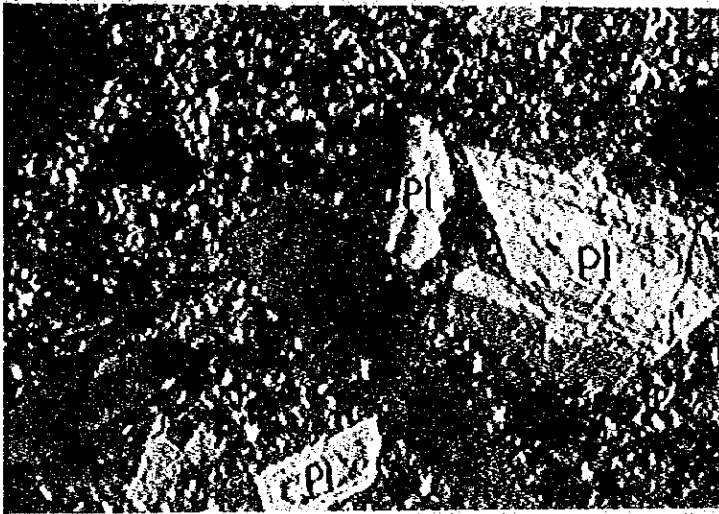
Bi : biotite

Mt : magnetite

Scale 0 1 mm

Crossed nicols

(5)



Sample No. 43.

Dacite

Location 2-a

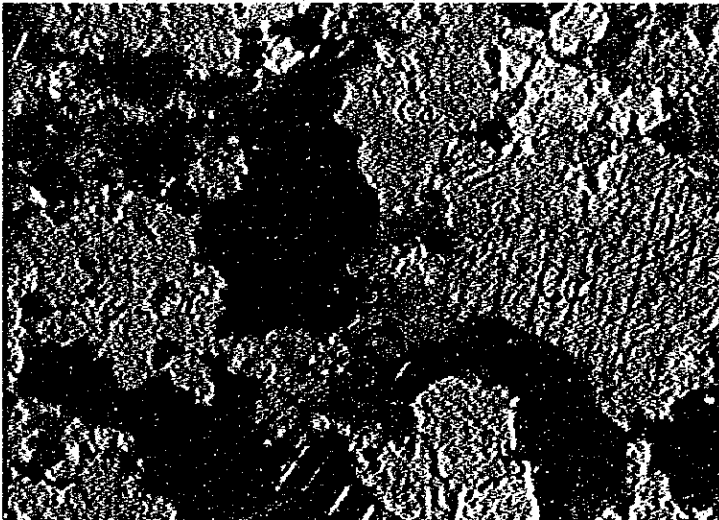
Pl : plagioclase

Bi : biotite

Scale 0 0.5 mm

Crossed nicols

(6)



Sample No. 49.

Limestone

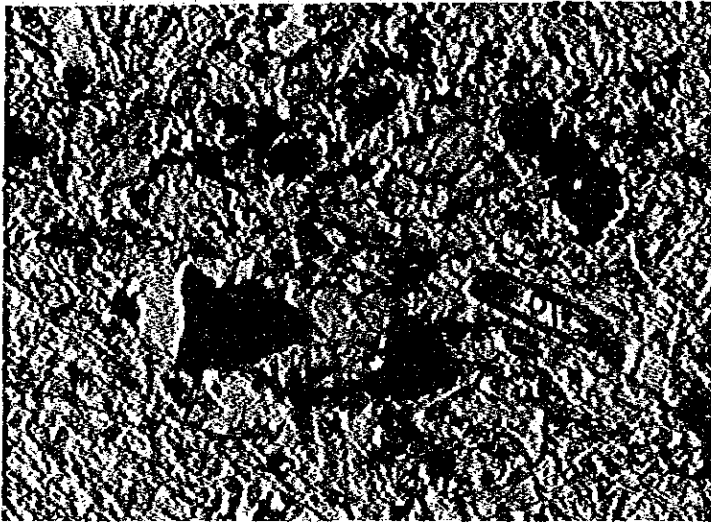
Location 2-b

Ca : calcite

Scale 0 0.5 mm

Crossed nicols

(7)



Sample No. 58.

Basalt

Location 2-d

Ol : olivine

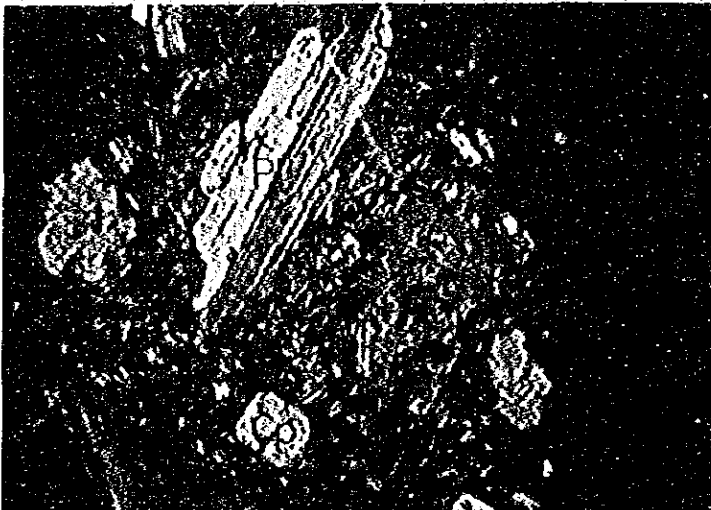
Cp : clinopyroxene

Pl : plagioclase

Scale 0  0.5 mm

Open nicol

(8)



Sample No. 79.


Trachyte

Location 2-e

Cp : clinopyroxene

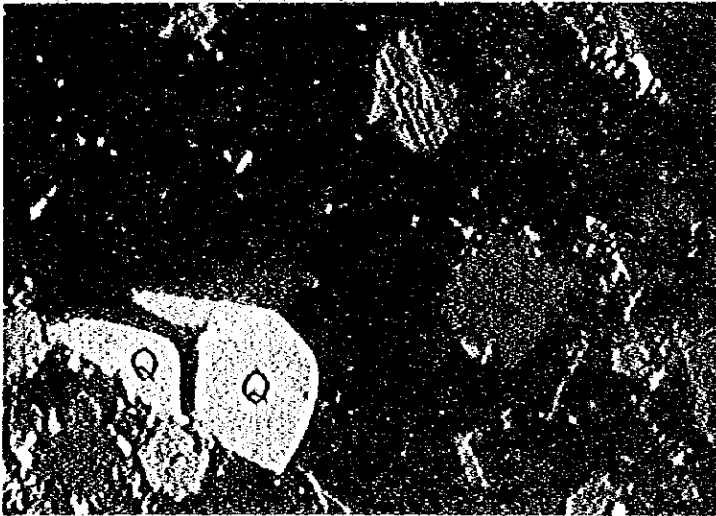
Bi : biotite

Pl : plagioclase

Scale 0  1 mm

Crossed nicols

(9)



Sample No. 142.

Rhyolite

Location 5-a

Bi : biotite

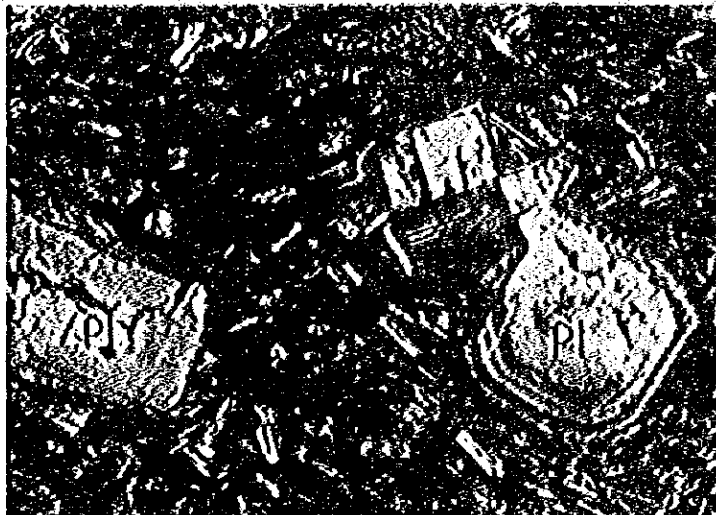
Pl : plagioclase

Q : quartz

Scale 0 0.5 mm

Crossed nicols

(10)



Sample No. 275.

Andesite

Location 7-e

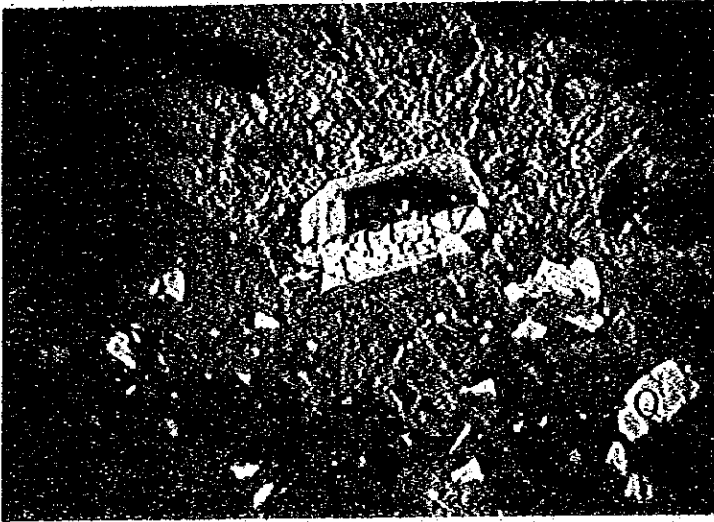
Hb : hornblende

Pl : plagioclase

Scale 0 0.5 mm

Crossed nicols

(11)



Sample No. 280.

Massive tuff

Location 7-g

Pl : plagioclase

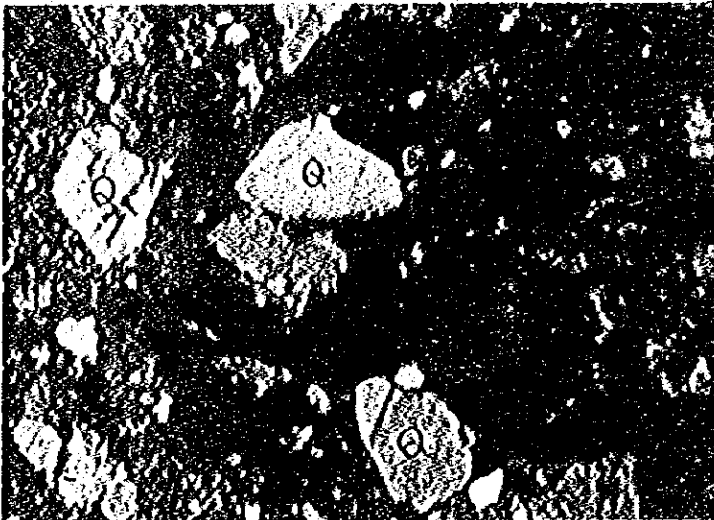
Bi : biotite

Q : quartz

Scale 0 1 mm

Crossed nicols

(12)



Sample No. 316.

Sandstone

Location 1-k

Pl : plagioclase

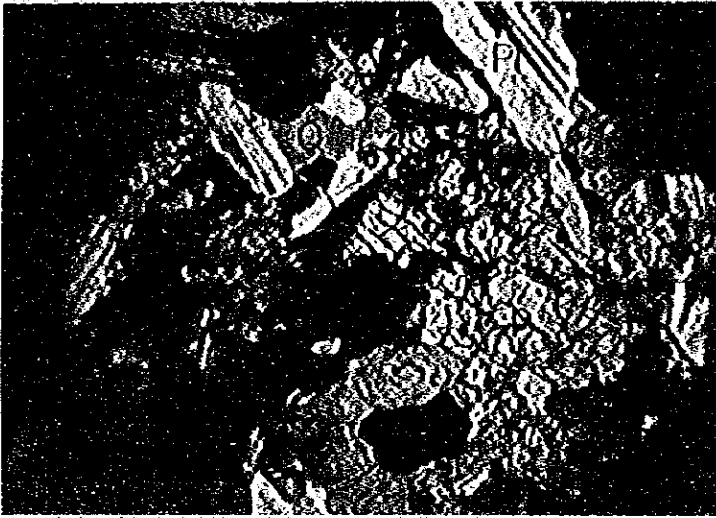
Bi : biotite

Q : quartz

Scale 0 0.5 mm

Crossed nicols

(13)



Sample No. 349.

Granodiorite

Location 3-h

Cp : clinopyroxene

Hb : hornblende

Bi : biotite

Pl : plagioclase

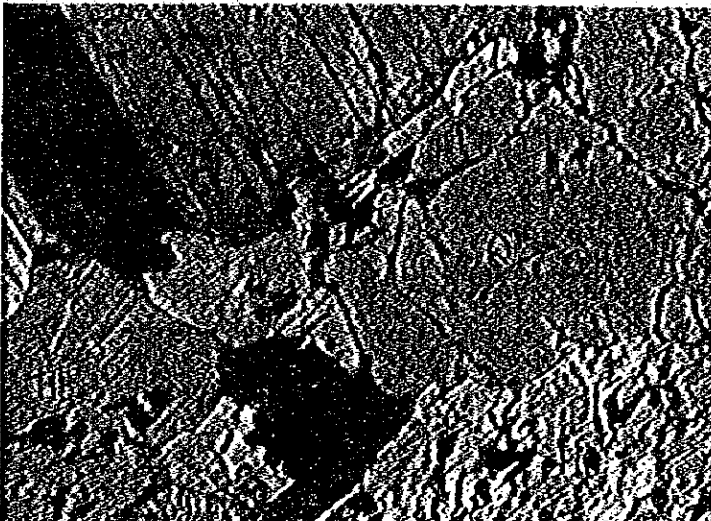
Q : quartz

Mt : magnetite

Scale 0 1 mm

Crossed nicols

(14)



Sample No. 350.

Monzonite

Location 3-h

Hb : hornblende

Pl : plagioclase

Q : quartz

Scale 0 0.5 mm

Crossed nicols



(15)



Sample No. 376.  
Granodiorite  
Location 4-h

Hb : hornblende  
Cp : clinopyroxene  
Ct : cumingtonite  
Bi : biotite  
Pl : plagioclase  
Q : quartz

Scale 0 1 mm

Crossed nicols

(16)



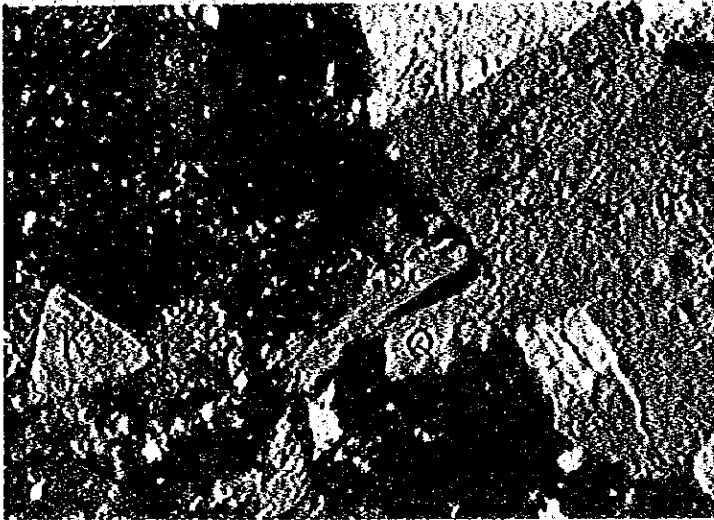
Sample No. 394.  
Andesite  
Location 4-m

Hb : hornblende  
Pl : plagioclase

Scale 0 0.5 mm

Crossed nicols

(17)



Sample No. 430.

Granite porphyry

Location 6-j

K : K-feldspar

Bl : biotite

Q : quartz

Scale 0 0.5 mm

Crossed nicols

(18)



Sample No. 442.

Basalt

Location 7-h

Z : zeolite

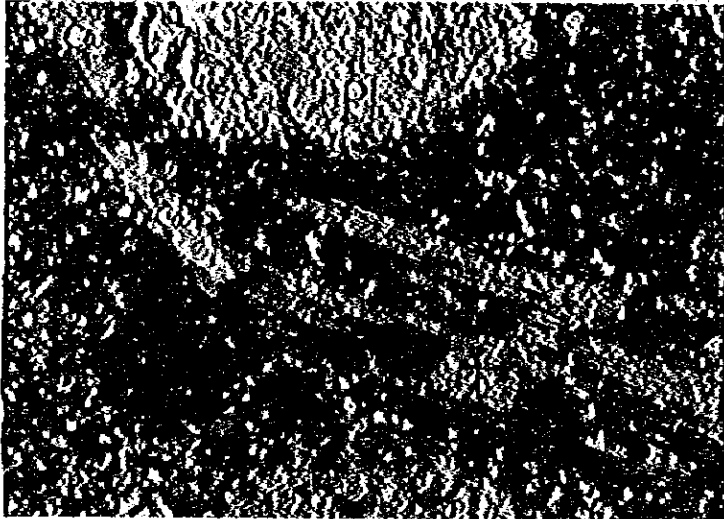
Ol : olivine

Pl : plagioclase

Scale 0 0.5 mm

Crossed nicols

(19)



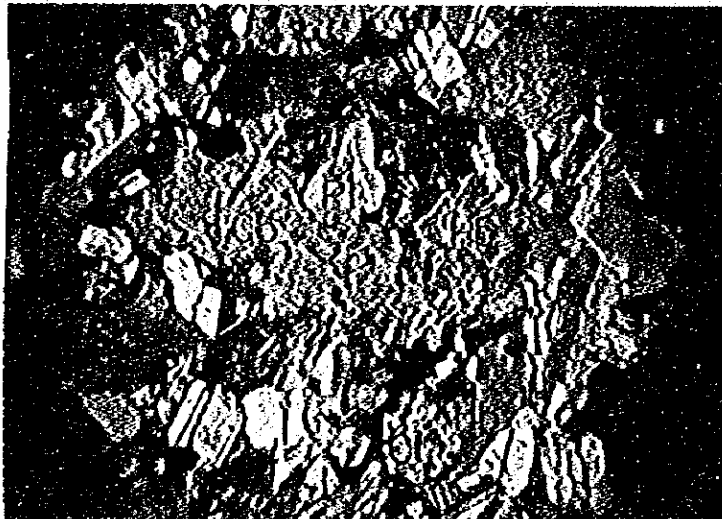
Sample No. 453.  
Monzonite  
Location 7-j

Wm : white mica  
Pl : plagioclase  
Ca : calcite

Scale 0 0.5 mm

Crossed nicols

(20)



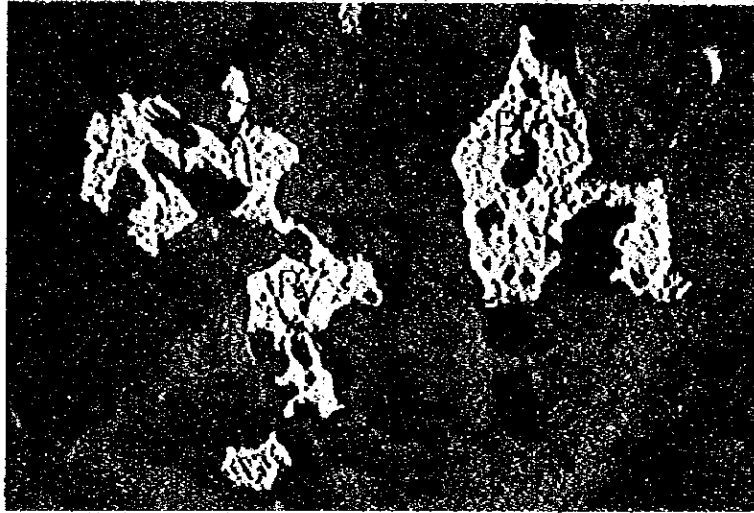
Sample No. 455.  
Gabbro  
Location 7-k

Hb : hornblende  
Cp : clinopyroxene  
Ct : cummingtonite  
Pl : plagioclase

Scale 0 1 mm

Crossed nicols

(21)



Sample No. : 20.

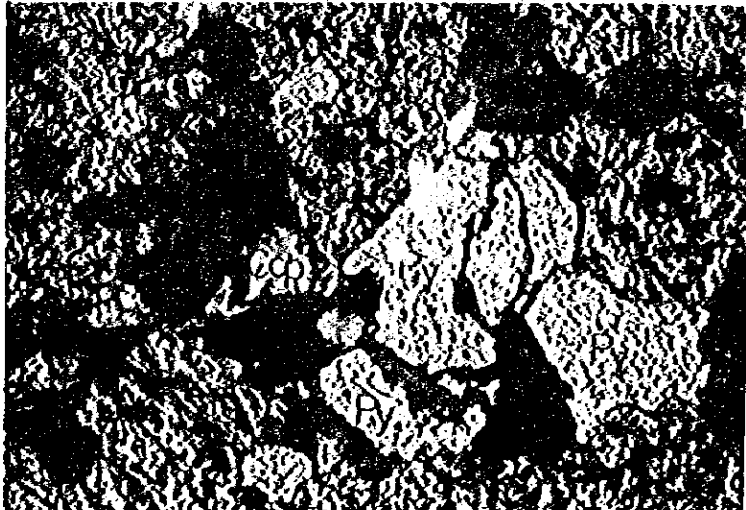
Disseminated pyrite  
Country rock : Sandstone  
Location : i-d

Py : pyrite

Scale 0 0.5 mm

Open nicol

(22)



Sample No. : 361.

Pyrite chalcopyrite  
bearing magnetite ore  
Location : j-h

Ccp : chalcopyrite

Py : pyrite

Mg : magnetite

Scale 0 0.5 mm

Open nicol

(23)



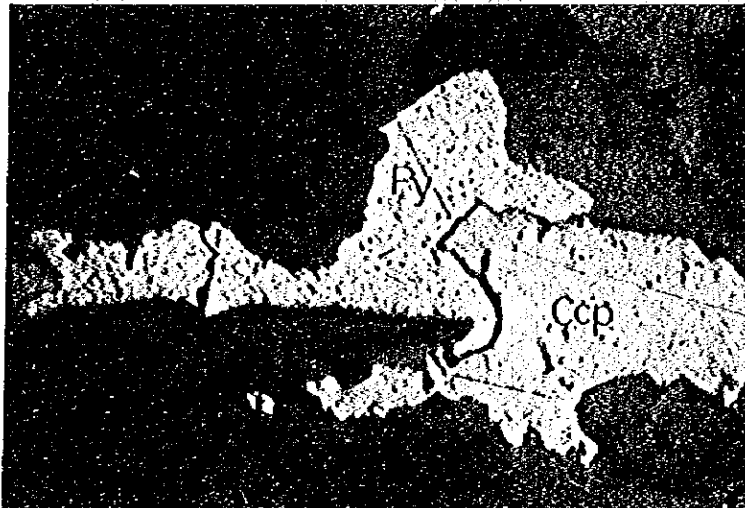
Sample No. : 361.  
Pyrite chalcopyrite  
bearing magnetite ore  
Location : 3-h

Py : pyrite  
Ccp : chalcopyrite  
Cov : covellite  
Mg : magnetite

Scale 0 0.2 mm

Open nicol

(24)



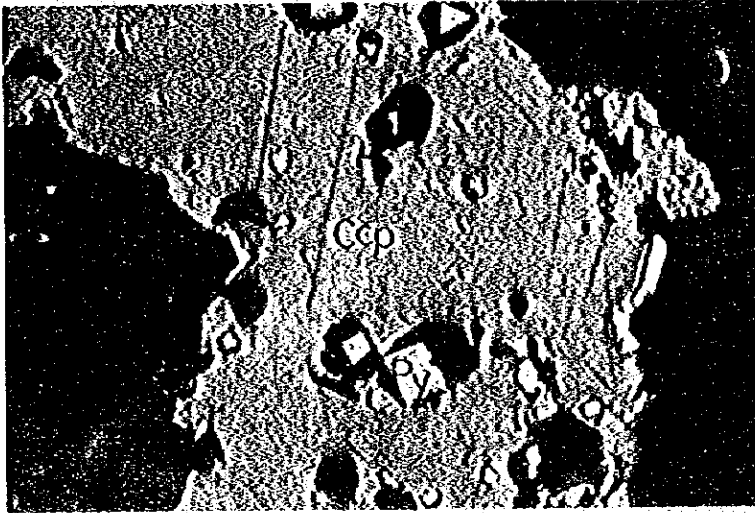
Sample No. : 430.  
Disseminated pyrite and  
chalcopyrite  
Country rock : Granite  
porphyry  
Location : 6-j

Py : pyrite  
Ccp : chalcopyrite

Scale 0 0.5 mm

Open nicol

(25)



Sample No. : 453.

Disseminated copper ore

Country rock : Monzonite

Location : 7-j

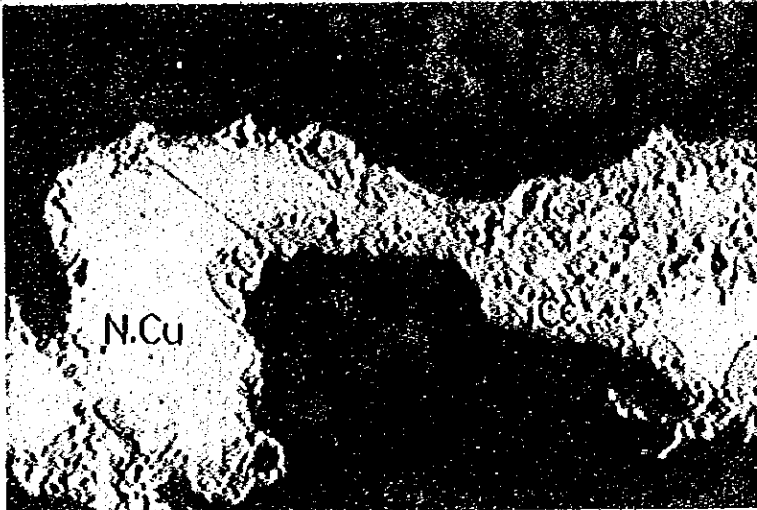
Cop : chalcopyrite

Py : pyrite

Scale 0 0.2 mm

Open nicol

(26)



Sample No. : 469.

