TABLE 7

ANALYSES[a] OF ROCKS FROM UMNAK AND BOGOSLOF ISLANDS

(Columns 1–20: Northeastern Umnak; columns 21–33: Southwestern Umnak; columns 34–35: Bogoslof)

	1	2	3	4	5	6	7	8	9	10	11	12
	Northeastern Umnak											
MAJOR OXIDES												
SiO_2	45.7	48.43	48.7	48.97	50.1	50.52	50.60	51.4	52.23	52.43	52.58	53.1
Al_2O_3	12.9	18.94	14.9	16.27	23.0	19.71	18.06	14.4	17.04	15.27	14.97	18.4
Fe_2O_3	3.6	4.15	4.7	2.83	2.6	1.67	2.99	6.3	3.22	5.96	3.86	4.5
FeO	5.6	6.30	3.4	6.24	5.4	6.82	6.75	1.3	6.60	6.99	8.81	3.2
MgO	18.2	6.55	4.2	9.62	3.6	4.64	5.58	1.5	5.54	4.13	4.00	3.4
CaO	9.6	11.04	7.8	12.86	11.6	11.96	11.46	8.4	10.39	8.70	8.64	9.3
Na_2O	1.7	2.51	2.1	2.00	2.4	2.71	2.73	4.4	2.97	3.50	3.47	2.8
K_2O	0.52	0.52	0.92	0.54	0.44	0.58	0.53	1.1	0.78	1.24	1.22	1.4
Ignition[b] H_2O+	—	0.12	—	0.09	—	0.08	0.17	—	0.12	0.20	0.20	1.14
Ignition[b] H_2O-	-0.16[c]	0.11	10.1	0.04	-0.13[c]	0.01	0.05	6.3	0.06	0.11	0.07	0.54
Ignition[b] CO_2	—	—	—	—	—	—	—	—	—	—	—	0.65
TiO_2	0.51	1.20	1.2	0.72	0.74	0.97	1.10	0.93	1.24	1.48	1.80	1.0
P_2O_5	0.10	0.27	0.22	0.13	0.11	0.19	0.28	2.4	0.25	0.36	0.38	0.30
MnO	0.19	0.17	0.20	0.18	0.13	0.18	0.16	0.23	0.19	0.17	0.21	0.14
Total	98.62	100.31	98.44	100.49	100.12	100.04	100.46	98.66	100.63	100.54	100.21	99.85
Powder Sp. Gr.	3.02	2.97	2.49	3.0[d]	2.80	2.86	2.96	2.55	2.94	2.89	2.93	2.78
MINOR ELEMENTS[e]												
F	....	....	....	....	....	....	....	....	....	....	....	....
Cl	....	....	....	....	....	....	....	....	....	....	....	....
S	....	....	....	....	....	....	....	....	....	....	....	....
Zr	....	....	....	.004	.003	.005	....	....	....	.007	.008	.004
Ga	....	....	....	.0006	.0009	.0007	....	....	....	.0007	.001	.001
La	....	....	....	—	—	—	....	....	....	—	—	—
Sc	....	....	....	.004	—	—	....	....	....	—	—	—
Y	....	....	....	.003	.002	.002	....	....	....	.005	.006	.002
Yb	....	....	....	.0002	—	—	....	....	....	—	—	—
B	....	....	....	—	—	—	....	....	....	—	—	—
Be	....	....	....	—	—	—	....	....	....	—	—	—
Sr	....	....	....	.1	.05	.09	....	....	....	.1	.1	.05
Ba	....	....	....	.03	.01	.02	....	....	....	.03	.03	.05
Pb	....	....	....	.001	—	—	....	....	....	—	—	—
Mo	....	....	....	—	—	—	....	....	....	—	—	—
Cu	....	....	....	.02	.003	.02	....	....	....	.03	.04	.007
V	....	....	....	.03	.02	.02	....	....	....	.03	.05	.02
Cr	....	....	....	.03	.004	.008	....	....	....	.004	.01	.007
Ni	....	....	....	.01	.001	.004	....	....	....	.002	.004	.003
Co	....	....	....	.004	.002	.002	....	....	....	.002	.003	.002
Nb	....	....	....	—	—	—	....	....	....	—	—	—
Total	....	....	....	.2368	.0959	.1717	....	....	....	.2107	.252	.146
NORMS												
Q	—	—	12.1	—	2.5	—	1.2	4.6	2.8	4.9	3.7	10.1
C	—	—	—	—	—	—	—	—	—	—	—	—
or	2.8	3.1	5.6	2.8	2.8	3.5	3.0	6.7	4.5	7.3	7.2	8.3
ab	14.2	21.2	17.8	16.8	20.4	22.9	23.1	37.2	25.1	29.6	29.4	23.6
an	26.1	38.9	28.4	34.2	50.3	39.9	35.5	16.1	30.8	22.3	21.7	33.4
ne	—	—	—	—	—	—	—	—	—	—	—	—
di wo	8.6	5.9	3.6	12.1	2.7	7.6	8.1	4.2	7.9	7.7	7.8	3.0
di en	6.6	3.9	2.9	8.3	1.4	4.0	4.8	3.6	4.8	4.7	3.7	2.4
di fs	1.1	1.6	0.3	2.8	1.2	3.4	2.8	—	2.7	2.6	3.9	0.3
di (sum)	16.3	11.4	6.8	23.2	5.3	15.0	15.7	7.8	15.4	15.0	15.4	5.7
hy en	1.7	10.6	7.6	6.6	7.6	7.5	9.0	0.1	9.0	5.6	6.2	6.1
hy fs	