Secondary enrichment ore

Country rock : Garnet skarn

Location : 7-i

N.Cu : Native copper

Co : chalcocite

Scale 0 0.2 mm

Open nicol

Table I-10 Chemical Analysis of Rocks

No.	142	260	21	453-(7)	246	40	25
Rock Name	Rhyolite	Massive tuff	Trachyte	Porphyritic monzonite	Porphyritic trachyte	Trachyte	Trachyte
Locality	5-a	7-g	1-d	7-j	7-b	1-g	1-d
SiO <sub>2</sub>	78.06	68.96	67.02	65.12	64.90	64.81	64.74
TiO <sub>2</sub>	0.21	0.40	0.64	0.17	0.72	0.88	0.73
Al <sub>2</sub> O <sub>3</sub>	12.49	16.02	16.76	18.16	16.82	16.36	16.24
Fe <sub>2</sub> O <sub>3</sub>	0.77	2.01	2.59	0.43	3.10	2.17	2.91
FeO	0.09	0.25	0.37	0.77	0.49	0.65	0.43
MnO	0.06	0.07	0.03	0.04	0.04	0.02	0.06
MgO	0.08	0.40	0.36	0.36	0.40	0.72	0.82
CaO	0.18	2.01	1.16	2.56	2.90	2.06	2.04
Na <sub>2</sub> O	3.03	4.12	5.84	5.82	4.38	3.49	5.62
K <sub>2</sub> O	3.79	4.84	4.62	2.83	3.83	4.20	4.24
P <sub>2</sub> O <sub>5</sub>	0.01	0.08	0.07	2.16	0.27	0.29	0.19
H <sub>2</sub> O (+)	0.92	0.97	0.54	1.03	1.78	3.19	0.89
H <sub>2</sub> O (-)	0.41	0.08	0.50	0.22	0.53	0.74	0.39
Total	100.10	100.21	100.50	99.67	100.16	99.58	99.30
MgO	1.0	3.5	2.7	3.5	3.4	6.5	6.0
FeO	10.2	18.0	20.0	11.4	27.6	23.6	22.2
(Na,K) <sub>2</sub> O	88.8	78.5	77.3	85.1	69.0	69.9	71.8
Q	45.60	22.32	12.66	14.58	18.66	23.88	11.16
C	3.16	0.82	0.31	1.43	0.92	3.16	
or	22.24	28.36	27.24	16.68	22.80	25.02	25.02
ab	25.68	34.58	49.26	49.27	37.20	29.34	47.68
an	0.56	8.90	5.00	11.12	12.23	7.78	6.39
lc							
ne							
Sal. total	(97.24)	(94.98)	(94.47)	(93.08)	(91.81)	(89.18)	(90.25)
ac							0.93
wo							2.10
cn	0.20	1.00	0.90	0.90	1.00	1.80	
fs				0.92			
fo							
fa							
mt				0.70			
hm	0.80	2.08	2.56		3.04	2.24	2.88
il	0.30	0.61	0.76	0.30	1.22	1.37	1.06
ap		0.34		0.67	0.67	0.67	0.34
tl	0.20	0.20	0.59		0.20	0.39	0.39
Fem. total	( 1.50)	( 4.23)	( 4.81)	( 3.49)	( 6.13)	( 6.47)	( 7.70)
Or	45.9	39.5	33.4	21.6	31.6	40.3	31.6
Ab	53.0	48.1	60.5	63.9	51.5	47.2	60.3
An	1.1	12.4	6.1	14.5	16.9	12.5	8.1
D. I.	93.52	85.26	89.16	80.53	78.66	78.24	83.86

No.	302	453-(6)	101	62	69	395	289
Rock Name	Porphyritic	Monzonite	Trachy-	Trachy-	Trachyte	Sandy tuff	Trachyte
Locality	1-b	7-f	3-c	2-d	2-d	5-i	1-h
SiO <sub>2</sub>	63.82	62.23	62.16	62.14	61.91	61.81	61.74
TiO <sub>2</sub>	0.96	0.56	1.24	0.79	0.97	0.17	1.01
Al <sub>2</sub> O <sub>3</sub>	14.96	17.72	15.61	16.68	15.55	14.84	16.76
Fe <sub>2</sub> O <sub>3</sub>	5.56	0.98	6.06	3.90	4.64	1.31	3.76
FeO	0.16	0.85	0.22	0.67	0.56	0.10	0.26
MnO	0.03	0.08	0.03	0.04	0.05	0.04	0.03
MgO	1.00	0.49	0.30	2.15	1.87	0.21	0.38
CaO	2.49	2.71	3.10	3.57	4.58	0.90	4.04
Na <sub>2</sub> O	3.78	2.94	5.16	5.61	5.58	3.28	5.71
K <sub>2</sub> O	3.89	5.38	3.27	3.30	3.42	6.15	3.96
P <sub>2</sub> O <sub>5</sub>	0.20	3.79	0.09	0.13	0.18	0.01	0.10
H <sub>2</sub> O (+)	1.90	1.74	1.19	0.92	0.80	3.26	0.98
H <sub>2</sub> O (-)	0.55	0.13	0.77	0.68	0.06	8.05	0.51
Total	99.30	99.60	99.23	100.58	100.17	100.13	99.24
MgO	7.2	4.7	2.1	14.1	12.0	1.9	2.8
FeO	37.3	16.4	39.4	27.4	30.4	11.7	26.6
(Na, K) <sub>2</sub> O	55.5	78.9	58.5	58.5	57.6	86.4	70.6
Q	21.30	18.66	13.98	7.92	7.44	17.10	6.96
C	1.43	2.55				1.12	
or	22.80	31.69	19.46	19.46	20.02	36.14	23.35
ab	31.96	24.63	43.49	47.16	47.16	27.77	48.21
an	8.62	12.51	9.73	10.84	7.23	4.45	8.34
le							
ne							
Sal. total	(86.11)	(90.01)	(86.66)	(85.38)	(81.85)	(86.58)	(86.86)
ac							
wo			0.46	2.55	5.80		3.48
en	2.50	1.20	0.80	5.40	4.70	0.50	1.00
fs							
fo							
fa		1.32					
mt							
hm	5.60		6.08	3.84	4.64	1.28	3.84
il	0.30	1.06	0.46	1.52	1.37	0.30	0.61
ap	0.34	0.34	0.34	0.34	0.34		0.34
tl	1.96		2.55		0.59		1.76
Fem. total	(10.70)	( 3.92)	(10.69)	(13.65)	(17.44)	( 2.08)	(11.03)
Or	36.0	46.0	26.8	25.1	26.9	52.9	29.2
Ab	50.4	35.8	59.8	60.9	63.4	40.6	60.3
An	13.6	18.2	13.4	14.0	9.7	6.5	10.5
D. I.	76.06	74.98	76.93	74.54	74.62	81.01	78.52



No. Rock Name Locality	125 Trachy andesite 4-d	61 Porphyritic trachyte 2-d	83 Trachyte 2-e	79 Trachyte 2-e	148 Trachy andesite 5-b	7 Granodiorite 1-b	243 Trachy andesite 7-b
SiO <sub>2</sub>	61.28	61.17	61.03	60.97	60.78	60.76	60.34
TiO <sub>2</sub>	1.15	1.22	1.18	1.04	1.13	1.11	0.77
Al <sub>2</sub> O <sub>3</sub>	14.53	14.93	16.07	16.42	15.50	14.50	17.93
Fe <sub>2</sub> O <sub>3</sub>	7.87	5.62	5.11	2.84	5.95	2.32	6.07
FeO	0.25	0.46	1.03	2.05	0.57	2.56	0.05
MnO	0.08	0.06	0.06	0.10	0.08	0.07	0.65
MgO	0.75	2.13	1.52	2.61	1.63	1.43	0.49
CaO	5.38	2.95	3.74	4.13	4.57	7.84	4.20
Na <sub>2</sub> O	4.20	4.05	4.63	4.18	4.76	5.01	4.67
K <sub>2</sub> O	2.19	3.05	3.44	4.36	2.92	3.22	3.03
P <sub>2</sub> O <sub>5</sub>	0.55	0.08	0.44	0.35	0.19	0.54	0.20
H <sub>2</sub> O (+)	1.01	2.89	1.26	0.79	1.17	0.72	1.48
H <sub>2</sub> O (-)	0.33	0.52	0.32	0.42	0.19	0.36	0.30
Total	99.57	99.43	99.83	100.26	99.44	100.44	100.18
MgO	5.2	14.5	10.0	16.6	10.7	10.0	3.6
FeO	50.7	37.4	37.0	29.2	38.9	32.5	40.2
(Na, K) <sub>2</sub> O	44.1	48.1	53.0	51.2	50.4	57.5	56.2
Q	19.32	17.58	12.24	9.48	12.06	7.50	12.66
C		0.71					
or	12.79	17.79	20.57	25.58	17.24	18.90	17.79
ab	35.63	34.06	39.30	35.11	40.35	42.44	39.30
an	14.18	11.68	12.79	13.34	12.23	7.51	19.18
lc							
ne							
Sal. total	(81.92)	(81.82)	(84.90)	(83.51)	(81.88)	(76.35)	(88.93)
ac							
wo	2.55		1.28	2.24	3.48	11.60	0.35
en	1.90	5.30	3.80	6.50	4.10	3.60	1.20
fs						1.06	
fo							
fa							
mt				3.71		3.48	
hm	7.84	5.60	5.12	0.32	5.92		6.08
il	0.61	1.06	2.28	1.98	1.37	2.13	1.52
ap	1.34	0.34	1.01	0.67	0.34	1.34	0.34
ti	1.96	1.57			0.98		
Fem. total	(16.20)	(13.87)	(13.49)	(15.42)	(16.19)	(23.21)	(9.49)
Or	20.4	28.0	28.3	34.6	24.7	27.5	23.3
Ab	56.9	53.6	54.1	47.4	57.8	61.6	51.5
An	22.7	18.4	17.6	18.0	17.5	10.9	25.2
D.I.	67.74	69.43	72.11	70.17	69.65	68.84	69.75

No.	22	376	19	51	87	9	203
Rock Name	Trachyte	Granodiorite	Quartz diorite	Trachy andesite	Porphyritic trachyte	Quartz diorite	Trachy andesite
Locality	1-d	4-h	1-d	2-b	2-g	1-b	6-b
SiO <sub>2</sub>	59.97	59.87	59.48	59.28	59.08	58.46	58.40
TiO <sub>2</sub>	1.02	0.86	0.81	0.99	0.94	0.63	0.96
Al <sub>2</sub> O <sub>3</sub>	14.58	16.25	16.02	17.83	17.43	17.81	16.32
Fe <sub>2</sub> O <sub>3</sub>	7.02	2.35	4.14	6.16	5.06	2.56	6.63
FeO	0.52	4.63	3.43	0.29	1.20	4.30	0.65
MnO	0.10	0.13	0.16	0.03	0.06	0.14	0.05
MgO	1.31	2.74	2.44	0.50	1.19	2.73	0.78
CaO	3.55	5.74	7.48	1.56	3.26	5.95	6.06
Na <sub>2</sub> O	5.86	3.64	3.99	4.91	4.06	3.32	4.53
K <sub>2</sub> O	3.58	2.26	1.31	4.66	3.71	1.73	2.72
P <sub>2</sub> O <sub>5</sub>	0.42	0.11	0.14	0.15	0.23	0.21	0.28
H <sub>2</sub> O (+)	0.82	1.55	0.44	2.02	1.47	1.29	1.51
H <sub>2</sub> O (-)	1.24	0.02	0.13	0.80	1.93	0.39	0.41
Total	99.99	100.15	99.97	99.18	99.60	99.52	99.30
MgO	7.4	17.8	16.4	3.1	8.1	19.0	5.3
FeO	38.9	43.9	48.0	36.7	39.1	45.9	45.2
(Na, K) <sub>2</sub> O	53.7	38.3	35.6	60.2	52.8	35.1	49.5
Q	6.36	12.90	14.28	9.54	13.26	13.80	10.92
C				2.96	1.22		
or	21.13	13.34	7.78	27.80	21.68	10.01	16.12
ab	49.78	30.92	33.54	41.40	34.06	28.30	38.25
an	2.78	21.13	21.96	4.73	15.29	28.63	16.12
lc							
ne							
Sal. total	(60.05)	(78.29)	(77.56)	(86.43)	(85.51)	(80.74)	(81.41)
ac							
wo	4.41	2.74	6.03				4.76
en	3.30	6.90	6.10	1.30	3.00	6.80	2.00
fs		5.28	1.85			5.02	
fo							
fa							
mt		3.48	6.03		1.39	3.71	
hm	7.04			6.24	4.16		6.56
il	1.22	1.67	1.52	0.61	1.82	1.23	1.52
ap	1.01	0.34	0.34	0.34	0.34	0.34	0.67
ti	0.98			1.57			0.39
Fem. total	(17.96)	(20.41)	(21.87)	(10.06)	(10.71)	(17.10)	(15.90)
Or	28.7	20.4	12.3	37.6	30.5	15.0	22.9
Ab	67.5	47.3	53.0	56.0	48.0	42.3	54.3
An	3.8	32.3	34.7	6.4	21.5	42.7	22.8
D. I.	77.27	57.16	55.60	78.74	69.00	52.11	65.29

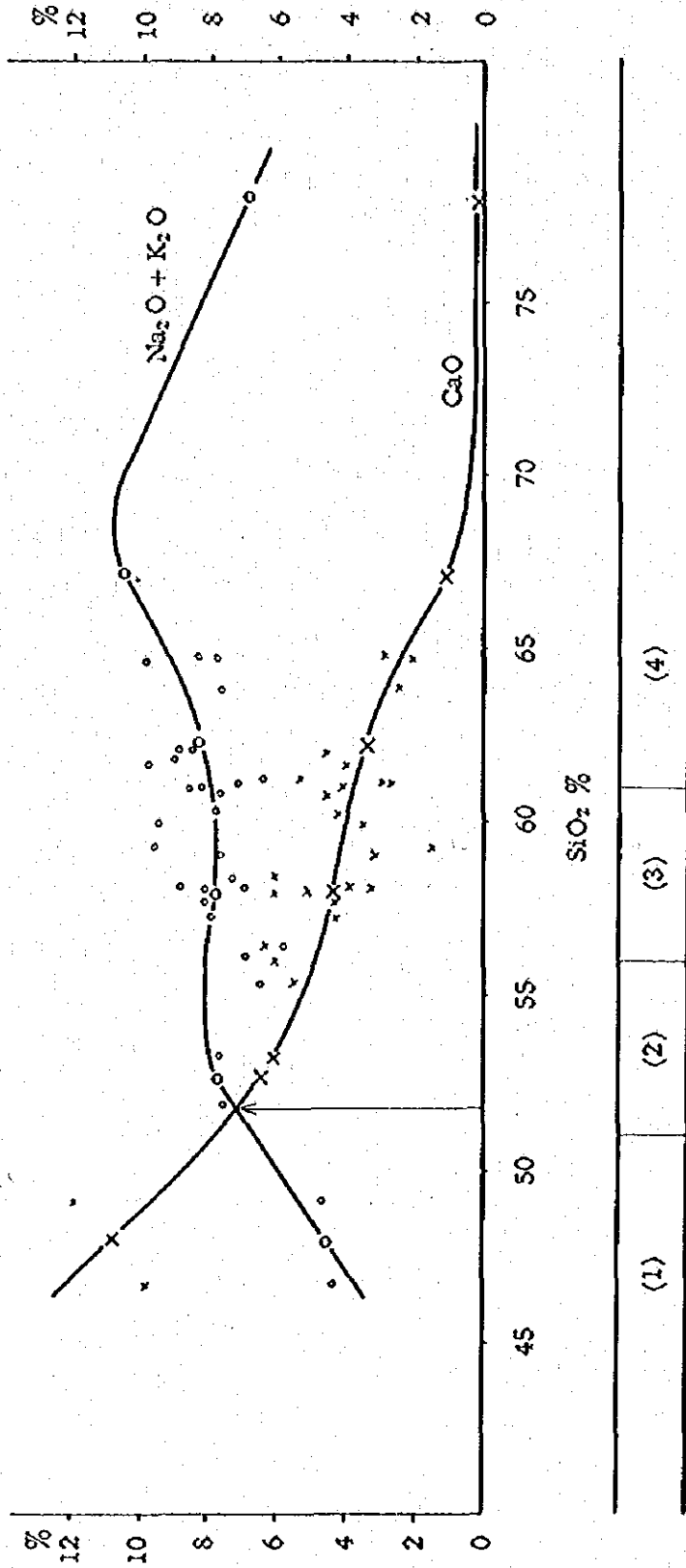
No.	253	287	72	66	293	328	351
Rock Name	Ducite	Trachy andesite	Trachy andesite	Trachy andesite	Trachy andesite	Trachy andesite	Microdiorite
Locality	7-c	1-g	2-d	2-d	1-h	2-h	3-h
SiO <sub>2</sub>	58.14	58.11	58.05	57.92	57.75	57.34	56.66
TiO <sub>2</sub>	1.03	1.08	1.20	1.30	1.25	1.10	0.70
Al <sub>2</sub> O <sub>3</sub>	18.07	17.66	15.97	14.99	16.82	18.77	16.06
Fe <sub>2</sub> O <sub>3</sub>	4.23	7.12	5.12	6.15	6.98	5.53	5.02
FeO	1.15	0.29	1.41	0.69	1.04	0.87	3.83
MnO	0.07	0.03	0.09	0.06	0.09	0.06	0.14
MgO	1.43	0.61	2.54	2.40	1.57	2.00	3.10
CaO	3.22	3.83	5.19	6.11	4.39	4.42	8.18
Na <sub>2</sub> O	3.29	5.04	4.98	5.14	4.99	5.01	3.94
K <sub>2</sub> O	3.59	3.79	3.10	2.54	3.05	2.91	0.90
P <sub>2</sub> O <sub>5</sub>	0.20	0.17	0.61	0.68	0.49	0.50	0.15
H <sub>2</sub> O (+)	3.68	1.28	0.72	1.10	1.00	0.96	0.41
H <sub>2</sub> O (-)	1.51	1.12	0.72	0.63	0.11	0.64	0.11
Total	99.61	100.13	99.70	99.71	99.53	100.11	99.20
MgO	10.8	3.8	15.3	14.7	9.3	12.7	19.0
FeO	37.4	41.5	35.2	38.2	43.2	37.1	51.3
(Na,K) <sub>2</sub> O	51.8	54.7	48.5	47.1	47.5	50.2	29.7
Q	16.62	6.66	6.12	6.96	7.86	6.18	10.86
C	3.16					0.71	
or	21.13	22.24	18.35	15.01	17.79	17.24	5.56
ab	27.77	42.44	41.92	43.49	41.92	42.44	33.54
an	15.29	14.46	12.23	10.29	14.73	18.07	23.07
lc							
ne							
Sal. total	(83.97)	(85.80)	(78.62)	(75.75)	(82.30)	(84.64)	(73.03)
ac							
wo		0.35	4.18	5.80	1.62		6.96
en	3.60	1.50	6.40	6.00	3.90	5.00	7.80
fs							1.98
fo							
fa							
mt	0.93		1.39				7.19
hm	3.52	7.20	4.16	6.08	7.04	5.60	
il	1.98	0.61	2.28	1.67	2.28	1.98	1.37
ap	0.34	0.34	1.34	1.68	1.01	1.34	0.34
ti		1.96		0.98	0.20	0.20	
Fem. total	(10.37)	(11.96)	(19.75)	(22.21)	(16.05)	(14.12)	(25.64)
Or	32.9	28.1	25.3	21.8	23.9	22.2	8.9
Ab	43.3	53.6	57.8	63.2	56.3	54.6	54.0
An	23.8	18.3	16.9	15.0	19.8	23.2	37.1
D. I.	65.52	71.34	66.39	65.46	67.57	65.86	49.96

No.	4	442	344	296	31	75	351
Rock Name	Granodiorite	Basalt	Basalt	Altered basalt	Basalt	Trachy- basalt	Diorite porphyrite
Locality	1-b	7-h	3-h	1-h	2-1	2-d	3-h
SiO <sub>2</sub>	56.59	56.44	56.16	55.45	53.45	53.22	52.89
TiO <sub>2</sub>	0.75	1.30	1.69	1.33	1.56	1.71	0.91
Al <sub>2</sub> O <sub>3</sub>	17.26	15.30	13.99	17.85	17.18	17.34	18.70
Fe <sub>2</sub> O <sub>3</sub>	4.72	7.96	9.59	5.99	9.50	8.74	5.25
FeO	2.20	0.71	0.97	0.55	1.33	0.05	4.17
MnO	0.07	0.04	0.04	0.21	0.22	0.17	0.09
MgO	2.73	2.23	1.05	0.32	2.44	1.74	3.69
CaO	7.05	6.35	6.02	5.51	5.16	6.05	5.90
Na <sub>2</sub> O	4.78	3.98	4.69	5.28	3.97	5.00	3.85
K <sub>2</sub> O	0.45	1.74	2.15	1.20	1.82	2.72	2.10
P <sub>2</sub> O <sub>5</sub>	0.12	0.16	0.14	0.75	1.80	0.45	0.11
H <sub>2</sub> O (+)	2.20	1.77	1.29	5.05	1.03	1.93	1.24
H <sub>2</sub> O (-)	0.24	1.22	1.50	0.46	0.22	0.45	0.35
Total	99.16	99.20	99.28	99.95	99.71	99.57	99.25
MgO	18.9	14.1	6.0	2.5	13.5	10.0	19.9
FeO	44.8	49.7	54.9	46.6	54.6	45.6	48.0
(Na,K) <sub>2</sub> O	36.3	36.2	39.1	50.9	31.9	44.4	32.1
Q	10.38	12.60	10.38	10.32	9.66	1.50	4.20
C				0.20			
or	2.78	10.56	12.79	7.23	10.56	16.42	12.23
ab	40.35	33.54	39.82	44.54	33.54	42.44	32.49
an	24.19	18.63	10.56	20.85	23.63	16.68	27.52
lc							
ne							
Ssl. total	(77.70)	(75.33)	(73.55)	(83.14)	(77.39)	(76.74)	(76.44)
ac							
wo	4.18	4.41	6.96		0.12	2.32	0.35
en	6.80	5.60	2.60	0.80	6.10	4.40	9.20
fs							1.98
fo							
fa							
mt	5.34				0.23		
hm	1.12	8.00	9.60	5.92	9.28	8.80	7.66
il	1.37	1.67	2.13	1.67	3.04	0.46	1.67
ap	0.34	0.34	0.34	1.68	0.67	1.01	0.34
tl		0.98	1.37	1.18		3.53	
Fem. total	(19.15)	(21.00)	(23.00)	(11.25)	(19.44)	(20.52)	(21.02)
Or	4.1	16.8	20.3	10.0	15.6	21.4	16.9
Ab	60.0	53.5	63.0	61.3	49.5	56.4	45.0
An	35.9	29.7	16.7	28.7	34.9	22.2	38.1
D. I.	53.51	56.70	62.99	62.09	53.76	60.06	48.92

No.	349	74	446	455	58		
Rock Name	Diorite	Trachy- basalt	Basalt	Gabbro	Basalt		
Locality	3-h	2-d	7-1	7-k	2-d		
SiO <sub>2</sub>	52.11	51.90	49.01	46.76	46.61		
TiO <sub>2</sub>	1.40	1.81	1.01	1.18	1.39		
Al <sub>2</sub> O <sub>3</sub>	17.17	17.39	13.59	19.56	15.68		
Fe <sub>2</sub> O <sub>3</sub>	2.83	7.15	2.25	5.18	9.74		
FeO	8.06	2.25	6.51	6.73	1.86		
MnO	0.19	0.12	0.17	0.16	0.19		
MgO	3.74	3.68	8.41	5.47	3.97		
CaO	7.69	6.83	11.92	10.42	9.90		
Na <sub>2</sub> O	3.23	5.28	2.93	2.20	1.88		
K <sub>2</sub> O	2.75	2.30	1.72	0.53	2.51		
P <sub>2</sub> O <sub>5</sub>	0.31	0.37	0.14	0.22	0.19		
H <sub>2</sub> O (+)	0.99	0.87	1.28	1.28	4.50		
H <sub>2</sub> O (-)	0.02	0.36	0.22	0.19	2.30		
Total	100.49	100.31	99.19	99.88	100.72		
MgO	18.4	18.4	38.9	27.9	20.9		
FeO	52.2	43.6	39.6	58.2	56.0		
(Na,K) <sub>2</sub> O	29.4	38.0	21.5	13.9	23.1		
Q				1.08	3.90		
C							
or	16.12	13.34	10.01	3.34	15.01		
ab	27.25	43.49	24.63	18.34	15.72		
an	23.84	16.96	18.90	41.98	26.97		
lc		0.57					
ne							
Sal. total	(67.21)	(74.36)	(53.54)	(64.74)	(61.60)		
ac	4.99	5.92	16.47	3.25	8.93		
wo	8.60		2.20	13.70	9.90		
en	9.50			6.34			
fs	0.56	6.49	13.25				
fo	0.82		6.73				
fa	4.18	2.32	3.25	7.42	2.78		
mt		5.60			7.84		
hm	2.74	3.50	1.98	2.28	2.58		
il	0.67	1.01	0.34	0.67	0.34		
ap							
ti							
Fem. total	(32.06)	(24.84)	(44.22)	(33.66)	(32.37)		
Or	24.0	18.1	18.7	5.3	26.0		
Ab	40.5	58.9	46.0	28.8	27.3		
An	35.5	23.0	35.3	65.9	46.7		
D. I.	43.37	57.49	34.64	22.76	34.63		

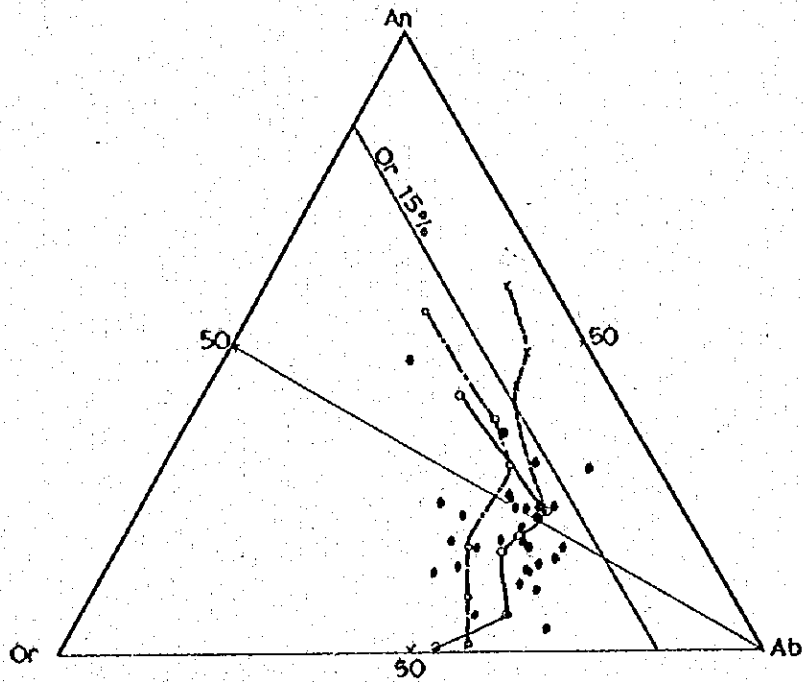
No.	414	415	450	Average	399	419	306
Rock Name	Limestone	Limestone	Limestone	of Ferrobamba	Limestone	Calcarenite	Calcarenite
Locality	6-1	6-1	7-1	limestone	5-m	7-1	1-1
SiO <sub>2</sub>	4.04	1.13	2.25	2.47	1.11	4.22	26.62
TiO <sub>2</sub>	0.02	0.01	0.02	0.02	0.03	0.07	0.00 <sub>4</sub>
Al <sub>2</sub> O <sub>3</sub>	0.32	0.14	0.45	0.30	0.21	1.76	0.21
Fe <sub>2</sub> O <sub>3</sub>	0.14	0.18	0.82	0.38	0.19	0.49	0.13
MnO	0.01	0.01	0.01	0.01	0.02	0.03	0.01
MgO	0.03	0.09	0.04	0.05	0.02	0.04	0.01
CaO	0.05	0.10	0.01	0.05	0.05	0.06	0.09
Na <sub>2</sub> O	0.14	0.00 <sub>4</sub>	0.00 <sub>4</sub>	0.05	0.01	0.12	0.01
K <sub>2</sub> O	0.03	0.03	0.03	0.05	0.19	0.12	0.02
P <sub>2</sub> O <sub>5</sub>	0.07	0.08	0.01	0.05	0.00 <sub>9</sub>	0.04	0.00 <sub>5</sub>
H <sub>2</sub> O (-)	0.04	0.00	0.18	0.07	0.08	0.11	0.10
MnCO <sub>3</sub>	0.00	0.00	0.00	0.00	0.00	0.00	1.15
MgCO <sub>3</sub>	0.51	1.79	4.09	2.13	1.29	0.20	0.85
CaCO <sub>3</sub>	93.62	96.52	92.10	94.41	96.80	92.78	70.80
Total	100.07	100.08	100.01	100.04	100.00	100.04	100.00

Table I-11 Alkali-Lime Index of Volcanic Rocks from the Yauri Area



Rock Series (after M. A. PEACOCK 1931)  
 (1) Alkali (2) Alkali-Calcic (3) Calc-Alkalic (4) Calcic

**Table I-12** Triangular Diagram Showing the Ratio Normative Orthoclase (Or), Albite (Ab) and Anorthite (An) of Volcanic Rocks from the Yauri Area

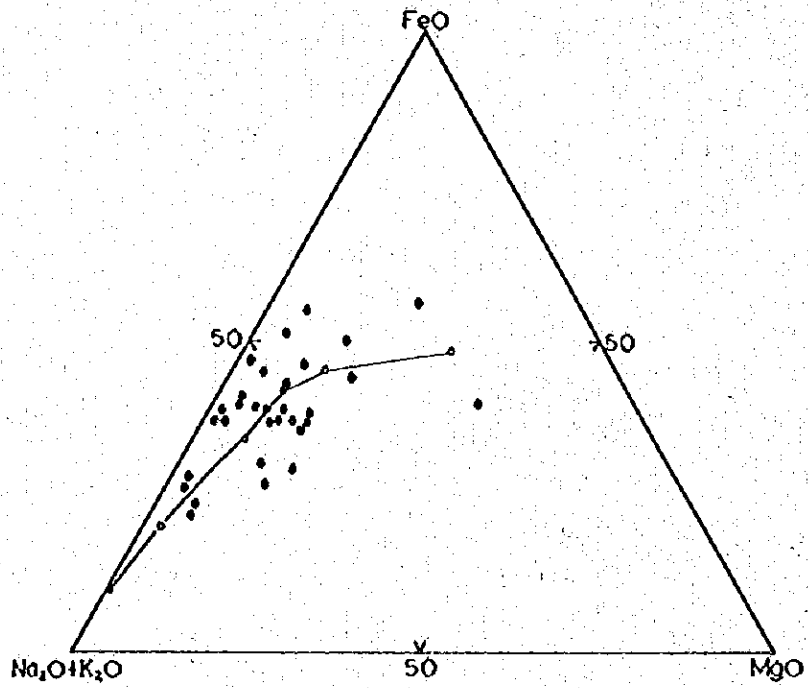


**LEGEND**

- Average ratio of Yauri area
- x--- Izu-Hakone hypersthentic rock series (Japan)
- x--- Circum-Japan Sea alkali rock series (Japan)



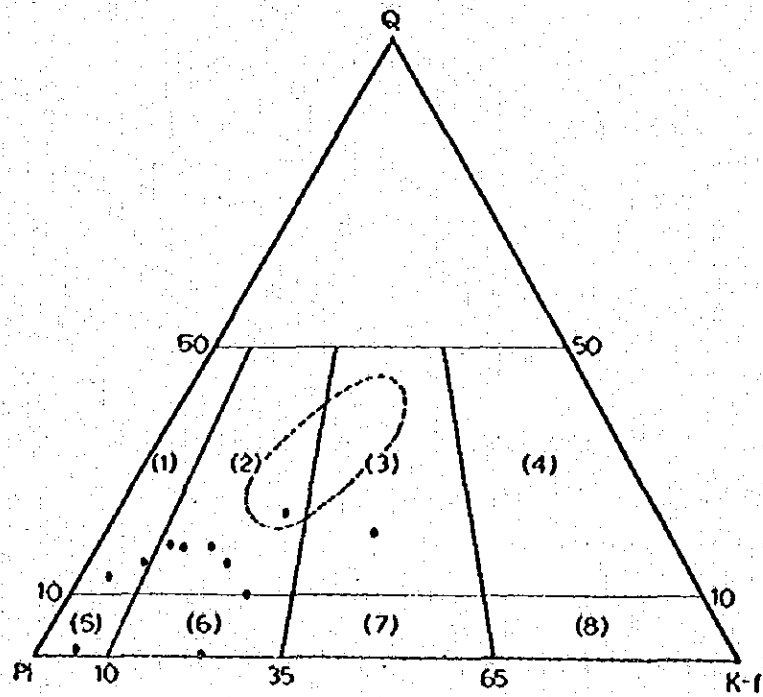
Table 1-13 AFM Diagram of Volcanic Rocks from the Yauri Area



LEGEND

—●— Average ratio of Yauri area

**Table 1-14 Classification of Intrusive Rocks by Normative Quartz and Feldspars**



**LEGEND**

- (1) Quartz diorite
- (2) Granodiorite
- (3) Quartz monzonite
- (4) Granite
- (5) Gabbro
- (6) Diorite
- (7) Monzonite
- (8) Syenite



Monzonitic rock of Southwestern U. S. A.

- Intrusives of Yauri Area

Table I-15 (I) Geochemical Analysis of Stream Sediments from the Yauri Quadrangle

						Cu: ppm Mo: ppm N: Nil		
Sample No.	Cu	Mo	Sample No.	Cu	Mo	Sample No.	Cu	Mo
1	20	N	39	25	N	77	5	N
2	25	N	40	35	N	78	10	N
3	30	N	41	20	N	79	8	N
4	30	N	42	20	N	80	-5	N
5	20	N	43	10	N	81	10	N
6	15	N	44	30	N	82	5	N
7	30	N	45	45	N	83	-5	N
8	20	N	46	30	N	84	40	N
9	15	N	47	20	N	85	30	N
10	15	N	48	15	N	86	30	N
11	20	N	49	25	N	87	25	N
12	20	N	50	35	N	88	20	N
13	20	N	51	10	N	89	50	N
14	30	N	52	20	N	90	30	N
15	20	N	53	20	N	91	10	N
16	25	N	54	10	N	92	5	N
17	10	N	55	20	N	93	30	N
18	15	N	56	30	N	94	80	N
19	30	N	57	30	N	95	20	N
20	20	N	58	30	N	96	20	N
21	15	N	59	30	N	97	20	N
22	30	N	60	8	N	98	20	N
23	20	N	61	20	N	99	10	N
24	15	N	62	20	N	100	10	N
25	20	N	63	20	N	101	75	N
26	20	N	64	10	N	102	60	N
27	30	N	65	10	N	103	30	N
28	20	N	66	10	N	104	30	N
29	40	N	67	15	N	105	30	N
30	40	N	68	20	N	106	30	N
31	30	N	69	30	N	107	20	N
32	30	N	70	30	N	108	15	N
33	30	N	71	-5	N	109	30	N
34	10	N	72	15	N	110	10	N
35	25	N	73	10	N	111	20	N
36	15	N	74	10	N	112	20	N
37	25	N	75	30	N	113	90	N
38	30	N	76	15	N	114	20	N

<u>Sample No.</u>	<u>Cu</u>	<u>Mo</u>	<u>Sample No.</u>	<u>Cu</u>	<u>Mo</u>	<u>Sample No.</u>	<u>Cu</u>	<u>Mo</u>
115	30	N	161	5	N	207	10	N
116	30	N	162	35	N	208	20	N
117	45	N	163	20	N	209	10	N
118	40	N	164	35	N	210	10	N
119	40	N	165	10	N	211	30	N
120	70	N	166	15	N	212	45	N
121	30	N	167	30	N	213	90	N
122	35	N	168	10	N	214	20	N
123	30	N	169	10	N	215	50	N
124	30	N	170	5	N	216	250	N
125	5	N	171	5	N	217	100	N
126	30	N	172	N	N	218	50	N
127	30	N	173	5	N	219	300	N
128	30	N	174	10	N	220	20	N
129	20	N	175	10	N	221	90	N
130	10	N	176	10	N	222	80	N
131	20	N	177	5	N	223	40	N
132	20	N	178	N	N	224	40	N
133	20	N	179	5	N	225	35	N
134	15	N	180	5	N	226	50	N
135	20	N	181	40	N	227	-5	N
136	15	N	182	30	N	228	45	N
137	20	N	183	30	N	229	45	N
138	40	N	184	8	N	230	600	N
139	30	N	185	30	N	231	60	N
140	40	N	186	45	N	232	45	N
141	25	N	187	45	N	233	15	N
142	40	N	188	15	N	234	20	N
143	15	N	189	35	N	235	600	N
144	35	N	190	20	N	236	200	N
145	30	N	191	30	N	237	30	N
146	10	N	192	40	N	238	45	N
147	15	N	193	20	N	239	50	N
148	20	N	194	10	N	240	95	N
149	30	N	195	20	N	241	150	N
150	25	N	196	25	N	242	250	N
151	30	N	197	30	N	243	50	N
152	10	N	198	20	N	244	30	N
153	30	N	199	5	N	245	75	N
154	30	N	200	5	N	246	60	N
155	30	N	201	15	N	247	180	N
156	35	N	202	35	N	248	550	N
157	30	N	203	25	N	249	35	N
158	30	N	204	5	N	250	30	N
159	30	N	205	15	N	251	30	N
160	30	N	206	20	N	252	20	N

<u>Sample No.</u>	<u>Cu</u>	<u>Mo</u>	<u>Sample No.</u>	<u>Cu</u>	<u>Mo</u>
253	30	N	299	20	N
254	15	N	300	25	N
255	20	N	301	20	N
256	30	N	302	35	N
257	30	N	303	25	N
258	20	N	304	30	N
259	25	N	305	8	N
260	25	N	306	5	N
261	20	N	307	20	N
262	35	N	308	20	N
263	15	N	309	20	N
264	150	N	310	8	N
265	110	N	311	10	N
266	80	N	312	20	N
267	100	N	313	20	N
268	30	N	314	15	N
269	30	N	315	20	N
270	20	N	316	30	N
271	30	N	317	35	N
272	20	N	318	30	N
273	15	N	319	40	N
274	45	N			
275	40	N			
276	10	N			
277	30	N			
278	30	N			
279	30	N			
280	15	N			
281	15	N			
282	10	N			
283	20	N			
284	30	N			
285	20	N			
286	20	N			
287	30	N			
288	35	N			
289	25	N			
290	20	N			
291	20	N			
292	10	N			
293	40	N			
294	40	N			
295	20	N			
296	20	N			
297	8	N			
298	20	N			

Table I-15 (2) Geochemical Analysis of Stream Sediments from the Velille Quadrangle

Sample No.	Cu	Mo	Sample No.	Cu	Mo	Sample No.	Cu	Mo
1	30	N	39	35	N	77	30	N
2	10	N	40	25	N	78	15	N
3	30	N	41	20	N	79	30	N
4	35	N	42	30	N	80	85	N
5	15	N	43	30	N	81	-5	N
6	20	N	44	20	N	82	-5	N
7	20	N	45	40	N	83	-5	N
8	30	N	46	10	N	84	20	N
9	40	N	47	20	N	85	8	N
10	45	N	48	30	N	86	-5	N
11	20	N	49	5	N	87	N	N
12	15	N	50	5	N	88	45	N
13	15	N	51	8	N	89	10	N
14	-5	N	52	8	N	90	15	N
15	45	N	53	5	N	91	5	N
16	30	N	54	30	N	92	10	N
17	25	N	55	20	N	93	-5	N
18	30	N	56	10	N	94	-5	N
19	20	N	57	10	N	95	10	N
20	50	N	58	10	N	96	25	N
21	20	N	59	25	N	97	20	N
22	10	N	60	30	N	98	5	N
23	10	N	61	40	N	99	8	N
24	30	N	62	N	N	100	5	N
25	20	N	63	5	N	101	8	N
26	20	N	64	50	N	102	15	N
27	20	N	65	20	N	103	10	N
28	30	N	66	25	N	104	15	N
29	15	N	67	25	N	105	5	N
30	30	N(+)	68	120	N	106	15	N
31	5	N	69	30	N	107	15	N
32	30	N(+)	70	30	N	108	10	N
33	10	N	71	40	N	109	25	N
34	20	N	72	30	N	110	25	N
35	30	N	73	100	N	111	15	N
36	30	N	74	35	N	112	15	N
37	10	N	75	80	N	113	10	N
38	10	N	76	5	N	114	15	N

Sample No.	Cu	Mo	Sample No.	Cu	Mo	Sample No.	Cu	Mo
115	10	N	161	10	N	207	25	N(+)
116	5	N	162	15	N	208	20	N(+)
117	10	N	163	10	N	209	10	N(+)
118	25	N	164	20	N	210	20	N(+)
119	10	N	165	10	N	211	20	N(+)
120	15	N	166	10	N	212	50	N(+)
121	10	N	167	30	N	213	20	N(+)
122	15	N	168	20	N	214	15	N(+)
123	20	N	169	40	N	215	25	N(+)
124	10	N	170	25	N	216	20	N
125	20	N	171	20	N	217	40	N(+)
126	30	N	172	20	N	218	25	N(+)
127	30	N	173	5	N	219	20	N(+)
128	20	N	174	15	N	220	10	N(+)
129	30	N	175	N	N	221	15	N(+)
130	20	N	176	15	N	222	10	N(+)
131	5	N	177	20	N	223	20	N(+)
132	20	N	178	15	N	224	10	N(+)
133	35	N	179	15	N	225	14	N
134	30	N	180	10	N	226	20	N
135	40	N	181	15	N	227	20	N(+)
136	20	N	182	25	N	228	15	N
137	40	N	183	25	N	229	15	N
138	40	N	184	20	N	230	15	N
139	-5	N	185	30	N	231	15	N
140	8	N	186	15	N	232	15	N
141	-5	N	187	10	N	233	10	N
142	10	N	188	15	N	234	5	N
143	20	N	189	25	N	235	5	N
144	20	N	190	-5	N	236	15	N(+)
145	30	N	191	-5	N	237	5	N
146	10	N	192	10	N	238	15	N
147	20	N	193	1000	N	239	20	N
148	20	N	194	20	N	240	15	N
149	15	N	195	10	N	241	5	N
150	10	N	196	25	N	242	5	N
151	10	N	197	5	N	243	15	N
152	20	N	198	25	N	244	15	N
153	15	N	199	10	N	245	20	N
154	15	N	200	15	N	246	15	N
155	25	N	201	20	N(+)	247	10	N
156	30	N	202	15	N(+)	248	15	N
157	15	N	203	8	N(+)	249	15	N
158	20	N	204	20	N(+)	250	100	N
159	15	N	205	15	N(+)	251	10	N
160	10	N	206	25	N(+)	252	10	N

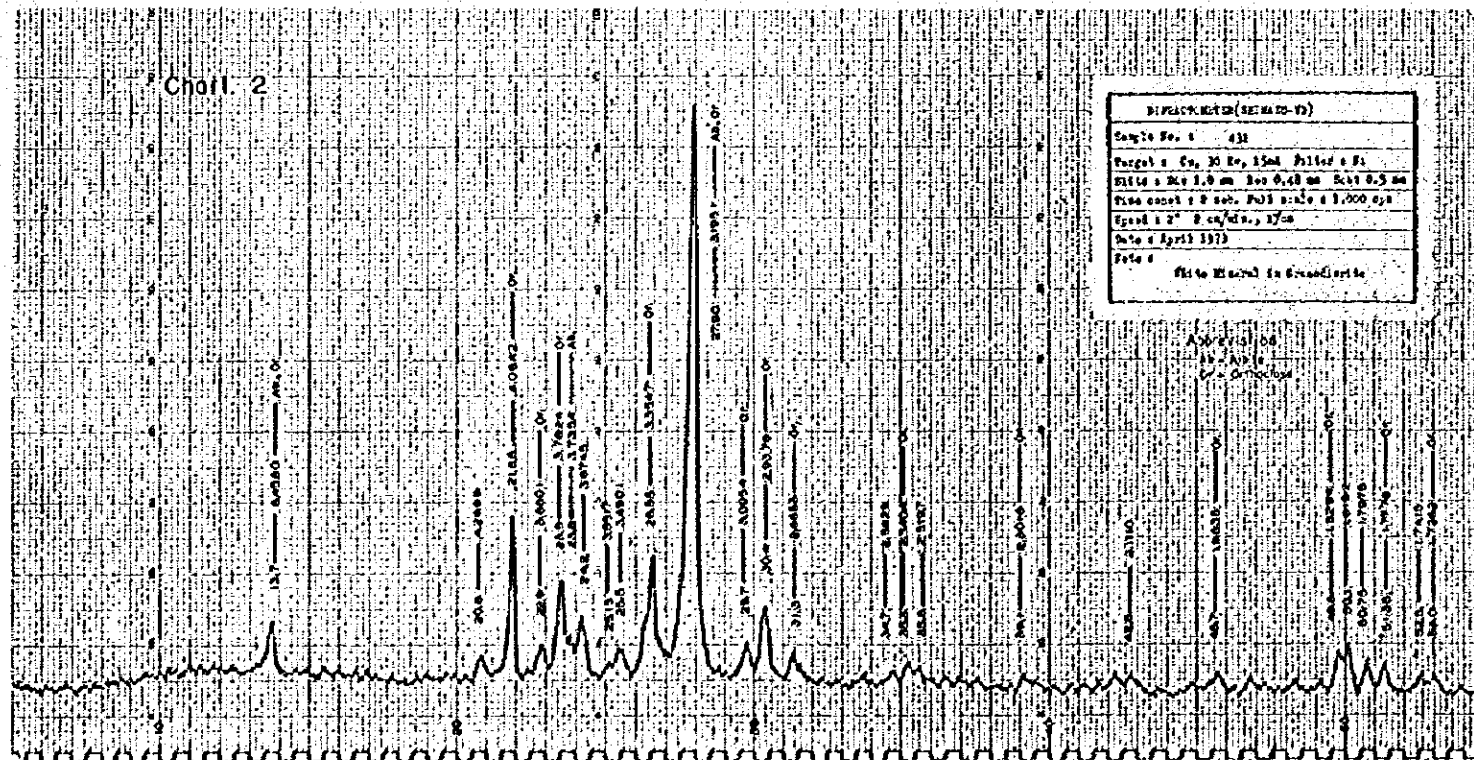
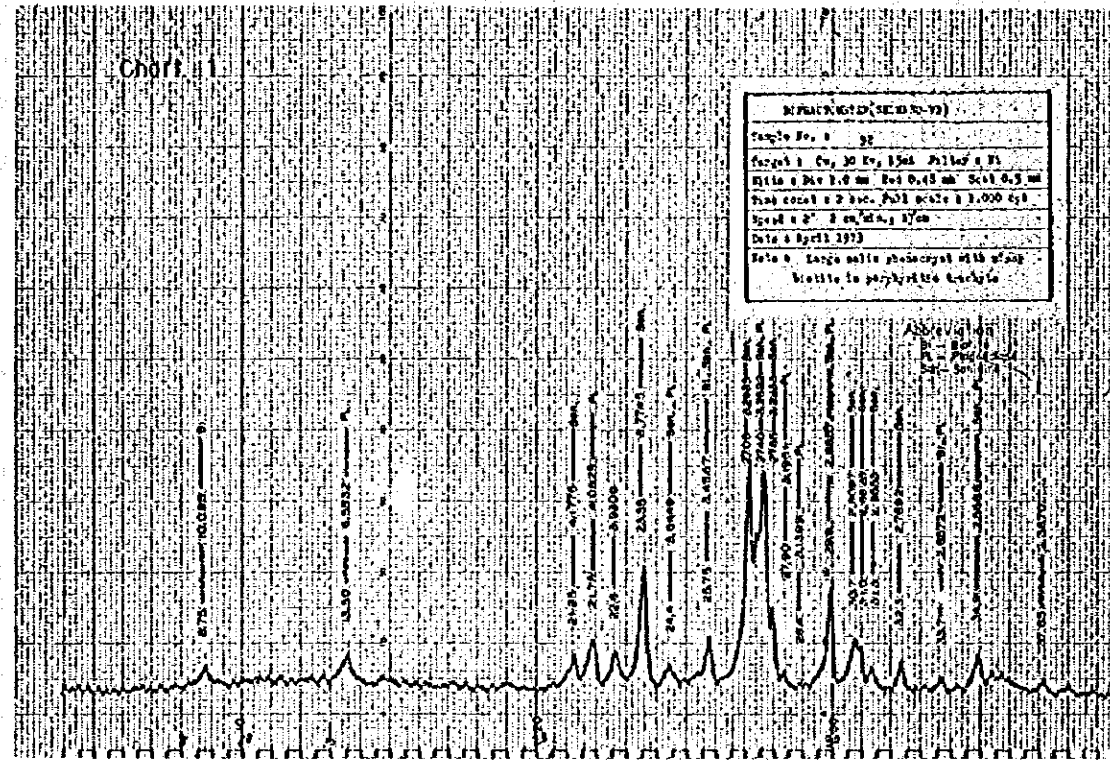
<u>Sample No.</u>	<u>Cu</u>	<u>Mo</u>
253	5	N
254	20	N(+)
255	20	N(+)
256	10	N
257	100	N
258	5	N
259	10	N
260	45	N
261	10	N
262	N	N
263	15	N
264	-5	N
265	15	N
266	20	N
267	15	N(+)
268	15	N(+)
269	15	N
270	20	N(+)
271	5	N(+)
272	10	N(+)
273	10	N(+)
274	25	N(+)
275	15	N
276	10	N
277	15	N
278	50	N
279	25	N
280	10	N
281	5	N
282	N	N
283	35	N
284	15	N
285	-5	N
286	15	N
287	10	N
288	30	N
289	10	N

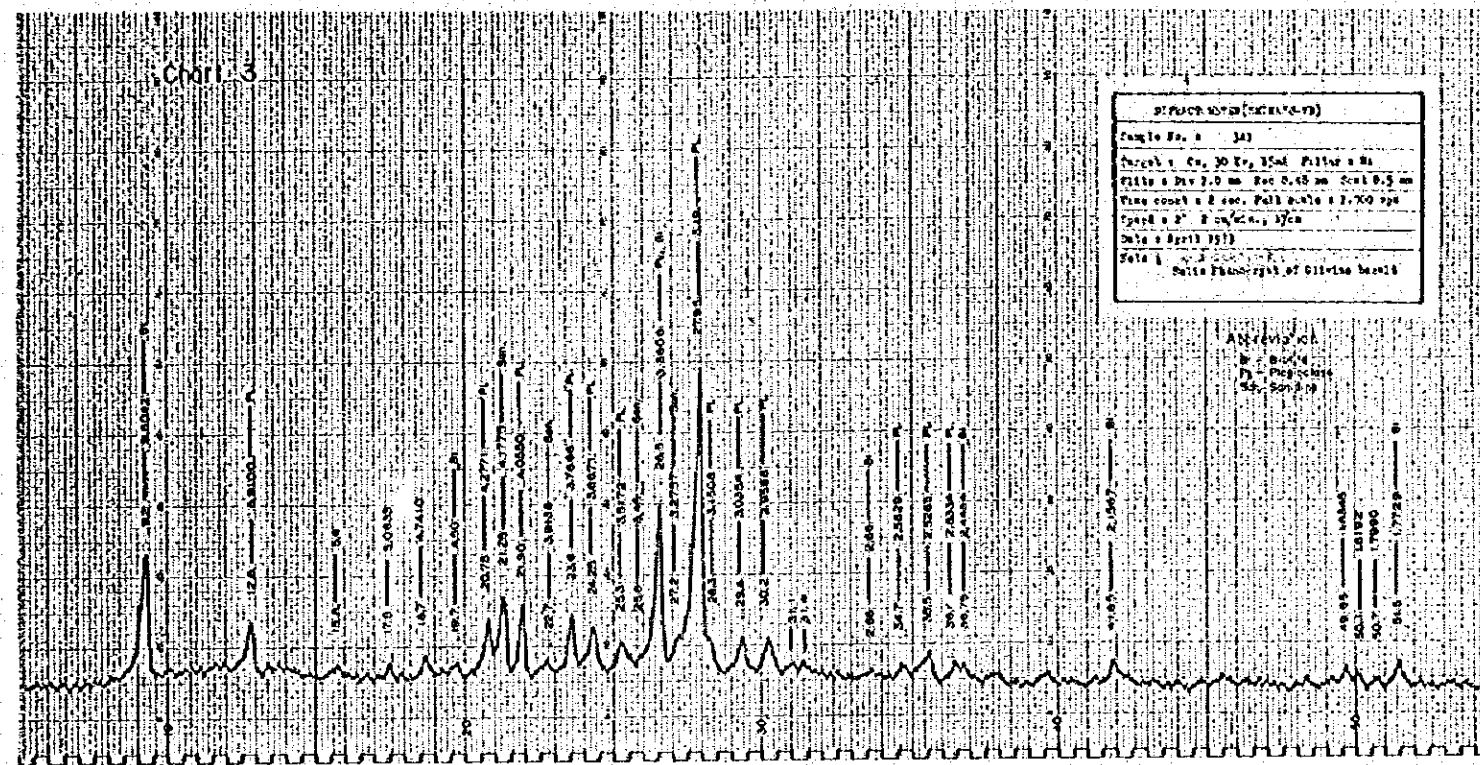


Table I-16 Chemical Analysis of Ores

Sample No.	Location	Total-Cu %	Soluble Cu %	Mo %	Au g/t	Ag g/t	S %	Pb %	Zn %	Sb %	Fe %
176	5 - f	2.62									
231	6 - f									Nil	
277	7 - g				Nil	342					
328	2 - h	0.02		0.004			14.2				
336	2 - i	0.11					4.40	tr	tr		57.4
338	2 - j	0.02		0.004			3.09				
356	3 - h	0.09	0.07	0.004							
378	4 - h	0.02		0.004	Nil						
388	4 - j	0.18	0.18	0.005							
454	7 - j	0.18		0.007							

Table I-17 Chart of X-ray Diffractive Analysis





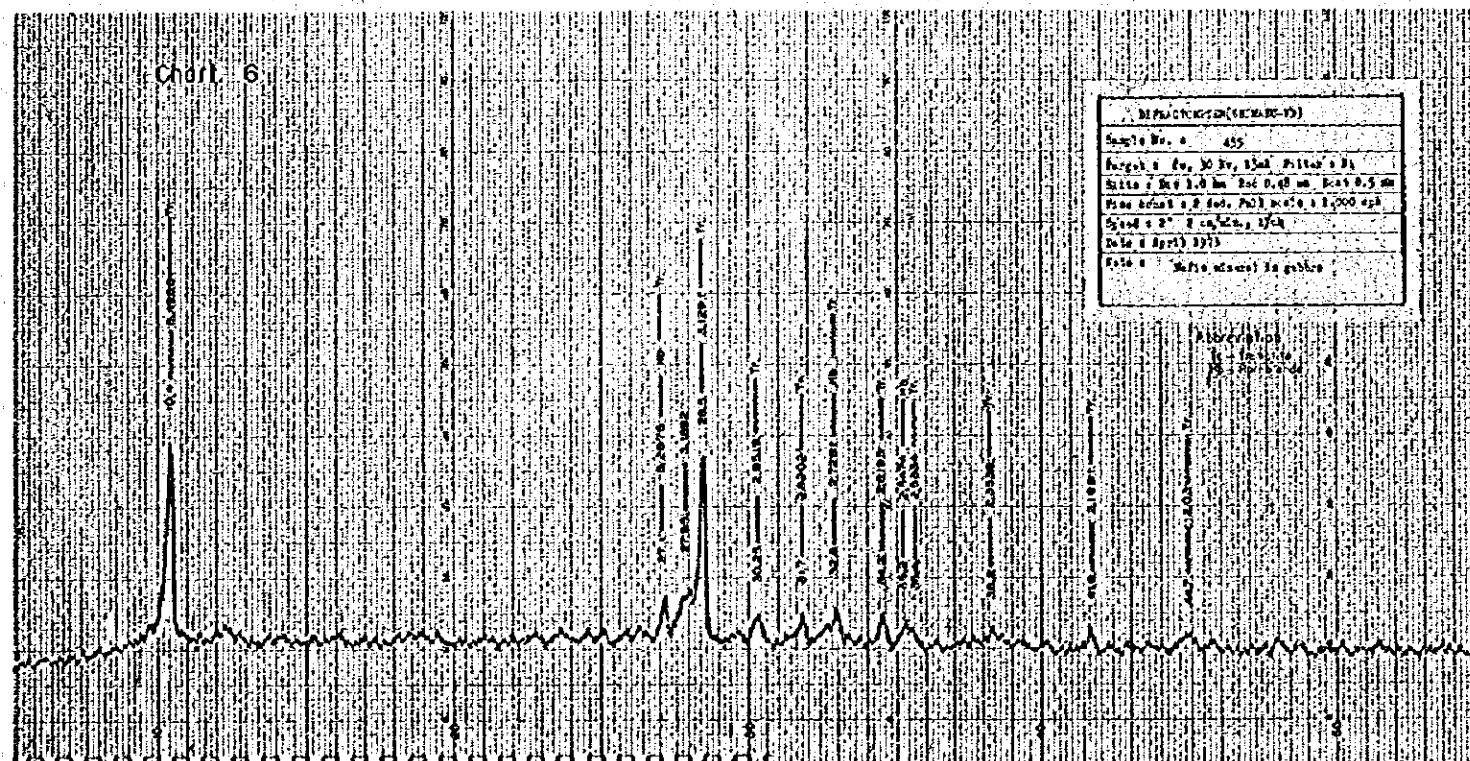
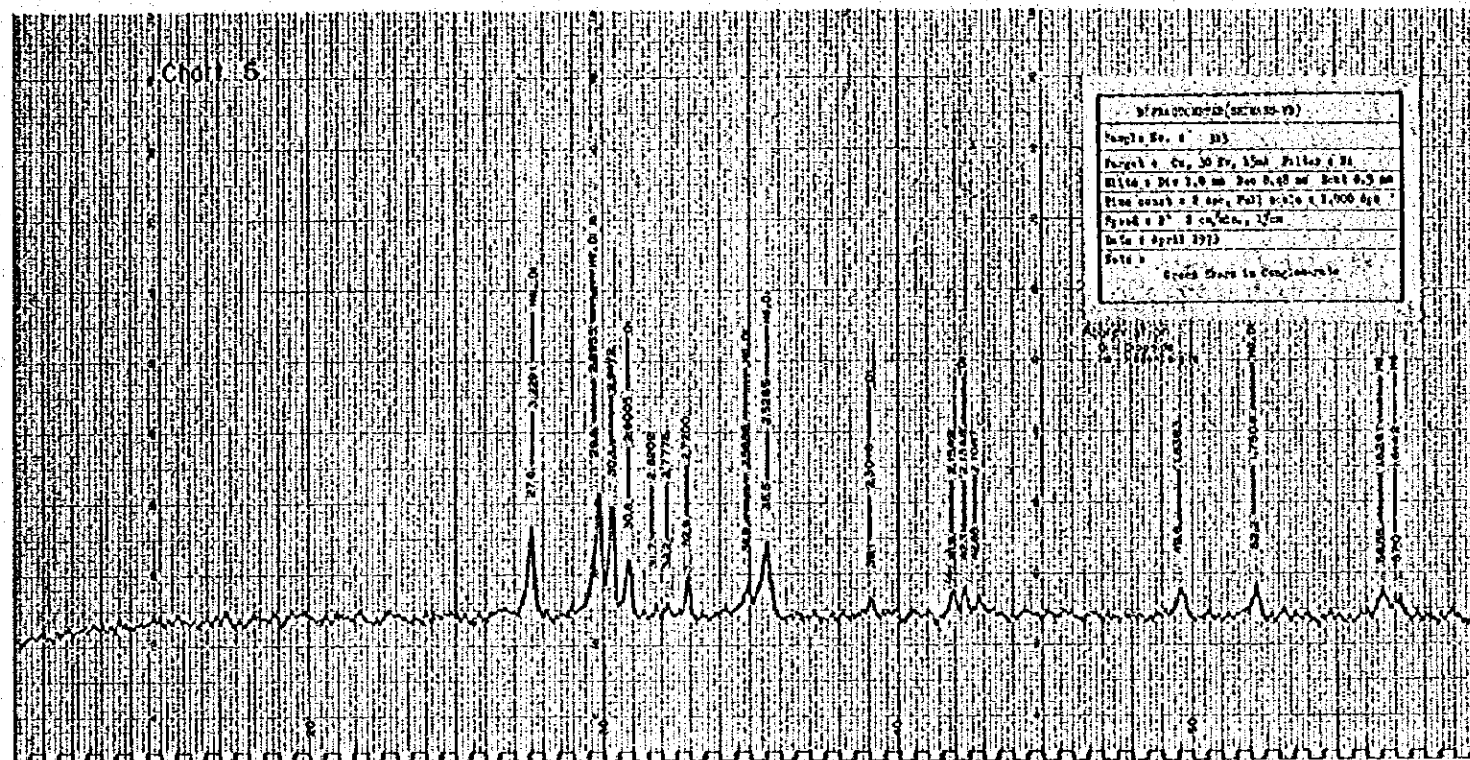
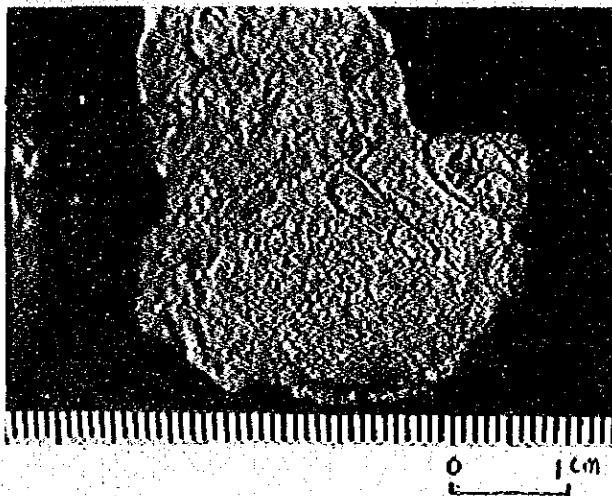


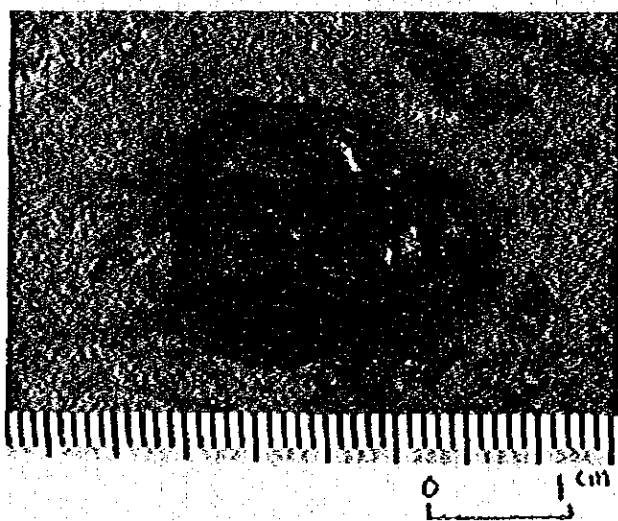
Table I-18 K-Ar Ages of Igneous Rocks from the Yauri Area

Sample No.	Location	Rock Name	Analytical Mineral	$^{36}\text{Ar}^T/^{38}\text{Ar}$	$^{40}\text{Ar}^T/^{38}\text{Ar}$	$^{40}\text{Ar}^R/^{38}\text{Ar}$	$^{40}\text{Ar}^R/^{40}\text{K}$	Air Condition %	Ages $\times 10^9$	Geological Age
280	7 - g	massive tuff	biotite	0.00253	0.73355	0.08322	0.000302	88.37	5	Tertiary
253	7 - c	Dacite	"	0.00280	0.84734	0.11709	0.000381	85.93	7	"
79	2 - c	trachyandesite	whole rock	0.00372	1.63051	0.62794	0.001633	61.36	28	"
453	7 - j	monzonite porphyry	"	0.00047	0.22208	0.13814	0.002155	37.32	37	"
40	1 - g	trachyte	biotite	0.00617	2.01754	0.28977	0.002247	85.53	38	"
87	2 - g	porphyritic trachyte	"	0.00259	1.32072	0.65263	0.002409	50.42	41	"
341	2 - l	olivine basalt	whole rock	0.00523	2.20786	0.75833	0.003282	65.56	55	"
453	7 - j	quartz monzonite	"	0.00498	1.81869	0.44316	0.003350	75.52	57	"
349	3 - b	diorite	biotite	0.00416	2.38833	1.25552	0.004435	47.34	74	Cretaceous
376	4 - b	granodiorite	biotite + hornblende	0.00285	2.17783	1.43278	0.005128	34.11	86	"
9	1 - b	quartz diorite	"	0.00280	2.32771	1.59746	0.006310	31.28	105	"
455	7 - k	gabbro	hornblende	0.00254	1.29040	0.63711	0.008764	50.46	144	Jurassic

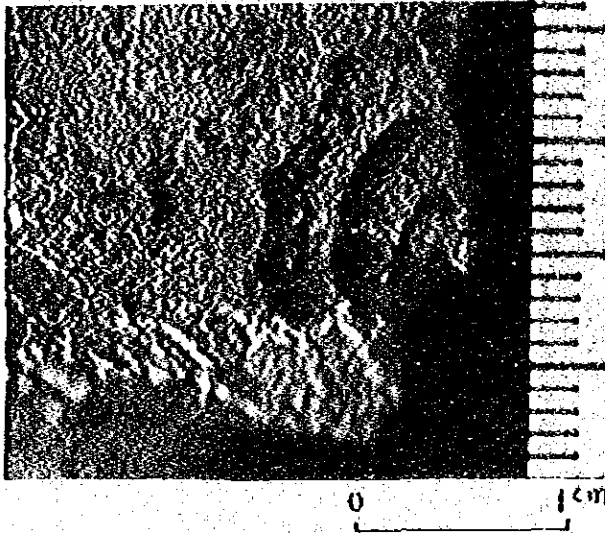
Table I-19 Fossils



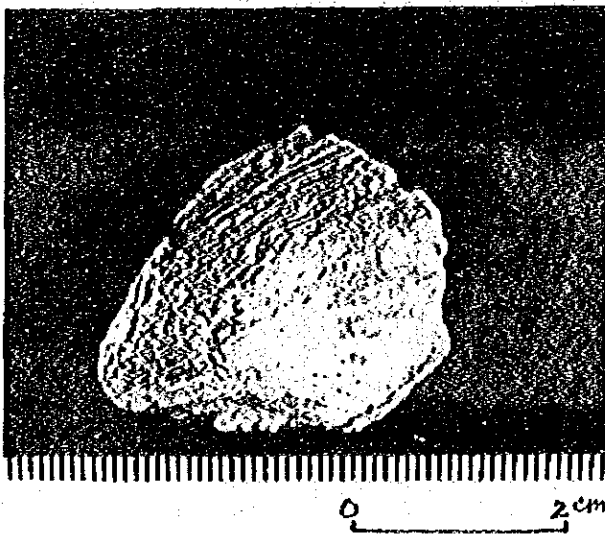
Sample No. : 318.  
Geological formation :  
Ayabacas Formation  
Rock name : Limestone  
Location : 1-m  
Fossil : *Amplina* (?) sp.  
Geological age :  
Triassic to Recent



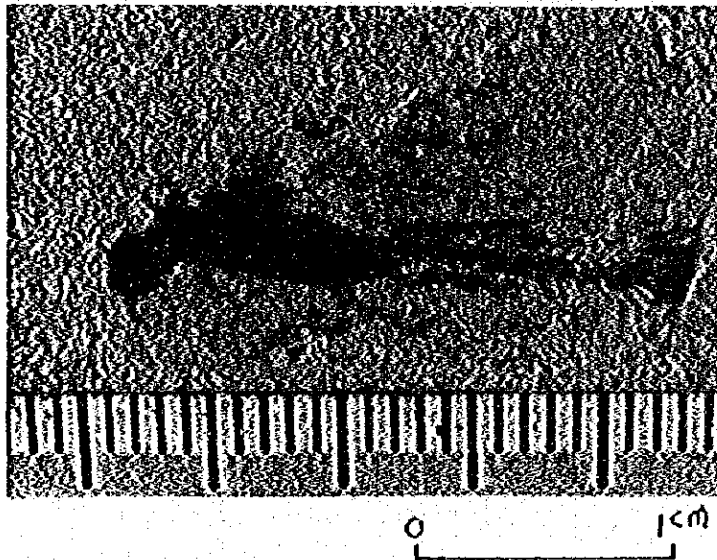
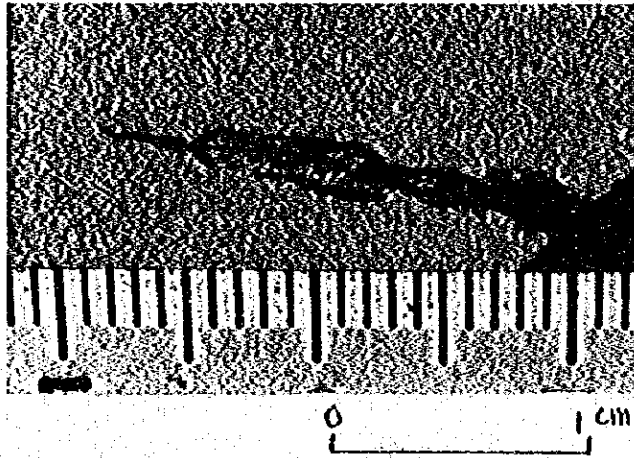
Sample No. : 320.  
Geological formation :  
Ayabacas Formation  
Rock name : Limestone  
Location : 1-m  
Fossil : *Neitea* (s.l.) sp.  
Geological age :  
Jurassic to Cretaceous



Sample No. : 321.  
Geological formation :  
Ayabacas Formation  
Rock name : Limestone  
Location : 1-m  
Fossil : Ampliina (?) sp.  
Geological age :  
Triassic to recent



Sample No. : 397.  
Geological formation :  
Ayabacas Formation  
Rock name : Limestone  
Location : 5-m  
Fossil :  
Aptyxiella (?) sp. (Nerineidae)  
Geological age :  
Jurassic to Cretaceous  
Inhabitable environment :  
Reef coral region of  
sub-tropical sea



Sample No. : 433.  
Geological formation : Yauri Formation  
Rock name : Tuffaceous shale  
Location : 6-k  
Fossil : Class Osteichyes  
Order Cyprinodontiforms  
Family Cyprinodontae or Poeciliidae  
Geological age : Tertiary to Recent  
Inhabitable environment : Fresh and Blackish water



**Table 1-20 Pollen Analysis**

<b>Sample No. :</b>	<b>395</b>
<b>Geological formation:</b>	<b>Descanso Group</b>
<b>Rock name:</b>	<b>Sandy tuff</b>
<b>Location:</b>	<b>5-i</b>
<b>Pollen:</b>	<b>Polylepis incana Compositae Gramineae Botryococcus</b>
<b>Sample No. :</b>	<b>433 - 1</b>
<b>Geological formation:</b>	<b>Yauri Formation</b>
<b>Rock name:</b>	<b>Tuffaceous shale</b>
<b>Location:</b>	<b>6-k</b>
<b>Pollen:</b>	<b>Polylepis incana Compositae Gramineae Botryococcus</b>
<b>Sample No. :</b>	<b>433 - 2</b>
<b>Geological formation:</b>	<b>Yauri Formation</b>
<b>Rock name:</b>	<b>Tuffaceous shale</b>
<b>Location:</b>	<b>6-k</b>
<b>Pollen:</b>	<b>Polylepis incana Compositae Gramineae Botryococcus</b>
<b>Sample No. :</b>	<b>435</b>
<b>Geological formation:</b>	<b>Yauri Formation</b>
<b>Rock name:</b>	<b>Sandstone</b>
<b>Location:</b>	<b>7-h</b>
<b>Pollen:</b>	<b>Polylepis incana Compositae Gramineae Botryococcus</b>

### Discussion of Pollen Analysis

1. All of four samples are practically same in pollen composition and also have a common characteristic of tuffaceous sediments so that pollens are poorly contained not only in amount but in variety.
2. Among pollens *Polylepis incana* is most predominant. Some 30 species of *Polylepis*, a genus of Rosaceae, grow naturally in the present temperate regions of Peru, Bolivia, Nicaragua, etc.
3. As for Compositae (Asterales), 3 different types were detected but the determination of their genera was impossible.
4. Occurrences of Compositae and Gramineae (Graminales) fossils have been reported only from Neogene or younger beds.
5. *Botryococcus*, a genus of Algae, occurs through all ages since Palaeozoic. This Algae is a good indicator for the sedimentary environment of a shallow, stagnant and neutral to alkaline pool or swamp.
6. From the above-stated flora, all beds examined are considered to have deposited under a temperate climate and at a shallow and stagnant basin. The geological age can not be definitely determined due to lacking of sufficient varieties of pollen flora, but judging from the good preservation of pollen fossils and indicated warm climate, most probably, the age is considered as Pliocene epoch.

Table I-21 Photographs

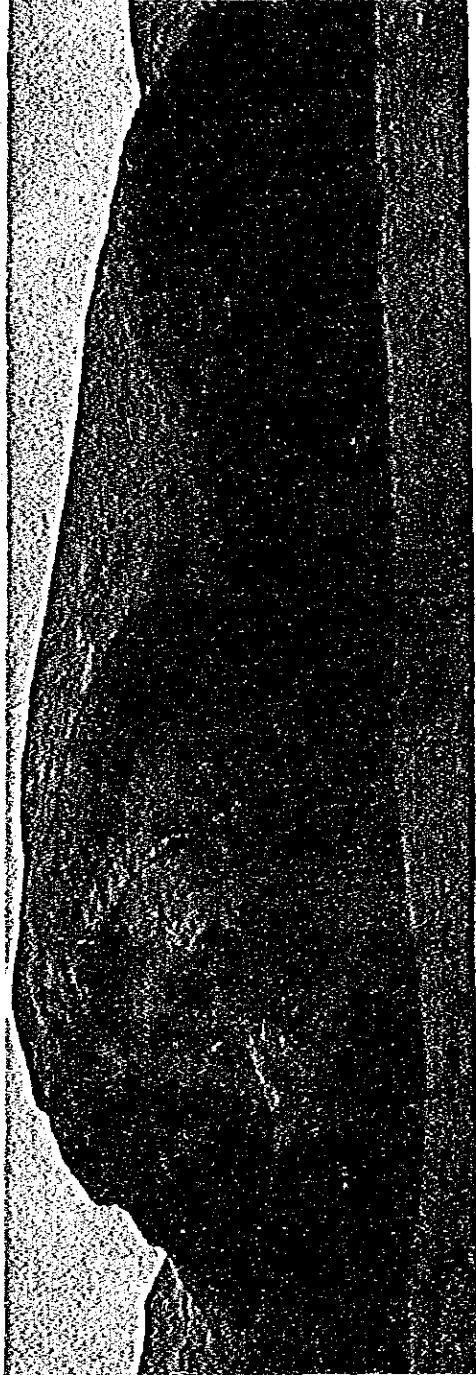


Photo. 1 Folded structure of the Ferrobamba limestone  
(Condorcocha)

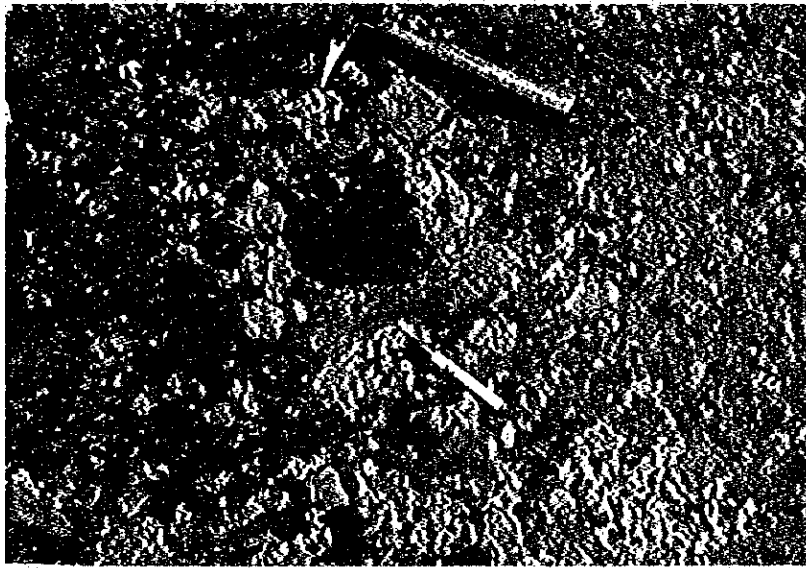


Photo. 2 Basal conglomerate of the Upper Puno  
Formation (Islaicocha)

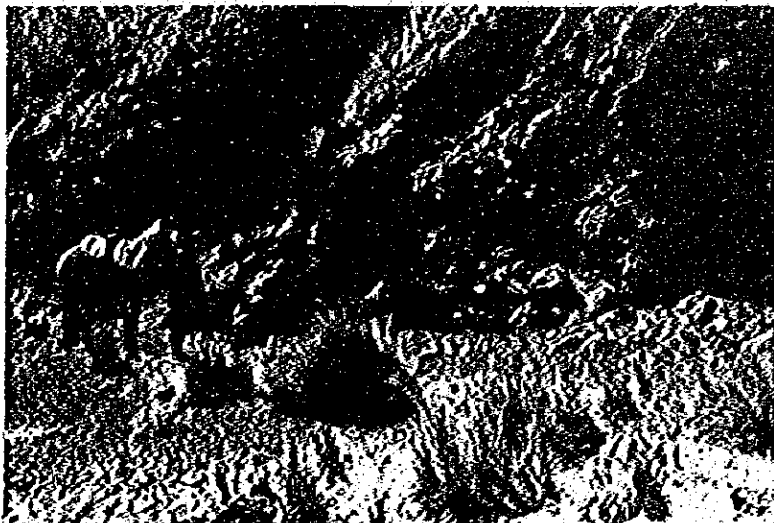


Photo. 3 Basal conglomerate of the Lower Tacaza  
Formation (Santa Lucia de Pichigua)

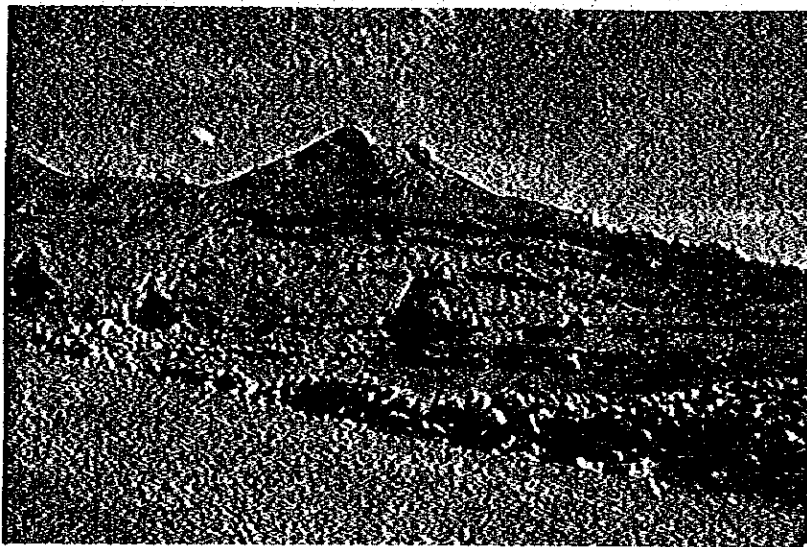


Photo. 4      Sencce volcanic neck (hill) intruded  
into the Lower Tacaza Formation  
(La Esquina)

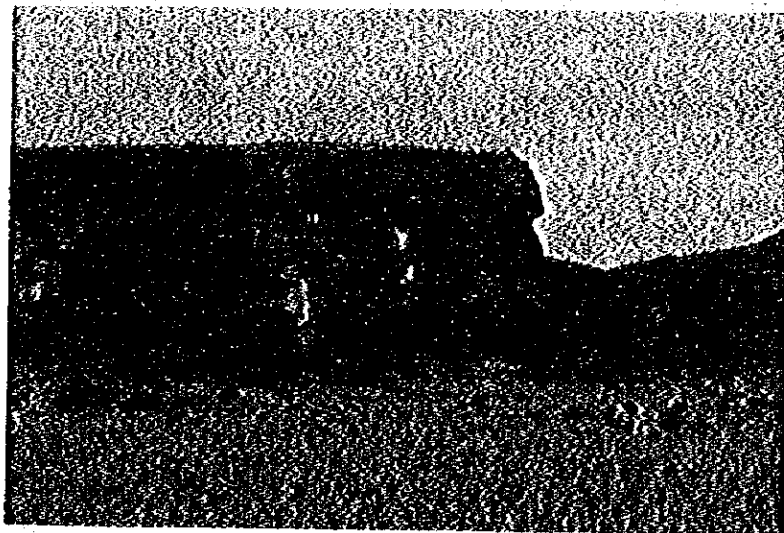


Photo. 5      Reddish tuff breccia of the Upper  
Descanso Formation      (Yauri)

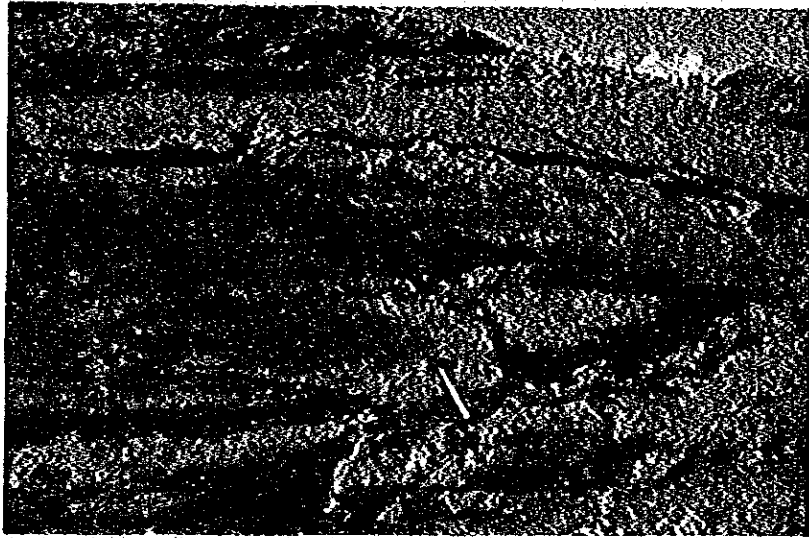


Photo. 6      Glacial striae      (Lag. Parihuana)

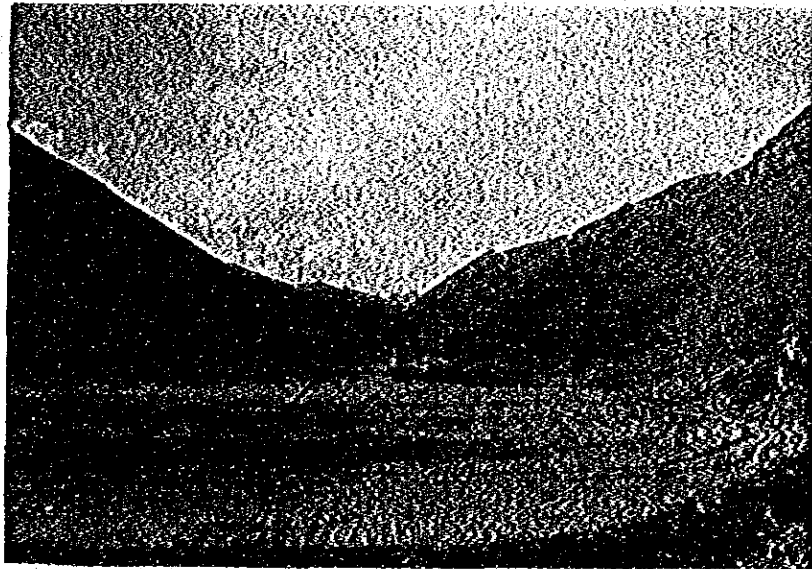


Photo. 7      Fault in the Rio Velille

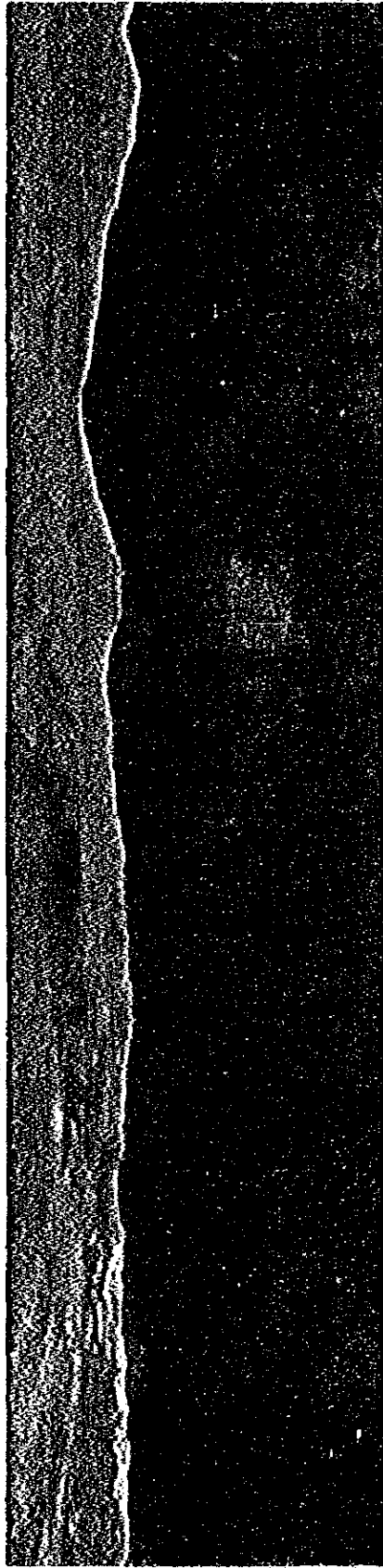


Photo. 8 View of Corocohnayco mineralized area

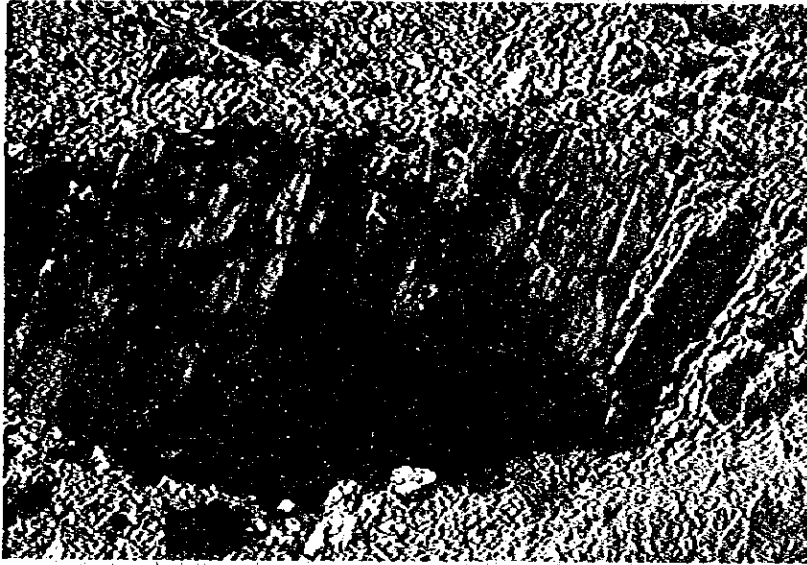


Photo. 9 Oxide copper at the old tunnel  
(Coroccohuayco)

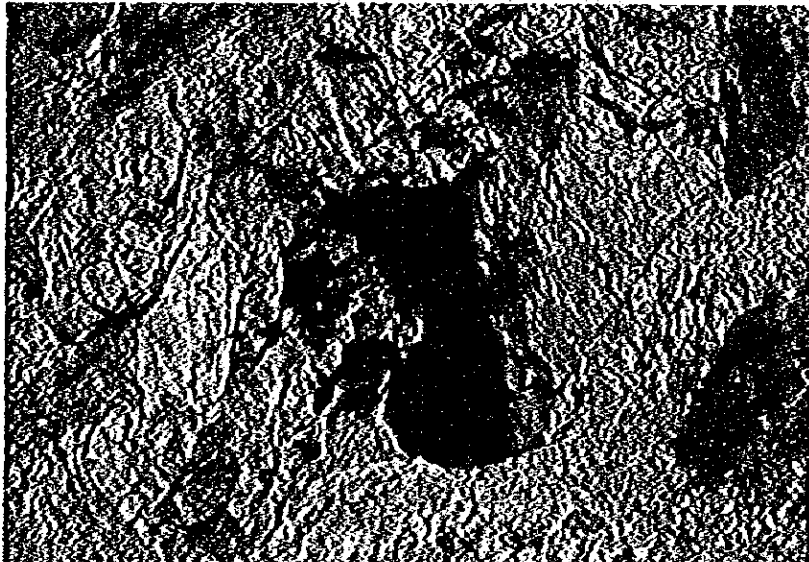


Photo. 10 Old tunnel explored for copper minerals  
in the Tacaza Group. (Huachana)





Photo. 11 Oil seepage of Islaicóoha

**APPENDICES**  
**(GEOPHYSICS)**

### Table III. Gravity Calculation

BNGWA ANNALES FOR SEA DENSITIES				THE GRAVIMETRIC SURVEY OF TANGI AREA IN PEHU 1922 13 - 11										M.S.C.O 171	
STATION-NO.	LATITUDE		LONGITUDE		ALTITUDE		G.V.-S.V.		2.03	2.23	2.43	2.63	2.83	2.93	3.03
NO.	DEG MIN SEC.	SEC MIN SEC.	DEG MIN SEC.	SEC MIN SEC.	METER	FT/L	NCAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL
1	201	-14 48 11	0	-71 22 37	0	1071.03	-2133.25	-247.27	-221.03	-331.08	-368.23	-375.63	-376.83	-376.83	
2	202	-14 48 11	0	-71 22 40	0	1074.43	-2137.59	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
3	203	-14 47 59	0	-71 21 31	0	1071.71	-2135.59	-247.27	-221.03	-331.08	-368.23	-375.63	-376.83	-376.83	
4	204	-14 47 47	0	-71 21 17	0	1074.21	-2137.59	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
5	205	-14 47 35	0	-71 20 03	0	1076.16	-2140.27	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
6	206	-14 47 23	0	-71 18 49	0	1078.09	-2142.95	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
7	207	-14 47 11	0	-71 17 35	0	1080.02	-2145.63	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
8	208	-14 46 59	0	-71 16 21	0	1081.95	-2148.31	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
9	209	-14 46 47	0	-71 15 07	0	1083.88	-2150.99	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
10	210	-14 46 35	0	-71 13 53	0	1085.81	-2153.67	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
11	211	-14 46 23	0	-71 12 39	0	1087.74	-2156.35	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
12	212	-14 46 11	0	-71 11 25	0	1089.67	-2159.03	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
13	213	-14 45 59	0	-71 10 11	0	1091.60	-2161.71	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
14	214	-14 45 47	0	-71 08 57	0	1093.53	-2164.39	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
15	215	-14 45 35	0	-71 07 43	0	1095.46	-2167.07	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
16	216	-14 45 23	0	-71 06 29	0	1097.39	-2169.75	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
17	217	-14 45 11	0	-71 05 15	0	1099.32	-2172.43	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
18	218	-14 45 00	0	-71 04 01	0	1101.25	-2175.11	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
19	219	-14 44 48	0	-71 02 47	0	1103.18	-2177.79	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
20	220	-14 44 36	0	-71 01 33	0	1105.11	-2180.47	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
21	221	-14 44 24	0	-71 00 19	0	1107.04	-2183.15	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
22	222	-14 44 12	0	-70 59 05	0	1108.97	-2185.83	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
23	223	-14 44 00	0	-70 57 51	0	1110.90	-2188.51	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
24	224	-14 43 48	0	-70 56 37	0	1112.83	-2191.19	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
25	225	-14 43 36	0	-70 55 23	0	1114.76	-2193.87	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
26	226	-14 43 24	0	-70 54 09	0	1116.69	-2196.55	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
27	227	-14 43 12	0	-70 52 55	0	1118.62	-2199.23	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
28	228	-14 43 00	0	-70 51 41	0	1120.55	-2201.91	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
29	229	-14 42 48	0	-70 50 27	0	1122.48	-2204.59	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
30	230	-14 42 36	0	-70 49 13	0	1124.41	-2207.27	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
31	231	-14 42 24	0	-70 47 59	0	1126.34	-2209.95	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
32	232	-14 42 12	0	-70 46 45	0	1128.27	-2212.63	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
33	233	-14 42 00	0	-70 45 31	0	1130.20	-2215.31	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
34	234	-14 41 48	0	-70 44 17	0	1132.13	-2217.99	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
35	235	-14 41 36	0	-70 43 03	0	1134.06	-2220.67	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
36	236	-14 41 24	0	-70 41 49	0	1135.99	-2223.35	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
37	237	-14 41 12	0	-70 40 35	0	1137.92	-2226.03	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
38	238	-14 41 00	0	-70 39 21	0	1139.85	-2228.71	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
39	239	-14 40 48	0	-70 38 07	0	1141.78	-2231.39	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
40	240	-14 40 36	0	-70 36 53	0	1143.71	-2234.07	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
41	241	-14 40 24	0	-70 35 39	0	1145.64	-2236.75	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
42	242	-14 40 12	0	-70 34 25	0	1147.57	-2239.43	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
43	243	-14 40 00	0	-70 33 11	0	1149.50	-2242.11	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
44	244	-14 39 48	0	-70 31 57	0	1151.43	-2244.79	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
45	245	-14 39 36	0	-70 30 43	0	1153.36	-2247.47	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
46	246	-14 39 24	0	-70 29 29	0	1155.29	-2250.15	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
47	247	-14 39 12	0	-70 28 15	0	1157.22	-2252.83	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
48	248	-14 39 00	0	-70 27 01	0	1159.15	-2255.51	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
49	249	-14 38 48	0	-70 25 47	0	1161.08	-2258.19	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
50	250	-14 38 36	0	-70 24 33	0	1163.01	-2260.87	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
51	251	-14 38 24	0	-70 23 19	0	1164.94	-2263.55	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
52	252	-14 38 12	0	-70 22 05	0	1166.87	-2266.23	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
53	253	-14 38 00	0	-70 20 51	0	1168.80	-2268.91	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
54	254	-14 37 48	0	-70 19 37	0	1170.73	-2271.59	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
55	255	-14 37 36	0	-70 18 23	0	1172.66	-2274.27	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
56	256	-14 37 24	0	-70 17 09	0	1174.59	-2276.95	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
57	257	-14 37 12	0	-70 15 55	0	1176.52	-2279.63	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
58	258	-14 37 00	0	-70 14 41	0	1178.45	-2282.31	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
59	259	-14 36 48	0	-70 13 27	0	1180.38	-2284.99	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
60	260	-14 36 36	0	-70 12 13	0	1182.31	-2287.67	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
61	261	-14 36 24	0	-70 10 59	0	1184.24	-2290.35	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
62	262	-14 36 12	0	-70 09 45	0	1186.17	-2293.03	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
63	263	-14 36 00	0	-70 08 31	0	1188.10	-2295.71	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
64	264	-14 35 48	0	-70 07 17	0	1190.03	-2298.39	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
65	265	-14 35 36	0	-70 06 03	0	1191.96	-2301.07	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
66	266	-14 35 24	0	-70 04 49	0	1193.89	-2303.75	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
67	267	-14 35 12	0	-70 03 35	0	1195.82	-2306.43	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
68	268	-14 35 00	0	-70 02 21	0	1197.75	-2309.11	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
69	269	-14 34 48	0	-70 01 07	0	1200.00	-2311.79	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
70	270	-14 34 36	0	-70 00 00	0	1202.25	-2314.47	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
71	271	-14 34 24	0	-69 58 50	0	1204.50	-2317.15	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
72	272	-14 34 12	0	-69 57 40	0	1206.75	-2319.83	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
73	273	-14 34 00	0	-69 56 30	0	1209.00	-2322.51	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
74	274	-14 33 48	0	-69 55 20	0	1211.25	-2325.19	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
75	275	-14 33 36	0	-69 54 10	0	1213.50	-2327.87	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03	-377.03	
76	276	-14 33 24	0	-69 53 00	0	1215.75	-2330.55	-247.26	-221.04	-331.09	-368.24	-375.64	-377.03		

THE GEOMETRIC SURVEY OF VARIOUS AREAS IN PERS. 1872-73-74

Table with 12 columns: STATION-NO., LATITUDE, LONGITUDE, ALTITUDE, G.V.-S.V., 2.00, 2.25, 2.50, 2.75, 2.50, 2.75. Rows 101-199.

THE GEOMETRIC SURVEY OF VARIOUS AREAS IN PERS. 1872-73-74

Table with 12 columns: STATION-NO., LATITUDE, LONGITUDE, ALTITUDE, G.V.-S.V., 2.00, 2.25, 2.50, 2.75, 2.50, 2.75. Rows 200-299.

RANGE ANOMALIES FOR SIX DENSITIES

RESCO 115

THE CARABINIER SURVEY OF YAGUI AREA IN PERU 1972 10 - 11

STATION-NO.	LATITUDE	LONGITUDE	HEIGHT	P.W.-S.V.	P.63	P.70	P.85	P.93	P.97	P.99
201	16 39 51.0	-71 13 0.0	4921.65	-1332.23	-242.55	-311.69	-351.53	-383.93	-415.33	-446.73
202	16 38 54.0	-71 10 20.0	4075.10	-1107.90	-241.45	-341.61	-384.74	-413.17	-445.02	-476.87
203	16 38 17.0	-71 10 37.0	3557.69	-1132.26	-219.46	-311.91	-364.62	-402.62	-441.22	-479.82
204	16 37 39.0	-71 10 39.0	4151.50	-1217.97	-278.15	-347.71	-397.32	-431.91	-465.91	-499.91
205	16 36 52.0	-71 10 38.0	4252.68	-1132.37	-212.52	-311.53	-359.28	-397.71	-435.55	-473.32
206	16 36 15.0	-71 12 7.0	3177.35	-1061.71	-219.15	-317.56	-365.26	-401.34	-437.05	-472.76
207	16 35 39.0	-71 22 21.0	3115.52	-1293.25	-212.27	-311.18	-364.28	-401.16	-437.95	-474.74
208	16 35 11.0	-71 20 34.0	4116.66	-1200.44	-274.72	-329.13	-384.53	-419.94	-455.35	-490.76
209	16 34 35.0	-71 18 53.0	3925.47	-1192.12	-243.83	-312.13	-367.57	-402.62	-437.71	-472.80
210	16 33 57.0	-71 18 53.0	4324.30	-1107.29	-241.91	-311.53	-368.76	-404.96	-441.75	-478.54
211	16 33 21.0	-71 18 53.0	3935.78	-1172.93	-241.33	-310.63	-365.92	-401.71	-438.50	-475.29
212	16 32 44.0	-71 21 19.0	3959.10	-1162.43	-271.97	-335.19	-378.72	-414.34	-451.95	-489.56
213	16 32 08.0	-71 21 13.0	4242.56	-1191.33	-272.32	-339.17	-392.87	-431.87	-469.48	-507.09
214	16 31 31.0	-71 23 59.0	4067.20	-1195.51	-271.02	-359.86	-419.51	-459.95	-499.07	-538.19
215	16 30 54.0	-71 23 37.0	4132.68	-1132.31	-215.31	-339.62	-394.32	-439.19	-484.05	-528.92
216	16 30 17.0	-71 20 29.0	4041.70	-1106.70	-275.84	-359.86	-419.71	-457.92	-496.03	-534.14
217	16 29 40.0	-71 21 4.0	3926.52	-1107.18	-274.88	-359.85	-419.20	-457.14	-495.25	-533.36
218	16 29 03.0	-71 20 2.0	4047.70	-1105.45	-277.13	-317.36	-365.59	-402.82	-439.31	-475.80
219	16 28 26.0	-71 18 59.0	3195.50	-1201.63	-272.24	-312.31	-368.20	-404.33	-441.84	-479.35
220	16 27 49.0	-71 18 57.0	4117.65	-1132.51	-215.53	-311.53	-365.68	-401.24	-438.75	-476.26
221	16 27 12.0	-71 18 5.0	4312.61	-1120.11	-212.61	-311.53	-365.91	-401.21	-438.72	-476.23
222	16 26 35.0	-71 18 51.0	4027.70	-1105.74	-249.38	-314.06	-367.01	-411.54	-449.05	-486.56
223	16 25 58.0	-71 19 16.0	3906.60	-1102.31	-241.78	-315.29	-362.34	-402.33	-439.84	-477.35
224	16 25 21.0	-71 18 53.0	4264.10	-1102.16	-249.01	-316.08	-367.55	-402.61	-439.76	-477.27
225	16 24 44.0	-71 18 25.0	3959.02	-1112.28	-249.21	-319.65	-368.23	-403.31	-440.80	-478.31
226	16 24 07.0	-71 17 4.0	3979.50	-1172.85	-249.18	-319.71	-368.19	-403.24	-440.73	-478.24
227	16 23 30.0	-71 18 1.0	3926.10	-1172.72	-245.31	-315.02	-367.54	-401.82	-438.31	-475.80
228	16 22 53.0	-71 17 54.0	3958.90	-1172.87	-248.11	-319.24	-372.50	-406.51	-444.02	-481.53
229	16 22 16.0	-71 18 1.0	3958.28	-1172.28	-242.52	-319.92	-367.11	-405.82	-443.33	-480.84
230	16 21 39.0	-71 15 51.0	4358.72	-1172.93	-247.71	-339.67	-384.84	-422.65	-460.16	-497.67
231	16 21 02.0	-71 16 14.0	4112.52	-1202.52	-242.52	-312.52	-367.61	-403.11	-438.61	-474.11
232	16 20 25.0	-71 15 12.0	4185.10	-1172.11	-271.99	-366.01	-411.01	-446.02	-481.03	-516.04
233	16 19 48.0	-71 16 27.0	4141.52	-1122.12	-214.71	-308.18	-363.63	-402.13	-437.64	-473.15
234	16 19 11.0	-71 16 31.0	4111.70	-1172.51	-277.51	-337.37	-387.20	-422.23	-457.76	-493.29
235	16 18 34.0	-71 16 2.0	4107.60	-1176.28	-272.36	-326.78	-381.12	-425.52	-460.83	-496.14
236	16 17 57.0	-71 17 31.0	4119.40	-1167.51	-245.24	-318.01	-367.61	-403.11	-438.61	-474.11
237	16 17 20.0	-71 17 32.0	4112.60	-1167.60	-242.60	-317.63	-365.11	-401.61	-437.11	-472.61
238	16 16 43.0	-71 17 33.0	4014.50	-1101.03	-241.64	-314.54	-364.24	-401.64	-437.14	-472.64
239	16 16 06.0	-71 17 4.0	4011.11	-1101.24	-242.13	-315.03	-364.71	-402.11	-437.61	-473.11
240	16 15 29.0	-71 17 31.0	4012.20	-1101.96	-249.76	-314.97	-365.43	-402.74	-438.25	-473.76
241	16 14 52.0	-71 17 31.0	3952.30	-1101.26	-242.72	-314.71	-362.81	-401.65	-437.16	-472.67
242	16 14 15.0	-71 18 14.0	3978.50	-1172.19	-248.10	-314.83	-364.17	-403.48	-439.99	-476.50
243	16 13 38.0	-71 16 27.0	4011.51	-1105.81	-242.81	-314.81	-364.81	-403.51	-439.02	-475.14
244	16 13 01.0	-71 17 27.0	3956.72	-1172.81	-246.91	-319.16	-367.47	-403.83	-439.34	-475.45
245	16 12 24.0	-71 18 17.0	4027.80	-1103.59	-252.25	-325.58	-381.57	-418.59	-454.60	-490.61
246	16 11 47.0	-71 19 31.0	4066.70	-1171.53	-245.35	-347.02	-401.10	-435.38	-470.72	-506.13
247	16 11 10.0	-71 19 53.0	4111.52	-1167.16	-245.16	-317.63	-365.11	-401.61	-437.11	-472.61
248	16 10 33.0	-71 20 24.0	4209.80	-1174.83	-246.48	-318.04	-365.64	-402.14	-437.64	-473.14
249	16 10 06.0	-71 20 32.0	4218.93	-1175.11	-247.72	-318.03	-365.63	-402.13	-437.63	-473.13
250	16 09 29.0	-71 19 54.0	4117.60	-1174.74	-245.17	-317.51	-365.07	-401.57	-437.07	-472.57

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RANGE ANOMALIES FOR SIX DENSITIES

RESCO 116

THE CARABINIER SURVEY OF YAGUI AREA IN PERU 1972 10 - 11

STATION-NO.	LATITUDE	LONGITUDE	HEIGHT	P.W.-S.V.	P.63	P.70	P.85	P.93	P.97	P.99
251	16 08 51.0	-71 19 23.0	4371.10	-1175.23	-247.57	-318.55	-366.05	-401.55	-437.05	-472.55
252	16 08 14.0	-71 19 35.0	4385.70	-1175.70	-248.70	-319.68	-367.18	-402.68	-438.18	-473.68
253	16 07 37.0	-71 19 31.0	4127.60	-1174.93	-241.59	-318.11	-365.65	-401.65	-437.15	-472.65
254	16 07 00.0	-71 20 1.0	4118.50	-1174.45	-257.71	-320.48	-371.54	-406.61	-441.72	-476.83
255	16 06 23.0	-71 20 27.0	4120.26	-1174.57	-252.95	-320.37	-371.89	-406.92	-442.03	-477.14
256	16 05 46.0	-71 20 35.0	4098.80	-1166.71	-255.65	-324.50	-374.51	-409.52	-445.63	-480.74
257	16 05 09.0	-71 19 58.0	4124.65	-1185.99	-248.91	-318.91	-364.98	-400.05	-435.16	-470.27
258	16 04 32.0	-71 19 35.0	4124.65	-1185.99	-248.91	-318.91	-364.98	-400.05	-435.16	-470.27
259	16 03 55.0	-71 18 54.0	4106.82	-1199.95	-252.24	-322.63	-377.58	-414.71	-450.84	-486.97
260	16 03 18.0	-71 18 44.0	4291.75	-1211.47	-269.31	-320.14	-371.05	-407.12	-443.25	-479.38
261	16 02 41.0	-71 18 15.0	4315.09	-1161.43	-261.13	-318.78	-368.61	-405.87	-442.02	-478.15
262	16 02 04.0	-71 18 32.0	4177.10	-1199.95	-258.78	-324.53	-375.51	-412.64	-448.77	-484.90
263	16 01 27.0	-71 17 49.0	4267.45	-1176.59	-248.17	-318.59	-367.01	-403.11	-438.61	-474.11
264	16 00 50.0	-71 18 02.0	4144.35	-1144.25	-244.61	-314.83	-364.62	-401.72	-437.23	-472.74
265	16 00 13.0	-71 18 11.0	4149.82	-1172.77	-242.64	-314.51	-364.34	-401.44	-436.95	-472.46
266	16 00 02.0	-71 17 52.0	4146.76	-1174.07	-247.47	-319.77	-369.12	-406.57	-442.70	-478.83
267	16 00 02.0	-71 17 52.0	4202.71	-1184.76	-241.93	-309.73	-362.13	-403.71	-438.81	-473.91
268	16 00 02.0	-71 17 24.0	4267.45	-1176.59	-248.17	-318.59	-367.01	-403.11	-438.61	-474.11
269	16 00 02.0	-71 17 31.0	4131.00	-1144.76	-248.43	-318.92	-364.50	-401.61	-437.11	-472.61
270	16 00 02.0	-71 17 31.0	4204.70	-1179.01	-249.77	-320.76	-364.10	-401.61	-437.11	-472.61
271	16 00 02.0	-71 18 12.0	4294.15	-1158.55	-250.31	-324.71	-362.23	-403.53	-439.06	-474.59
272	16 00 02.0	-71 18 51.0	4071.10	-1161.95	-241.19	-314.04	-361.82	-401.55	-437.06	-472.56
273	16 00 02.0	-71 18 13.0	4118.30	-1162.33	-243.30	-314.87	-362.65	-402.17	-437.68	-473.19
274	16 00 02.0	-71 18 45.0	4192.20	-1171.19	-245.19	-316.11	-364.04	-403.48	-439.01	-474.52
275	16 00 02.0	-71 18 02.0	4264.82	-1144.25	-244.54	-318.53	-364.52	-401.61	-437.11	-472.61
276	16 00 02.0	-71 18 02.0	4291.75	-1144.64	-244.64	-318.54	-364.54	-401.64	-437.14	-472.64
277	16 00 02.0	-71 19 37.0	4118.50	-1162.31	-241.12	-314.83	-364.28	-401.61	-437.11	-472.61
278	16 00 02.0	-71 19 35.0	4099.17	-1166.12	-243.45	-316.43	-366.71	-403.07	-439.44	-475.81
279	16 00 02.0	-71 20 31.0	4124.65	-1172.92	-248.22	-321.12	-371.13	-408.14	-444.27	-480.40
280	16 00 02.0	-71 20 31.0	4124.65	-1172.92	-248.22	-321.12	-371.13	-408.14	-444.27	-480.40
281	16 00 02.0	-71 20 31.0	4124							

## BROUWER ANOMALIES FOR SIX DENSITIES

NEOSCO 171

## THE GEOMETRIC SURVEY OF TAPE AREA IN PEARL 1972 11 - 11

STATION-NO. NO.	LATITUDE		LONGITUDE	ALTITUDE	G.W.-S.V.					
	DEG MIN SEC	DEG MIN SEC			2.00	2.20	2.40	2.60	2.80	3.00
101	14 58 21.0	71 18 31.0	5553.67	-1245.12	-265.31	-286.25	-315.58	-355.27	-402.23	-453.23
102	14 58 43.0	71 18 51.0	5555.70	-1245.50	-265.34	-286.25	-315.58	-355.27	-402.23	-453.23
103	14 59 05.0	71 19 11.0	5557.73	-1245.88	-265.37	-286.25	-315.58	-355.27	-402.23	-453.23
104	14 59 27.0	71 19 31.0	5559.76	-1246.26	-265.40	-286.25	-315.58	-355.27	-402.23	-453.23
105	14 59 49.0	71 19 51.0	5561.79	-1246.64	-265.43	-286.25	-315.58	-355.27	-402.23	-453.23
106	14 59 11.0	71 20 11.0	5563.82	-1247.02	-265.46	-286.25	-315.58	-355.27	-402.23	-453.23
107	14 59 33.0	71 20 31.0	5565.85	-1247.40	-265.49	-286.25	-315.58	-355.27	-402.23	-453.23
108	14 59 55.0	71 20 51.0	5567.88	-1247.78	-265.52	-286.25	-315.58	-355.27	-402.23	-453.23
109	14 59 17.0	71 21 11.0	5569.91	-1248.16	-265.55	-286.25	-315.58	-355.27	-402.23	-453.23
110	14 59 39.0	71 21 31.0	5571.94	-1248.54	-265.58	-286.25	-315.58	-355.27	-402.23	-453.23
111	14 59 61.0	71 21 51.0	5573.97	-1248.92	-265.61	-286.25	-315.58	-355.27	-402.23	-453.23
112	14 59 23.0	71 22 11.0	5576.00	-1249.30	-265.64	-286.25	-315.58	-355.27	-402.23	-453.23
113	14 59 45.0	71 22 31.0	5578.03	-1249.68	-265.67	-286.25	-315.58	-355.27	-402.23	-453.23
114	14 59 67.0	71 22 51.0	5580.06	-1250.06	-265.70	-286.25	-315.58	-355.27	-402.23	-453.23
115	14 59 29.0	71 23 11.0	5582.09	-1250.44	-265.73	-286.25	-315.58	-355.27	-402.23	-453.23
116	14 59 51.0	71 23 31.0	5584.12	-1250.82	-265.76	-286.25	-315.58	-355.27	-402.23	-453.23
117	14 59 73.0	71 23 51.0	5586.15	-1251.20	-265.79	-286.25	-315.58	-355.27	-402.23	-453.23
118	14 59 35.0	71 24 11.0	5588.18	-1251.58	-265.82	-286.25	-315.58	-355.27	-402.23	-453.23
119	14 59 57.0	71 24 31.0	5590.21	-1251.96	-265.85	-286.25	-315.58	-355.27	-402.23	-453.23
120	14 59 79.0	71 24 51.0	5592.24	-1252.34	-265.88	-286.25	-315.58	-355.27	-402.23	-453.23
121	14 59 41.0	71 25 11.0	5594.27	-1252.72	-265.91	-286.25	-315.58	-355.27	-402.23	-453.23
122	14 59 63.0	71 25 31.0	5596.30	-1253.10	-265.94	-286.25	-315.58	-355.27	-402.23	-453.23
123	14 59 85.0	71 25 51.0	5598.33	-1253.48	-265.97	-286.25	-315.58	-355.27	-402.23	-453.23
124	14 59 47.0	71 26 11.0	5600.36	-1253.86	-265.80	-286.25	-315.58	-355.27	-402.23	-453.23
125	14 59 69.0	71 26 31.0	5602.39	-1254.24	-265.83	-286.25	-315.58	-355.27	-402.23	-453.23
126	14 59 91.0	71 26 51.0	5604.42	-1254.62	-265.86	-286.25	-315.58	-355.27	-402.23	-453.23
127	14 59 53.0	71 27 11.0	5606.45	-1255.00	-265.89	-286.25	-315.58	-355.27	-402.23	-453.23
128	14 59 75.0	71 27 31.0	5608.48	-1255.38	-265.92	-286.25	-315.58	-355.27	-402.23	-453.23
129	14 59 97.0	71 27 51.0	5610.51	-1255.76	-265.95	-286.25	-315.58	-355.27	-402.23	-453.23
130	14 59 59.0	71 28 11.0	5612.54	-1256.14	-265.98	-286.25	-315.58	-355.27	-402.23	-453.23
131	14 59 81.0	71 28 31.0	5614.57	-1256.52	-266.01	-286.25	-315.58	-355.27	-402.23	-453.23
132	14 59 103.0	71 28 51.0	5616.60	-1256.90	-266.04	-286.25	-315.58	-355.27	-402.23	-453.23
133	14 59 65.0	71 29 11.0	5618.63	-1257.28	-266.07	-286.25	-315.58	-355.27	-402.23	-453.23
134	14 59 47.0	71 29 31.0	5620.66	-1257.66	-266.10	-286.25	-315.58	-355.27	-402.23	-453.23
135	14 59 69.0	71 29 51.0	5622.69	-1258.04	-266.13	-286.25	-315.58	-355.27	-402.23	-453.23
136	14 59 91.0	71 30 11.0	5624.72	-1258.42	-266.16	-286.25	-315.58	-355.27	-402.23	-453.23
137	14 59 53.0	71 30 31.0	5626.75	-1258.80	-266.19	-286.25	-315.58	-355.27	-402.23	-453.23
138	14 59 75.0	71 30 51.0	5628.78	-1259.18	-266.22	-286.25	-315.58	-355.27	-402.23	-453.23
139	14 59 97.0	71 31 11.0	5630.81	-1259.56	-266.25	-286.25	-315.58	-355.27	-402.23	-453.23
140	14 59 59.0	71 31 31.0	5632.84	-1259.94	-266.28	-286.25	-315.58	-355.27	-402.23	-453.23
141	14 59 41.0	71 31 51.0	5634.87	-1260.32	-266.31	-286.25	-315.58	-355.27	-402.23	-453.23
142	14 59 63.0	71 32 11.0	5636.90	-1260.70	-266.34	-286.25	-315.58	-355.27	-402.23	-453.23
143	14 59 85.0	71 32 31.0	5638.93	-1261.08	-266.37	-286.25	-315.58	-355.27	-402.23	-453.23
144	14 59 107.0	71 32 51.0	5640.96	-1261.46	-266.40	-286.25	-315.58	-355.27	-402.23	-453.23
145	14 59 69.0	71 33 11.0	5642.99	-1261.84	-266.43	-286.25	-315.58	-355.27	-402.23	-453.23
146	14 59 51.0	71 33 31.0	5645.02	-1262.22	-266.46	-286.25	-315.58	-355.27	-402.23	-453.23
147	14 59 33.0	71 33 51.0	5647.05	-1262.60	-266.49	-286.25	-315.58	-355.27	-402.23	-453.23
148	14 59 15.0	71 34 11.0	5649.08	-1262.98	-266.52	-286.25	-315.58	-355.27	-402.23	-453.23
149	14 59 37.0	71 34 31.0	5651.11	-1263.36	-266.55	-286.25	-315.58	-355.27	-402.23	-453.23
150	14 59 59.0	71 34 51.0	5653.14	-1263.74	-266.58	-286.25	-315.58	-355.27	-402.23	-453.23

PERM

## BROUWER ANOMALIES FOR SIX DENSITIES

NEOSCO 172

## THE GEOMETRIC SURVEY OF TAPE AREA IN PEARL 1972 12 - 11

STATION-NO. NO.	LATITUDE		LONGITUDE	ALTITUDE	G.W.-S.V.					
	DEG MIN SEC	DEG MIN SEC			2.00	2.20	2.40	2.60	2.80	3.00
151	14 59 21.0	71 35 11.0	5655.17	-1264.12	-266.61	-286.25	-315.58	-355.27	-402.23	-453.23
152	14 59 43.0	71 35 31.0	5657.20	-1264.50	-266.64	-286.25	-315.58	-355.27	-402.23	-453.23
153	14 59 65.0	71 35 51.0	5659.23	-1264.88	-266.67	-286.25	-315.58	-355.27	-402.23	-453.23
154	14 59 27.0	71 36 11.0	5661.26	-1265.26	-266.70	-286.25	-315.58	-355.27	-402.23	-453.23
155	14 59 49.0	71 36 31.0	5663.29	-1265.64	-266.73	-286.25	-315.58	-355.27	-402.23	-453.23
156	14 59 71.0	71 36 51.0	5665.32	-1266.02	-266.76	-286.25	-315.58	-355.27	-402.23	-453.23
157	14 59 33.0	71 37 11.0	5667.35	-1266.40	-266.79	-286.25	-315.58	-355.27	-402.23	-453.23
158	14 59 55.0	71 37 31.0	5669.38	-1266.78	-266.82	-286.25	-315.58	-355.27	-402.23	-453.23
159	14 59 77.0	71 37 51.0	5671.41	-1267.16	-266.85	-286.25	-315.58	-355.27	-402.23	-453.23
160	14 59 39.0	71 38 11.0	5673.44	-1267.54	-266.88	-286.25	-315.58	-355.27	-402.23	-453.23
161	14 59 61.0	71 38 31.0	5675.47	-1267.92	-266.91	-286.25	-315.58	-355.27	-402.23	-453.23
162	14 59 83.0	71 38 51.0	5677.50	-1268.30	-266.94	-286.25	-315.58	-355.27	-402.23	-453.23
163	14 59 45.0	71 39 11.0	5679.53	-1268.68	-266.97	-286.25	-315.58	-355.27	-402.23	-453.23
164	14 59 67.0	71 39 31.0	5681.56	-1269.06	-267.00	-286.25	-315.58	-355.27	-402.23	-453.23
165	14 59 89.0	71 39 51.0	5683.59	-1269.44	-267.03	-286.25	-315.58	-355.27	-402.23	-453.23
166	14 59 51.0	71 40 11.0	5685.62	-1269.82	-267.06	-286.25	-315.58	-355.27	-402.23	-453.23
167	14 59 73.0	71 40 31.0	5687.65	-1270.20	-267.09	-286.25	-315.58	-355.27	-402.23	-453.23
168	14 59 95.0	71 40 51.0	5689.68	-1270.58	-267.12	-286.25	-315.58	-355.27	-402.23	-453.23
169	14 59 57.0	71 41 11.0	5691.71	-1270.96	-267.15	-286.25	-315.58	-355.27	-402.23	-453.23
170	14 59 39.0	71 41 31.0	5693.74	-1271.34	-267.18	-286.25	-315.58	-355.27	-402.23	-453.23
171	14 59 61.0	71 41 51.0	5695.77	-1271.72	-267.21	-286.25	-315.58	-355.27	-402.23	-453.23
172	14 59 83.0	71 42 11.0	5697.80	-1272.10	-267.24	-286.25	-315.58	-355.27	-402.23	-453.23
173	14 59 45.0	71 42 31.0	5700.83	-1272.48	-267.27	-286.25	-315.58	-355.27	-402.23	-453.23
174	14 59 67.0	71 42 51.0	5702.86	-1272.86	-267.30	-286.25	-315.58	-355.27	-402.23	-453.23
175	14 59 89.0	71 43 11.0	5704.89	-1273.24	-267.33	-286.25	-315.58	-355.27	-402.23	-453.23
176	14 59 51.0	71 43 31.0	5706.92	-1273.62	-267.36	-286.25	-315.58	-355.27	-402.23	-453.23
177	14 59 73.0	71 43 51.0	5708.95	-1274.00	-267.39	-286.25	-315.58	-355.27	-402.23	-453.23
178	14 59 95.0	71 44 11.0	5710.98	-1274.38	-267.42	-286.25	-315.58	-355.27	-402.23	-453.23
179	14 59 57.0	71 44 31.0	5713.01	-1274.76	-267.45	-286.25	-315.58	-355.27	-402.23	-453.23
180	14 59 39.0	71 44 51.0	5715.04	-1275.14	-267.48	-286.25	-315.58	-355.27		

BENCHER ANOMALIES FOR SIX SERIES

MSCD 123

THE GEOMETRIC SURVEY OF TAURI AREA IN PERU 1972 10 - 11

Table with columns: STATION-NO., LATITUDE, LONGITUDE, ALTITUDE, G.P.-S.V., and columns 2.00 through 2.05. Rows include station numbers 601-650 and their corresponding coordinates and values.

END

BENCHER ANOMALIES FOR SIX SERIES

MSCD 124

THE GEOMETRIC SURVEY OF TAURI AREA IN PERU 1972 12 - 13

Table with columns: STATION-NO., LATITUDE, LONGITUDE, ALTITUDE, G.P.-S.V., and columns 2.00 through 2.05. Rows include station numbers 651-700 and their corresponding coordinates and values.

BUFFER ANALYSIS FOR SIX DENSITIES

ASPC 181

THE GEOMETRIC SURVEY OF TRAIL AREA IN 1972

DATE 12-11

STATION-NO.	LATITUDE	LONGITUDE	ALTITUDE	6.V.-S.V.	Z.00	Z.20	Z.40	Z.60	Z.80	Z.99
501	16 48 24.0	-71 10 12.0	4253.40	-1161.71	-269.32	-330.21	-337.13	-317.05	-312.33	-325.75
502	16 48 18.0	-71 10 24.0	4377.40	-1165.60	-269.45	-335.51	-339.57	-314.03	-313.59	-325.78
503	16 42 36.0	-71 11 30.0	4375.50	-1163.17	-269.82	-342.71	-353.05	-319.33	-313.22	-322.63
504	16 42 51.0	-71 17 0.0	4381.50	-1165.96	-271.81	-337.64	-354.23	-319.65	-315.31	-323.05
505	16 43 18.0	-71 17 12.0	4328.10	-1162.43	-269.71	-338.92	-352.98	-321.85	-313.15	-322.92
506	16 43 43.0	-71 18 0.0	4336.50	-1161.45	-268.02	-341.06	-351.64	-315.61	-313.92	-323.32
507	16 44 22.0	-71 17 15.0	4333.10	-1164.61	-268.15	-345.47	-349.16	-317.63	-313.81	-321.81
508	16 44 51.0	-71 17 0.0	4339.00	-1167.61	-273.65	-343.31	-348.15	-314.11	-311.71	-320.63
509	16 45 42.0	-71 16 30.0	4346.10	-1177.63	-281.32	-349.71	-354.19	-318.02	-313.51	-320.67
510	16 45 11.0	-71 16 45.0	4352.10	-1174.15	-271.15	-347.18	-349.18	-316.93	-313.51	-321.72
511	16 45 44.0	-71 16 15.0	4355.10	-1175.15	-274.03	-349.23	-351.51	-317.72	-313.52	-321.92
512	16 43 30.0	-71 16 21.0	4327.10	-1174.42	-274.07	-347.53	-352.25	-316.76	-312.70	-320.45
513	16 43 12.0	-71 16 33.0	4319.10	-1182.13	-271.57	-349.15	-354.81	-317.51	-312.32	-321.17
514	16 42 31.0	-71 16 24.0	4341.00	-1209.11	-274.63	-348.63	-354.79	-316.71	-312.61	-322.71
515	16 42 21.0	-71 16 47.0	4325.10	-1193.43	-287.58	-344.63	-354.61	-315.51	-312.87	-321.87
516	16 43 18.0	-71 16 45.0	4328.10	-1188.15	-274.18	-349.16	-354.78	-316.93	-312.81	-321.72
517	16 44 50.0	-71 15 30.0	4315.00	-1189.11	-275.21	-348.16	-354.61	-316.12	-312.71	-321.71
518	16 44 50.0	-71 16 15.0	4327.10	-1193.15	-272.65	-349.16	-354.61	-316.12	-312.71	-321.71
519	16 42 35.0	-71 15 32.0	4337.00	-1181.33	-266.53	-342.01	-348.41	-314.63	-312.63	-320.63
520	16 41 50.0	-71 14 50.0	4338.00	-1181.33	-266.53	-342.01	-348.41	-314.63	-312.63	-320.63
521	16 42 10.0	-71 15 32.0	4338.00	-1181.33	-266.53	-342.01	-348.41	-314.63	-312.63	-320.63
522	16 42 30.0	-71 15 10.0	4335.10	-1178.55	-270.45	-349.16	-354.79	-316.71	-312.61	-321.71
523	16 43 24.0	-71 14 52.0	4344.10	-1193.43	-287.58	-344.63	-354.61	-315.51	-312.87	-321.87
524	16 43 30.0	-71 14 55.0	4346.10	-1195.00	-287.07	-348.41	-354.79	-316.12	-312.61	-321.71
525	16 43 21.0	-71 15 11.0	4341.00	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
526	16 42 47.0	-71 14 47.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
527	16 43 27.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
528	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
529	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
530	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
531	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
532	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
533	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
534	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
535	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
536	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
537	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
538	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
539	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
540	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
541	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
542	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
543	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
544	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
545	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
546	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
547	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
548	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
549	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52
550	16 43 21.0	-71 15 32.0	4345.10	-1187.65	-274.92	-347.91	-353.62	-315.62	-312.52	-321.52

48000

BUFFER ANALYSIS FOR SIX DENSITIES

ASPC 182

THE GEOMETRIC SURVEY OF TRAIL AREA IN 1972

DATE 12-11

STATION-NO.	LATITUDE	LONGITUDE	ALTITUDE	6.V.-S.V.	Z.00	Z.20	Z.40	Z.60	Z.80	Z.99
551	16 32 21.0	-71 23 15.0	4316.10	-1185.96	-273.82	-348.41	-354.79	-316.12	-312.61	-321.71
552	16 33 11.0	-71 23 21.0	4344.10	-1186.37	-274.71	-347.91	-354.79	-316.12	-312.61	-321.71
553	16 33 22.0	-71 19 47.0	4320.00	-1184.11	-274.15	-349.16	-354.79	-316.12	-312.61	-321.71
554	16 33 22.0	-71 19 54.0	4314.00	-1185.10	-274.15	-349.16	-354.79	-316.12	-312.61	-321.71
555	16 32 51.0	-71 19 31.0	4352.10	-1185.83	-274.52	-349.16	-354.79	-316.12	-312.61	-321.71
556	16 32 51.0	-71 19 27.0	4377.10	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
557	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
558	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
559	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
560	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
561	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
562	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
563	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
564	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
565	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
566	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
567	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
568	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
569	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
570	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
571	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
572	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
573	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
574	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
575	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
576	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
577	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
578	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
579	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71
580	16 33 11.0	-71 18 21.0	4373.40	-1184.54	-273.17	-347.91	-354.79	-316.12	-312.61	-321.71





ANGULAR ANALYSES FOR SIX DENSITY

M.50. 103

THE GAUDETIC SURVEY OF KAJI AREA IN 1972 12 - 11

STATION NO.	LATITUDE	LONGITUDE	ALTITUDE	G.V.-S.V.	2.07	2.20	2.43	2.63	2.87	3.09
NO.	DEC MIN SEC.	DEC MIN SEC.	METER	%AL	%AL	%AL	%AL	%AL	%AL	%AL
701	011	-15 22 14 0	-71 18 2 0	1338.60	-1165.91	-1278.12	-1327.08	-1376.93	-1426.78	-1476.63
702	018	-15 31 34 0	-71 19 11 0	1342.10	-1159.96	-1272.97	-1321.93	-1371.78	-1421.63	-1471.48
703	025	-15 30 3 0	-71 19 19 0	1336.63	-1153.82	-1265.83	-1314.79	-1364.64	-1414.49	-1464.34
704	032	-15 30 3 0	-71 19 28 0	1333.63	-1167.53	-1280.54	-1329.50	-1379.35	-1429.20	-1479.05
705	039	-15 54 4 0	-71 11 1 0	6717.70	-1177.04	-1289.05	-1338.01	-1387.96	-1437.81	-1487.66
706	046	-15 55 24 0	-71 19 19 0	1344.20	-1163.12	-1276.13	-1325.09	-1374.94	-1424.79	-1474.64
707	053	-15 54 54 0	-71 19 11 0	1352.60	-1172.13	-1284.14	-1333.10	-1382.95	-1432.80	-1482.65
708	060	-14 58 18 0	-71 9 42 0	5297.70	-1177.34	-1289.35	-1338.31	-1388.16	-1438.01	-1487.86
709	067	-15 55 27 0	-71 9 13 0	5299.10	-1175.60	-1287.61	-1336.57	-1386.42	-1436.27	-1486.12
710	074	-15 55 37 0	-71 11 4 0	5284.70	-1188.71	-1299.72	-1348.68	-1398.53	-1448.38	-1498.23
711	081	-15 55 37 0	-71 11 15 0	5284.70	-1190.71	-1301.72	-1350.68	-1400.53	-1450.38	-1500.23
712	088	-15 55 59 0	-71 11 15 0	5284.40	-1190.91	-1301.92	-1350.88	-1400.73	-1450.58	-1500.43
713	095	-15 57 5 0	-71 24 1 0	1525.33	-1183.83	-1296.84	-1345.80	-1395.65	-1445.50	-1495.35
714	102	-15 57 5 0	-71 14 8 0	1504.10	-1190.71	-1301.72	-1350.68	-1400.53	-1450.38	-1500.23
715	109	-15 58 11 0	-71 13 13 0	1525.40	-1192.71	-1303.72	-1353.68	-1403.53	-1453.38	-1503.23
716	116	-14 48 1 0	-71 13 13 0	1514.30	-1194.71	-1305.72	-1355.68	-1405.53	-1455.38	-1505.23
717	123	-15 41 50 0	-71 12 43 0	1565.30	-1196.71	-1307.72	-1357.68	-1407.53	-1457.38	-1507.23
718	130	-14 47 21 0	-71 22 29 0	1573.20	-1198.71	-1309.72	-1359.68	-1409.53	-1459.38	-1509.23
719	137	-15 43 7 0	-71 13 52 0	1576.60	-1199.71	-1311.72	-1361.68	-1411.53	-1461.38	-1511.23
720	144	-14 48 15 0	-71 13 52 0	1582.40	-1201.71	-1313.72	-1363.68	-1413.53	-1463.38	-1513.23
721	151	-14 48 15 0	-71 13 22 0	6202.20	-1197.93	-1311.94	-1361.90	-1411.75	-1461.60	-1511.45
722	158	-14 45 37 0	-71 13 20 0	6214.60	-1199.93	-1313.94	-1363.90	-1413.75	-1463.60	-1513.45
723	165	-15 45 3 0	-71 13 29 0	6215.60	-1199.93	-1313.94	-1363.90	-1413.75	-1463.60	-1513.45
724	172	-14 47 18 0	-71 13 33 0	6215.50	-1197.93	-1311.94	-1361.90	-1411.75	-1461.60	-1511.45
725	179	-14 51 59 0	-71 13 33 0	6215.50	-1197.93	-1311.94	-1361.90	-1411.75	-1461.60	-1511.45
726	186	-15 48 3 0	-71 12 9 0	6208.70	-1195.95	-1309.96	-1359.92	-1409.77	-1459.62	-1509.47
727	193	-14 51 59 0	-71 12 5 0	1392.60	-1197.96	-1311.97	-1363.93	-1413.76	-1463.61	-1513.46
728	200	-15 57 33 0	-71 9 35 0	4769.20	-1198.97	-1312.98	-1364.94	-1414.77	-1464.62	-1514.47
729	207	-14 52 51 0	-71 9 55 0	6231.68	-1198.93	-1312.94	-1362.90	-1412.71	-1462.56	-1512.41
730	214	-14 49 3 0	-71 9 59 0	6232.68	-1198.93	-1312.94	-1362.90	-1412.71	-1462.56	-1512.41
731	221	-14 52 53 0	-71 7 54 0	6254.68	-1191.98	-1305.99	-1355.95	-1405.80	-1455.65	-1505.50
732	228	-14 51 50 0	-71 7 5 0	6290.70	-1201.95	-1315.96	-1365.92	-1415.77	-1465.62	-1515.47
733	235	-14 51 12 0	-71 6 55 0	6296.70	-1203.95	-1317.96	-1367.92	-1417.77	-1467.62	-1517.47
734	242	-14 57 31 0	-71 6 19 0	4786.70	-1207.94	-1321.95	-1371.91	-1421.76	-1471.61	-1521.46
735	249	-14 57 25 0	-71 5 47 0	4817.60	-1209.94	-1323.95	-1373.91	-1423.76	-1473.61	-1523.46
736	256	-14 58 15 0	-71 5 24 0	4818.60	-1211.94	-1325.95	-1375.91	-1425.76	-1475.61	-1525.46
737	263	-14 52 52 0	-71 5 55 0	6256.70	-1197.93	-1313.94	-1363.90	-1413.75	-1463.60	-1513.45
738	270	-14 56 24 0	-71 5 7 0	6195.50	-1227.00	-1327.01	-1376.97	-1426.82	-1476.67	-1526.52
739	277	-14 56 2 0	-71 5 25 0	6150.40	-1231.01	-1331.02	-1380.98	-1430.83	-1480.68	-1530.53
740	284	-14 55 2 0	-71 4 19 0	1331.30	-1197.93	-1311.94	-1361.90	-1411.75	-1461.60	-1511.45
741	291	-14 56 1 0	-71 4 15 0	6214.60	-1199.93	-1313.94	-1363.90	-1413.75	-1463.60	-1513.45
742	298	-14 56 4 0	-71 7 5 0	6214.60	-1199.93	-1313.94	-1363.90	-1413.75	-1463.60	-1513.45
743	305	-14 56 10 0	-71 8 31 0	6214.60	-1199.93	-1313.94	-1363.90	-1413.75	-1463.60	-1513.45
744	312	-14 56 21 0	-71 8 8 0	6235.30	-1199.91	-1313.92	-1363.88	-1413.73	-1463.58	-1513.43
745	319	-14 56 56 0	-71 8 1 0	6252.68	-1199.85	-1313.86	-1363.82	-1413.67	-1463.52	-1513.37
746	326	-14 56 34 0	-71 7 17 0	6254.68	-1199.85	-1313.86	-1363.82	-1413.67	-1463.52	-1513.37
747	333	-14 56 39 0	-71 6 43 0	6293.70	-1197.90	-1311.91	-1361.87	-1411.72	-1461.57	-1511.42
748	340	-14 57 21 0	-71 6 31 0	6294.60	-1197.90	-1311.91	-1361.87	-1411.72	-1461.57	-1511.42
749	347	-14 57 23 0	-71 6 2 0	6187.60	-1191.94	-1305.95	-1355.91	-1405.76	-1455.61	-1505.46
750	354	-14 57 28 0	-71 6 23 0	6194.10	-1199.91	-1313.92	-1363.88	-1413.73	-1463.58	-1513.43

ANGULAR ANALYSES FOR SIX DENSITIES

M.50. 104

THE GAUDETIC SURVEY OF KAJI AREA IN 1972 13 - 11

STATION NO.	LATITUDE	LONGITUDE	ALTITUDE	G.V.-S.V.	2.53	2.76	2.99	3.21	3.43	
NO.	DEC MIN SEC.	DEC MIN SEC.	METER	%AL	%AL	%AL	%AL	%AL	%AL	
751	3115	-14 57 21 0	-71 15 47 0	6297.70	-1197.93	-1313.94	-1363.90	-1413.75	-1463.60	-1513.45
752	3118	-14 57 21 0	-71 15 37 0	6295.70	-1197.93	-1313.94	-1363.90	-1413.75	-1463.60	-1513.45
753	3121	-14 42 52 0	-71 15 34 0	6314.60	-1193.95	-1309.96	-1359.92	-1409.77	-1459.62	-1509.47
754	3124	-14 41 24 0	-71 15 8 0	6314.20	-1198.97	-1314.98	-1364.94	-1414.77	-1464.62	-1514.47
755	3127	-14 41 24 0	-71 14 37 0	6284.60	-1196.97	-1312.98	-1362.94	-1412.77	-1462.62	-1512.47
756	3130	-14 47 58 0	-71 14 33 0	6293.50	-1195.95	-1311.96	-1361.92	-1411.76	-1461.61	-1511.46
757	3133	-14 49 4 0	-71 14 12 0	6294.50	-1195.95	-1311.96	-1361.92	-1411.76	-1461.61	-1511.46
758	3136	-14 41 24 0	-71 15 6 0	6174.70	-1193.94	-1309.95	-1359.91	-1409.76	-1459.61	-1509.46
759	3139	-14 40 53 0	-71 15 0 0	6252.30	-1193.91	-1309.92	-1359.88	-1409.73	-1459.58	-1509.43
760	3142	-14 42 0 0	-71 14 9 0	6265.70	-1193.44	-1309.45	-1359.41	-1409.26	-1459.11	-1509.16
761	3145	-14 47 33 0	-71 14 5 0	6265.60	-1193.44	-1309.45	-1359.41	-1409.26	-1459.11	-1509.16
762	3148	-14 43 6 0	-71 14 53 0	6267.70	-1193.41	-1309.42	-1359.38	-1409.23	-1459.08	-1509.13
763	3151	-14 43 6 0	-71 14 40 0	6265.60	-1193.44	-1309.45	-1359.41	-1409.26	-1459.11	-1509.16
764	3154	-14 43 36 0	-71 14 20 0	6297.60	-1193.47	-1309.48	-1359.44	-1409.29	-1459.14	-1509.19
765	3157	-14 43 36 0	-71 14 56 0	6299.70	-1193.50	-1309.51	-1359.47	-1409.32	-1459.17	-1509.22
766	3160	-14 44 23 0	-71 14 8 0	6311.20	-1193.60	-1309.61	-1359.57	-1409.42	-1459.27	-1509.27
767	3163	-14 44 23 0	-71 13 14 0	6292.10	-1192.62	-1308.63	-1358.59	-1408.44	-1458.29	-1508.24
768	3166	-14 43 0 0	-71 14 53 0	6294.60	-1193.41	-1309.42	-1359.38	-1409.23	-1459.08	-1509.13
769	3169	-14 43 33 0	-71 14 45 0	6304.50	-1193.52	-1309.53	-1359.49	-1409.34	-1459.19	-1509.24
770	3172	-14 43 3 0	-71 14 24 52 0	6322.41	-1191.45	-1307.46	-1357.42	-1407.26	-1457.11	-1507.06
771	3175	-14 48 33 0	-71 24 52 0	6329.41	-1191.82	-1307.89	-1357.85	-1407.70	-1457.55	-1507.50
772	3178	-14 49 12 0	-71 24 45 0	6329.41	-1191.82	-1307.89	-1357.85	-1407.70	-1457.55	-1507.50
773	3181	-14 50 52 0	-71 24 45 0	6329.41	-1191.82	-1307.89	-1357.85	-1407.70	-1457.55	-1507.50
774	3184	-14 51 11 0	-71 24 50 0	6317.48	-1193.39	-1309.40	-1359.36	-1409.31	-1459.16	-1509.11
775	3187	-14 51 47 0	-71 24 53 0	6324.48	-1193.42	-1309.43	-1359.39	-1409.34	-1459.19	-1509.14
776	3190	-14 52 10 0	-71 24 45 0	6324.48	-1193.42	-1309.43	-1359.39	-1409.34	-1459.19	-1509.14
777	3193	-14 52 52 0	-71 24 51 0	6337.90	-1193.85	-1309.86	-1359.82	-1409.77	-1459.62	-1509.57
778	3196	-14 53 18 0	-71 24 53 0	6344.90	-1194.28	-1310.29	-1360.25	-1410.20	-1460.05	-1510.00
779	3200	-14 53 33 0	-71 24 45 0	6350.82	-1194.82	-1310.83	-1360.79	-1410.74	-1460.59	-1510.54
780	3203	-14 53 18 0	-71 24 44 0	6341.95	-1194.43	-1310.44	-1360.40	-1410.31	-1460.16	-1510.11
781	3206	-14 53 18 0	-71 24 18 0	6351.97	-1194.97	-1310.98	-1360.94	-1410.85	-1460.70	-1510.65
782	3209	-14 53 18 0	-71 24 31 0	6364.64	-1194.82	-1310.83	-1360.79	-1410.74	-1460.59	-1510.54
783	3212	-14 53 18 0	-71 24 52 0	6369.62	-1194.85	-1310.86	-1360.82	-1410.77	-1460.62	-1510.57
784	3215	-14 53 18 0	-71 24 50 0	6371.62	-1194.85	-1310.86	-1360.82	-1410.77	-1460.62	-1510.57
785	3218	-14 52 54 0	-71 23 16 0	6376.61	-1195.33	-1311.34	-1361.30	-1411.25	-1461.10	-1511.05
786	3221	-14 54 14 0	-71 22 54 0	6386.55	-1195.87	-1311.88	-1361.84	-1411.79	-1461.64	-1511.59
787	3224	-14 54 36 0	-71 22 32 0	6392.50	-1196.41	-1312.42	-1362.38	-1412.33	-1462.18	-1512.13
788	3227	-14 56 56 0	-71 22 18 0							

BRIDGE APPALACHIAN FOR SIX CENTILES  
 THE GEOMETRIC SURVEY OF VAPO AREA IN PERIOD 1972 10 - 11  
MCSO 181

STATION NO.	LATITUDE	LONGITUDE	ALTITUDE	G.V.-S.V.			2.60	2.61	2.62	2.63	2.64	2.65
				NGAL	NGAL	NGAL						
NO.	DEC MIN SEC.	DEC MIN SEC.	FEET	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL
901	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
902	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
903	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
904	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
905	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
906	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
907	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
908	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
909	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11
910	18 33 21.0	-71 18 53.0	4252.10	-1172.10	-261.11	-275.84	-313.81	-322.81	-328.01	-332.01	-335.11	-338.11

BRIDGE APPALACHIAN FOR SIX CENTILES  
 THE GEOMETRIC SURVEY OF VAPO AREA IN PERIOD 1972 10 - 11  
MCSO 188

STATION NO.	LATITUDE	LONGITUDE	ALTITUDE	G.V.-S.V.			2.60	2.61	2.62	2.63	2.64	2.65
				NGAL	NGAL	NGAL						
NO.	DEC MIN SEC.	DEC MIN SEC.	FEET	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL	NGAL
951	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
952	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
953	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
954	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
955	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
956	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
957	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
958	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
959	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17
960	18 36 32.0	-71 11 21.0	4081.30	-1171.52	-260.93	-262.57	-314.17	-323.17	-328.17	-332.17	-335.17	-338.17

THE GAUSSIAN SURVEY OF FAULT AREA IN 1922

STATION NO.	LATITUDE	LONGITUDE	ALTITUDE	G.V.S.V.	7.03	7.20	7.45	7.43	7.67	7.83	
OFF MIN SEC.	OFF MIN SEC.	FEET	MGAL	MGAL	MGAL	MGAL	MGAL	MGAL	MGAL	MGAL	
901	4124	-14 34 21 N	-71 23 21 W	4126.00	-1177.26	-233.73	-203.12	-225.21	-227.92	-248.77	-256.74
902	4125	-14 34 22 N	-71 23 22 W	4124.00	-1178.37	-234.34	-203.11	-224.18	-227.91	-248.75	-256.74
903	4126	-14 34 23 N	-71 23 23 W	4122.00	-1179.47	-234.95	-203.10	-224.25	-227.90	-248.74	-256.73
904	4127	-14 34 24 N	-71 23 24 W	4120.00	-1180.58	-235.56	-203.09	-224.32	-227.89	-248.73	-256.72
905	4128	-14 34 25 N	-71 23 25 W	4118.00	-1181.68	-236.17	-203.08	-224.39	-227.88	-248.72	-256.71
906	4129	-14 34 26 N	-71 23 26 W	4116.00	-1182.78	-236.78	-203.07	-224.46	-227.87	-248.71	-256.70
907	4130	-14 34 27 N	-71 23 27 W	4114.00	-1183.88	-237.39	-203.06	-224.53	-227.86	-248.70	-256.69
908	4131	-14 34 28 N	-71 23 28 W	4112.00	-1184.98	-238.00	-203.05	-224.60	-227.85	-248.69	-256.68
909	4132	-14 34 29 N	-71 23 29 W	4110.00	-1186.08	-238.61	-203.04	-224.67	-227.84	-248.68	-256.67
910	4133	-14 34 30 N	-71 23 30 W	4108.00	-1187.18	-239.22	-203.03	-224.74	-227.83	-248.67	-256.66
911	4134	-14 34 31 N	-71 23 31 W	4106.00	-1188.28	-239.83	-203.02	-224.81	-227.82	-248.66	-256.65
912	4135	-14 34 32 N	-71 23 32 W	4104.00	-1189.38	-240.44	-203.01	-224.88	-227.81	-248.65	-256.64
913	4136	-14 34 33 N	-71 23 33 W	4102.00	-1190.48	-241.05	-203.00	-224.95	-227.80	-248.64	-256.63
914	4137	-14 34 34 N	-71 23 34 W	4100.00	-1191.58	-241.66	-202.99	-225.02	-227.79	-248.63	-256.62
915	4138	-14 34 35 N	-71 23 35 W	4098.00	-1192.68	-242.27	-202.98	-225.09	-227.78	-248.62	-256.61
916	4139	-14 34 36 N	-71 23 36 W	4096.00	-1193.78	-242.88	-202.97	-225.16	-227.77	-248.61	-256.60
917	4140	-14 34 37 N	-71 23 37 W	4094.00	-1194.88	-243.49	-202.96	-225.23	-227.76	-248.60	-256.59
918	4141	-14 34 38 N	-71 23 38 W	4092.00	-1195.98	-244.10	-202.95	-225.30	-227.75	-248.59	-256.58
919	4142	-14 34 39 N	-71 23 39 W	4090.00	-1197.08	-244.71	-202.94	-225.37	-227.74	-248.58	-256.57
920	4143	-14 34 40 N	-71 23 40 W	4088.00	-1198.18	-245.32	-202.93	-225.44	-227.73	-248.57	-256.56
921	4144	-14 34 41 N	-71 23 41 W	4086.00	-1199.28	-245.93	-202.92	-225.51	-227.72	-248.56	-256.55
922	4145	-14 34 42 N	-71 23 42 W	4084.00	-1200.38	-246.54	-202.91	-225.58	-227.71	-248.55	-256.54
923	4146	-14 34 43 N	-71 23 43 W	4082.00	-1201.48	-247.15	-202.90	-225.65	-227.70	-248.54	-256.53
924	4147	-14 34 44 N	-71 23 44 W	4080.00	-1202.58	-247.76	-202.89	-225.72	-227.69	-248.53	-256.52
925	4148	-14 34 45 N	-71 23 45 W	4078.00	-1203.68	-248.37	-202.88	-225.79	-227.68	-248.52	-256.51
926	4149	-14 34 46 N	-71 23 46 W	4076.00	-1204.78	-248.98	-202.87	-225.86	-227.67	-248.51	-256.50
927	4150	-14 34 47 N	-71 23 47 W	4074.00	-1205.88	-249.59	-202.86	-225.93	-227.66	-248.50	-256.49
928	4151	-14 34 48 N	-71 23 48 W	4072.00	-1206.98	-250.20	-202.85	-226.00	-227.65	-248.49	-256.48
929	4152	-14 34 49 N	-71 23 49 W	4070.00	-1208.08	-250.81	-202.84	-226.07	-227.64	-248.48	-256.47
930	4153	-14 34 50 N	-71 23 50 W	4068.00	-1209.18	-251.42	-202.83	-226.14	-227.63	-248.47	-256.46
931	4154	-14 34 51 N	-71 23 51 W	4066.00	-1210.28	-252.03	-202.82	-226.21	-227.62	-248.46	-256.45
932	4155	-14 34 52 N	-71 23 52 W	4064.00	-1211.38	-252.64	-202.81	-226.28	-227.61	-248.45	-256.44
933	4156	-14 34 53 N	-71 23 53 W	4062.00	-1212.48	-253.25	-202.80	-226.35	-227.60	-248.44	-256.43
934	4157	-14 34 54 N	-71 23 54 W	4060.00	-1213.58	-253.86	-202.79	-226.42	-227.59	-248.43	-256.42
935	4158	-14 34 55 N	-71 23 55 W	4058.00	-1214.68	-254.47	-202.78	-226.49	-227.58	-248.42	-256.41
936	4159	-14 34 56 N	-71 23 56 W	4056.00	-1215.78	-255.08	-202.77	-226.56	-227.57	-248.41	-256.40
937	4160	-14 34 57 N	-71 23 57 W	4054.00	-1216.88	-255.69	-202.76	-226.63	-227.56	-248.40	-256.39
938	4161	-14 34 58 N	-71 23 58 W	4052.00	-1217.98	-256.30	-202.75	-226.70	-227.55	-248.39	-256.38
939	4162	-14 34 59 N	-71 23 59 W	4050.00	-1219.08	-256.91	-202.74	-226.77	-227.54	-248.38	-256.37
940	4163	-14 35 00 N	-71 24 00 W	4048.00	-1220.18	-257.52	-202.73	-226.84	-227.53	-248.37	-256.36
941	4164	-14 35 01 N	-71 24 01 W	4046.00	-1221.28	-258.13	-202.72	-226.91	-227.52	-248.36	-256.35
942	4165	-14 35 02 N	-71 24 02 W	4044.00	-1222.38	-258.74	-202.71	-226.98	-227.51	-248.35	-256.34
943	4166	-14 35 03 N	-71 24 03 W	4042.00	-1223.48	-259.35	-202.70	-227.05	-227.50	-248.34	-256.33
944	4167	-14 35 04 N	-71 24 04 W	4040.00	-1224.58	-259.96	-202.69	-227.12	-227.49	-248.33	-256.32
945	4168	-14 35 05 N	-71 24 05 W	4038.00	-1225.68	-260.57	-202.68	-227.19	-227.48	-248.32	-256.31
946	4169	-14 35 06 N	-71 24 06 W	4036.00	-1226.78	-261.18	-202.67	-227.26	-227.47	-248.31	-256.30
947	4170	-14 35 07 N	-71 24 07 W	4034.00	-1227.88	-261.79	-202.66	-227.33	-227.46	-248.30	-256.29
948	4171	-14 35 08 N	-71 24 08 W	4032.00	-1228.98	-262.40	-202.65	-227.40	-227.45	-248.29	-256.28
949	4172	-14 35 09 N	-71 24 09 W	4030.00	-1230.08	-263.01	-202.64	-227.47	-227.44	-248.28	-256.27
950	4173	-14 35 10 N	-71 24 10 W	4028.00	-1231.18	-263.62	-202.63	-227.54	-227.43	-248.27	-256.26

1000

THE GAUSSIAN SURVEY OF FAULT AREA IN 1922

STATION NO.	LATITUDE	LONGITUDE	ALTITUDE	G.V.S.V.	7.03	7.20	7.45	7.43	7.67	7.83	
OFF MIN SEC.	OFF MIN SEC.	FEET	MGAL	MGAL	MGAL	MGAL	MGAL	MGAL	MGAL	MGAL	
951	4174	-14 35 11 N	-71 24 11 W	4026.00	-1232.28	-264.23	-202.62	-227.61	-227.42	-248.26	-256.25
952	4175	-14 35 12 N	-71 24 12 W	4024.00	-1233.38	-264.84	-202.61	-227.68	-227.41	-248.25	-256.24
953	4176	-14 35 13 N	-71 24 13 W	4022.00	-1234.48	-265.45	-202.60	-227.75	-227.40	-248.24	-256.23
954	4177	-14 35 14 N	-71 24 14 W	4020.00	-1235.58	-266.06	-202.59	-227.82	-227.39	-248.23	-256.22
955	4178	-14 35 15 N	-71 24 15 W	4018.00	-1236.68	-266.67	-202.58	-227.89	-227.38	-248.22	-256.21
956	4179	-14 35 16 N	-71 24 16 W	4016.00	-1237.78	-267.28	-202.57	-227.96	-227.37	-248.21	-256.20
957	4180	-14 35 17 N	-71 24 17 W	4014.00	-1238.88	-267.89	-202.56	-228.03	-227.36	-248.20	-256.19
958	4181	-14 35 18 N	-71 24 18 W	4012.00	-1239.98	-268.50	-202.55	-228.10	-227.35	-248.19	-256.18
959	4182	-14 35 19 N	-71 24 19 W	4010.00	-1241.08	-269.11	-202.54	-228.17	-227.34	-248.18	-256.17
960	4183	-14 35 20 N	-71 24 20 W	4008.00	-1242.18	-269.72	-202.53	-228.24	-227.33	-248.17	-256.16
961	4184	-14 35 21 N	-71 24 21 W	4006.00	-1243.28	-270.33	-202.52	-228.31	-227.32	-248.16	-256.15
962	4185	-14 35 22 N	-71 24 22 W	4004.00	-1244.38	-270.94	-202.51	-228.38	-227.31	-248.15	-256.14
963	4186	-14 35 23 N	-71 24 23 W	4002.00	-1245.48	-271.55	-202.50	-228.45	-227.30	-248.14	-256.13
964	4187	-14 35 24 N	-71 24 24 W	4000.00	-1246.58	-272.16	-202.49	-228.52	-227.29	-248.13	-256.12
965	4188	-14 35 25 N	-71 24 25 W	3998.00	-1247.68	-272.77	-202.48	-228.59	-227.28	-248.12	-256.11
966	4189	-14 35 26 N	-71 24 26 W	3996.00	-1248.78	-273.38	-202.47	-228.66	-227.27	-248.11	-256.10
967	4190	-14 35 27 N	-71 24 27 W	3994.00	-1249.88	-273.99	-202.46	-228.73	-227.26	-248.10	-256.09
968	4191	-14 35 28 N	-71 24 28 W	3992.00	-1250.98	-274.60	-202.45	-228.80	-227.25	-248.09	-256.08
969	4192	-14 35 29 N	-71 24 29 W	3990.00	-1252.08	-275.21	-202.44	-228.87	-227.24	-248.08	-256.07
970	4193	-14 35 30 N	-71 24 30 W	3988.00	-1253.18	-275.82	-202.43	-228.94	-227.23	-248.07	-256.06
971	4194	-14 35 31 N	-71 24 31 W	3986.00	-1254.28	-276.43	-202.42	-229.01	-227.22	-248.06	-256.05
972	4195	-14 35 32 N	-71 24 32 W	3984.00	-1255.38	-277.04	-202.41	-229.08	-227.21	-248.05	-256.04
973	4196	-14 35 33 N	-71 24 33 W	3982.00	-1256.48	-277.65	-202.40	-229.15	-227.20	-248.04	-256.03
974	4197	-14 35 34 N	-71 24 34 W	3980.00	-1257.58	-278.26	-202.39	-229.22	-227.19	-248.03	-256.02
975	4198	-14 35 35 N	-71 24 35 W	3978.00	-1258.68	-278.87	-202.38	-229.29	-227.18	-248.02	-256.01
976	4199	-14 35 36 N	-71 24 36 W	3976.00	-1259.78	-279.48	-202.37	-229.36	-227.17	-248.01	-256.00
977	4200	-14 35 37 N	-71 24 37 W	3974.00	-1260.88	-280.09	-202.36	-229.43	-227.16	-248.00	-255.99
978	4201	-14 35 38 N	-71 24 38 W	3972.00	-1261.98	-280.70	-202.35	-229.50	-227.15	-247.99	-255.98
979	4202	-14 35 39 N	-71 24 39 W	3970.00	-1263.08	-281.31	-202.34	-229.57	-227.14	-247.98	-255.97
980	4203	-14 35 40 N	-71 24 40 W	3968.00	-1264.18	-281.92	-202.33	-229.64	-227.13	-247.97	-255.96
981	4204	-14 35 41 N	-71 24 41 W	3966.00	-1265.28	-282.53	-202.32	-229.71	-227.12	-247.96	-255.95
982	4205	-14 35 42 N	-71 24 42 W	3964.00	-1266.38	-283.14	-202.31	-229.78	-227.11	-247.95	-255.94

NUMBER AND DATES FOR SIX DENSITIES

NSC 501

THE GRANTHAIR SURVEY OF RAUM AREA IN 1947 12 - 11

STATION NO.	LATITUDE	LONGITUDE	ALTITUDE	G.V.-5.47	2.00	2.20	2.45	2.60	2.82	2.65
NO.	DEC MIN SEC.	EPC MIN SEC.	METER	2.11	2.41	2.61	2.81	3.01	3.21	3.41
1301	14 52 51	-14 52 51	4223.00	-1106.10	-253.43	-228.13	-321.38	-358.21	-390.22	-420.41
1302	14 52 52	-14 52 52	4231.00	-1107.44	-258.47	-228.24	-324.46	-360.33	-392.34	-422.53
1303	14 52 53	-14 52 53	4239.00	-1108.78	-263.51	-228.35	-325.57	-362.44	-394.45	-424.64
1304	14 52 54	-14 52 54	4247.00	-1110.12	-268.55	-228.46	-326.68	-364.55	-396.56	-426.75
1305	14 52 55	-14 52 55	4255.00	-1111.46	-273.59	-228.57	-327.79	-366.66	-398.67	-428.86
1306	14 52 56	-14 52 56	4263.00	-1112.80	-278.63	-228.68	-328.90	-368.77	-400.78	-430.97
1307	14 52 57	-14 52 57	4271.00	-1114.14	-283.67	-228.79	-330.01	-370.88	-402.89	-433.08
1308	14 52 58	-14 52 58	4279.00	-1115.48	-288.71	-228.90	-331.12	-373.00	-405.00	-435.19
1309	14 52 59	-14 52 59	4287.00	-1116.82	-293.75	-229.01	-332.23	-375.11	-407.11	-437.30
1310	14 53 00	-14 53 00	4295.00	-1118.16	-298.79	-229.12	-333.34	-377.22	-409.22	-439.41
1311	14 53 01	-14 53 01	4303.00	-1119.50	-303.83	-229.23	-334.45	-379.33	-411.33	-441.52
1312	14 53 02	-14 53 02	4311.00	-1120.84	-308.87	-229.34	-335.56	-381.44	-413.44	-443.63
1313	14 53 03	-14 53 03	4319.00	-1122.18	-313.91	-229.45	-336.67	-383.55	-415.55	-445.74
1314	14 53 04	-14 53 04	4327.00	-1123.52	-318.95	-229.56	-337.78	-385.66	-417.66	-447.85
1315	14 53 05	-14 53 05	4335.00	-1124.86	-323.99	-229.67	-338.89	-387.77	-419.77	-449.96
1316	14 53 06	-14 53 06	4343.00	-1126.20	-329.03	-229.78	-340.00	-389.88	-421.88	-452.07
1317	14 53 07	-14 53 07	4351.00	-1127.54	-334.07	-229.89	-341.11	-392.00	-424.00	-454.18
1318	14 53 08	-14 53 08	4359.00	-1128.88	-339.11	-229.90	-342.22	-394.11	-426.11	-456.29
1319	14 53 09	-14 53 09	4367.00	-1130.22	-344.15	-230.01	-343.33	-396.22	-428.22	-458.40
1320	14 53 10	-14 53 10	4375.00	-1131.56	-349.19	-230.12	-344.44	-398.33	-430.33	-460.51
1321	14 53 11	-14 53 11	4383.00	-1132.90	-354.23	-230.23	-345.55	-400.44	-432.44	-462.62
1322	14 53 12	-14 53 12	4391.00	-1134.24	-359.27	-230.34	-346.66	-402.55	-434.55	-464.73
1323	14 53 13	-14 53 13	4403.00	-1135.58	-364.31	-230.45	-347.77	-404.66	-436.66	-466.84
1324	14 53 14	-14 53 14	4411.00	-1136.92	-369.35	-230.56	-348.88	-406.77	-438.77	-468.95
1325	14 53 15	-14 53 15	4419.00	-1138.26	-374.39	-230.67	-349.99	-408.88	-440.88	-471.06
1326	14 53 16	-14 53 16	4427.00	-1139.60	-379.43	-230.78	-351.10	-411.00	-443.00	-473.17
1327	14 53 17	-14 53 17	4435.00	-1140.94	-384.47	-230.89	-352.21	-413.11	-445.11	-475.28
1328	14 53 18	-14 53 18	4443.00	-1142.28	-389.51	-231.00	-353.32	-415.22	-447.22	-477.39
1329	14 53 19	-14 53 19	4451.00	-1143.62	-394.55	-231.11	-354.43	-417.33	-449.33	-479.50
1330	14 53 20	-14 53 20	4459.00	-1144.96	-399.59	-231.22	-355.54	-419.44	-451.44	-481.61
1331	14 53 21	-14 53 21	4467.00	-1146.30	-404.63	-231.33	-356.65	-421.55	-453.55	-483.72
1332	14 53 22	-14 53 22	4475.00	-1147.64	-409.67	-231.44	-357.76	-423.66	-455.66	-485.83
1333	14 53 23	-14 53 23	4483.00	-1148.98	-414.71	-231.55	-358.87	-425.77	-457.77	-487.94
1334	14 53 24	-14 53 24	4491.00	-1150.32	-419.75	-231.66	-360.00	-427.88	-459.88	-490.05
1335	14 53 25	-14 53 25	4499.00	-1151.66	-424.79	-231.77	-361.11	-430.00	-462.00	-492.16
1336	14 53 26	-14 53 26	4507.00	-1153.00	-429.83	-231.88	-362.22	-432.11	-464.11	-494.27
1337	14 53 27	-14 53 27	4515.00	-1154.34	-434.87	-231.99	-363.33	-434.22	-466.22	-496.38
1338	14 53 28	-14 53 28	4523.00	-1155.68	-439.91	-232.10	-364.44	-436.33	-468.33	-498.49
1339	14 53 29	-14 53 29	4531.00	-1157.02	-444.95	-232.21	-365.55	-438.44	-470.44	-500.60
1340	14 53 30	-14 53 30	4539.00	-1158.36	-449.99	-232.32	-366.66	-440.55	-472.55	-502.71
1341	14 53 31	-14 53 31	4547.00	-1159.70	-455.03	-232.43	-367.77	-442.66	-474.66	-504.82
1342	14 53 32	-14 53 32	4555.00	-1161.04	-460.07	-232.54	-368.88	-444.77	-476.77	-506.93
1343	14 53 33	-14 53 33	4563.00	-1162.38	-465.11	-232.65	-370.00	-446.88	-478.88	-509.04
1344	14 53 34	-14 53 34	4571.00	-1163.72	-470.15	-232.76	-371.11	-449.00	-481.00	-511.15
1345	14 53 35	-14 53 35	4579.00	-1165.06	-475.19	-232.87	-372.22	-451.11	-483.11	-513.26
1346	14 53 36	-14 53 36	4587.00	-1166.40	-480.23	-232.98	-373.33	-453.22	-485.22	-515.37
1347	14 53 37	-14 53 37	4595.00	-1167.74	-485.27	-233.09	-374.44	-455.33	-487.33	-517.48
1348	14 53 38	-14 53 38	4603.00	-1169.08	-490.31	-233.20	-375.55	-457.44	-489.44	-519.59
1349	14 53 39	-14 53 39	4611.00	-1170.42	-495.35	-233.31	-376.66	-459.55	-491.55	-521.70
1350	14 53 40	-14 53 40	4619.00	-1171.76	-500.39	-233.42	-377.77	-461.66	-493.66	-523.81
1351	14 53 41	-14 53 41	4627.00	-1173.10	-505.43	-233.53	-378.88	-463.77	-495.77	-525.92
1352	14 53 42	-14 53 42	4635.00	-1174.44	-510.47	-233.64	-380.00	-465.88	-497.88	-528.03
1353	14 53 43	-14 53 43	4643.00	-1175.78	-515.51	-233.75	-381.11	-468.00	-500.00	-530.14
1354	14 53 44	-14 53 44	4651.00	-1177.12	-520.55	-233.86	-382.22	-470.11	-502.11	-532.25
1355	14 53 45	-14 53 45	4659.00	-1178.46	-525.59	-233.97	-383.33	-472.22	-504.22	-534.36
1356	14 53 46	-14 53 46	4667.00	-1179.80	-530.63	-234.08	-384.44	-474.33	-506.33	-536.47
1357	14 53 47	-14 53 47	4675.00	-1181.14	-535.67	-234.19	-385.55	-476.44	-508.44	-538.58
1358	14 53 48	-14 53 48	4683.00	-1182.48	-540.71	-234.30	-386.66	-478.55	-510.55	-540.69
1359	14 53 49	-14 53 49	4691.00	-1183.82	-545.75	-234.41	-387.77	-480.66	-512.66	-542.80
1360	14 53 50	-14 53 50	4699.00	-1185.16	-550.79	-234.52	-388.88	-482.77	-514.77	-544.91
1361	14 53 51	-14 53 51	4707.00	-1186.50	-555.83	-234.63	-390.00	-484.88	-516.88	-547.02
1362	14 53 52	-14 53 52	4715.00	-1187.84	-560.87	-234.74	-391.11	-487.00	-519.00	-549.13
1363	14 53 53	-14 53 53	4723.00	-1189.18	-565.91	-234.85	-392.22	-489.11	-521.11	-551.24
1364	14 53 54	-14 53 54	4731.00	-1190.52	-570.95	-234.96	-393.33	-491.22	-523.22	-553.35
1365	14 53 55	-14 53 55	4739.00	-1191.86	-575.99	-235.07	-394.44	-493.33	-525.33	-555.46
1366	14 53 56	-14 53 56	4747.00	-1193.20	-581.03	-235.18	-395.55	-495.44	-527.44	-557.57
1367	14 53 57	-14 53 57	4755.00	-1194.54	-586.07	-235.29	-396.66	-497.55	-529.55	-559.68
1368	14 53 58	-14 53 58	4763.00	-1195.88	-591.11	-235.40	-397.77	-499.66	-531.66	-561.79
1369	14 53 59	-14 53 59	4771.00	-1197.22	-596.15	-235.51	-398.88	-501.77	-533.77	-563.90
1370	14 54 00	-14 54 00	4779.00	-1198.56	-601.19	-235.62	-400.00	-503.88	-535.88	-566.01
1371	14 54 01	-14 54 01	4787.00	-1200.00	-606.23	-235.73	-401.11	-506.00	-538.00	-568.12
1372	14 54 02	-14 54 02	4795.00	-1201.44	-611.27	-235.84	-402.22	-508.11	-540.11	-570.23
1373	14 54 03	-14 54 03	4803.00	-1202.88	-616.31	-235.95	-403.33	-510.22	-542.22	-572.34
1374	14 54 04	-14 54 04	4811.00	-1204.32	-621.35	-236.06	-404.44	-512.33	-544.33	-574.45
1375	14 54 05	-14 54 05	4819.00	-1205.76	-626.39	-236.17	-405.55	-514.44	-546.44	-576.56
1376	14 54 06	-14 54 06	4827.00	-1207.20	-631.43	-236.28	-406.66	-516.55	-548.55	-578.67
1377	14 54 07	-14 54 07	4835.00	-1208.64	-636.47	-236.39	-407.77	-518.66	-550.66	-580.78
1378	14 54 08	-14 54 08	4843.00	-1210.08	-641.51	-236.50	-408.88	-520.77	-552.77	-582.89
1379	14 54 09	-14 54 09	4851.00	-1211.52	-646.55	-236.61	-410.00	-522.88	-554.88	-585.00
1380	14 54 10	-14 54 10	4859.00	-1212.96	-651.59	-236.72	-411.11	-525.00	-557.00	-587.11
1381	14 54 11	-14 54 11	4867.00	-1214.40	-656.63	-236.83	-412.22	-527.11	-559.11	-589.22
1382	14 54 12	-14 54 12	4875.00	-1215.84	-661.67	-236.94	-413.33	-529.22	-561.22	-591.33
1383	14 54 13	-14 54 13	4883.00	-1217.28	-666.71	-237.05	-414.44	-531.33	-563.33	-593.44
1384	14 54 14	-14 54 14	4891.00	-1218.72	-671.75	-237.16	-415.55	-533.44	-565.44	-595.55
1385	14 54 15	-14 54 15	4899.00	-1220.16	-676.79	-237.27	-416.66	-535.55	-567.55	-597.66
1386	14 54 16	-14 54 16	4907.00	-1221.60	-681.83	-237.38	-417.77	-537.66	-569.66	-599.77
1387	14 54 17	-14 54 17	4915.00	-1223.04	-686.87	-237.49	-418.88	-539.77	-571.77	-601.88
1388	14 54 18	-14 54 18	4923.00	-1224.48	-691.91	-237.60	-420.00	-541.88	-573.88	-603.99
1389	14 54 19	-14 54 19	4931.00	-1225.92	-696.95	-237.71	-421.11	-544.00	-576.00	-606.10
1390	14 54 20	-14 54 20	4939.00	-1227.36	-701.99	-237.82	-422.22	-546.11	-578.11	-608.21
1391	14 54 21	-14 54 21	4947.00	-1228.80	-707.03	-237.93	-423.33	-548.22	-580.22	-610.32
1392	14 54 22	-14 54 22	4955.00	-1230.24	-712.07	-238.04	-424.44	-550.33	-582.33	-612.43

RANGES, ANGLES AND EGA SEA DENSITIES  
THE GEOMETRIC SURVEY OF FAJFI AREA IN PERU 1972 12 - 11

STATION-NO.	LONGITUDE	LATITUDE	HEIGHT	E.V.-S.V.	2.00	2.70	2.40	2.67	2.93
1001	14 51 10	-71 15 42	3247.20	-1152.42	-244.80	-247.92	-331.91	-348.00	-371.91
1002	14 51 10	-71 15 42	3247.20	-1152.42	-244.80	-247.92	-331.91	-348.00	-371.91
1003	14 51 24	-71 16 12	3248.30	-1153.55	-244.20	-247.32	-331.51	-347.60	-371.51
1004	14 51 42	-71 16 42	3249.40	-1154.68	-243.60	-246.72	-331.11	-347.20	-371.11
1005	14 52 00	-71 17 12	3250.50	-1155.81	-243.00	-246.12	-330.71	-346.80	-370.71
1006	14 52 18	-71 17 42	3251.60	-1156.94	-242.40	-245.52	-330.31	-346.40	-370.31
1007	14 52 36	-71 18 12	3252.70	-1158.07	-241.80	-244.92	-329.91	-346.00	-369.91
1008	14 52 54	-71 18 42	3253.80	-1159.20	-241.20	-244.32	-329.51	-345.60	-369.51
1009	14 53 12	-71 19 12	3254.90	-1160.33	-240.60	-243.72	-329.11	-345.20	-369.11
1010	14 53 30	-71 19 42	3256.00	-1161.46	-240.00	-243.12	-328.71	-344.80	-368.71
1011	14 53 48	-71 20 12	3257.10	-1162.59	-239.40	-242.52	-328.31	-344.40	-368.31
1012	14 54 06	-71 20 42	3258.20	-1163.72	-238.80	-241.92	-327.91	-344.00	-367.91
1013	14 54 24	-71 21 12	3259.30	-1164.85	-238.20	-241.32	-327.51	-343.60	-367.51
1014	14 54 42	-71 21 42	3260.40	-1165.98	-237.60	-240.72	-327.11	-343.20	-367.11
1015	14 55 00	-71 22 12	3261.50	-1167.11	-237.00	-240.12	-326.71	-342.80	-366.71
1016	14 55 18	-71 22 42	3262.60	-1168.24	-236.40	-239.52	-326.31	-342.40	-366.31
1017	14 55 36	-71 23 12	3263.70	-1169.37	-235.80	-238.92	-325.91	-342.00	-365.91
1018	14 55 54	-71 23 42	3264.80	-1170.50	-235.20	-238.32	-325.51	-341.60	-365.51
1019	14 56 12	-71 24 12	3265.90	-1171.63	-234.60	-237.72	-325.11	-341.20	-365.11
1020	14 56 30	-71 24 42	3267.00	-1172.76	-234.00	-237.12	-324.71	-340.80	-364.71
1021	14 56 48	-71 25 12	3268.10	-1173.89	-233.40	-236.52	-324.31	-340.40	-364.31
1022	14 57 06	-71 25 42	3269.20	-1175.02	-232.80	-235.92	-323.91	-340.00	-363.91
1023	14 57 24	-71 26 12	3270.30	-1176.15	-232.20	-235.32	-323.51	-339.60	-363.51
1024	14 57 42	-71 26 42	3271.40	-1177.28	-231.60	-234.72	-323.11	-339.20	-363.11
1025	14 58 00	-71 27 12	3272.50	-1178.41	-231.00	-234.12	-322.71	-338.80	-362.71
1026	14 58 18	-71 27 42	3273.60	-1179.54	-230.40	-233.52	-322.31	-338.40	-362.31
1027	14 58 36	-71 28 12	3274.70	-1180.67	-229.80	-232.92	-321.91	-338.00	-361.91
1028	14 58 54	-71 28 42	3275.80	-1181.80	-229.20	-232.32	-321.51	-337.60	-361.51
1029	14 59 12	-71 29 12	3276.90	-1182.93	-228.60	-231.72	-321.11	-337.20	-361.11
1030	14 59 30	-71 29 42	3278.00	-1184.06	-228.00	-231.12	-320.71	-336.80	-360.71
1031	14 59 48	-71 30 12	3279.10	-1185.19	-227.40	-230.52	-320.31	-336.40	-360.31
1032	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1033	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1034	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1035	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1036	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1037	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1038	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1039	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1040	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11

RANGES, ANGLES AND EGA SEA DENSITIES  
THE GEOMETRIC SURVEY OF FAJFI AREA IN PERU 1972 12 - 11

STATION-NO.	LONGITUDE	LATITUDE	HEIGHT	E.V.-S.V.	2.05	2.70	2.40	2.67	2.93
1041	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1042	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1043	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1044	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1045	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1046	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1047	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1048	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1049	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1050	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1051	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1052	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1053	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1054	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1055	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1056	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1057	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1058	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1059	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1060	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1061	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1062	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1063	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1064	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1065	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1066	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1067	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1068	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1069	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11
1070	14 59 54	-71 30 24	3279.50	-1185.50	-227.20	-230.32	-320.11	-336.20	-360.11



ENGINE PROFILES FOR SIX BENTONS

MS50-192

THE GALILEO SURVEY OF JARVIS ISLAND IN 1972 10-31

STATION NO.	LATITUDE	LONGITUDE	ALTITUDE	G.P. - 1.0	2.00	2.20	2.40	2.60	2.80	3.00
1301	14 53 51.0	-71 24 24.0	1954.10	-1119.13	-717.07	-210.82	-112.93	-258.91	-112.93	-210.82
1302	14 57 27.0	-71 14 43.0	1307.78	-1214.13	-211.63	-211.63	-211.63	-211.63	-211.63	-211.63
1303	14 56 52.0	-71 14 13.0	1201.92	-1212.12	-212.51	-212.51	-212.51	-212.51	-212.51	-212.51
1305	14 57 28.0	-71 17 18.0	1374.76	-1225.17	-215.00	-215.00	-215.00	-215.00	-215.00	-215.00
1305	14 57 28.0	-71 17 18.0	1374.76	-1225.17	-215.00	-215.00	-215.00	-215.00	-215.00	-215.00
1306	14 57 40.0	-71 11 1.0	1141.80	-1194.19	-216.07	-216.07	-216.07	-216.07	-216.07	-216.07
1307	14 52 58.0	-71 3 32.0	1211.18	-1211.18	-216.81	-216.81	-216.81	-216.81	-216.81	-216.81
1308	14 52 18.0	-71 2 47.25	1315.50	-1237.16	-216.11	-216.11	-216.11	-216.11	-216.11	-216.11
1309	14 52 2.0	-71 2 55.25	1322.28	-1232.35	-216.12	-216.12	-216.12	-216.12	-216.12	-216.12
1310	14 51 37.0	-71 0 14.75	1317.10	-1211.11	-216.16	-216.16	-216.16	-216.16	-216.16	-216.16
1311	14 50 54.0	-71 0 52.25	1315.18	-1215.08	-216.55	-216.55	-216.55	-216.55	-216.55	-216.55
1312	14 47 28.0	-71 24 34.0	1316.52	-1162.60	-216.99	-216.99	-216.99	-216.99	-216.99	-216.99



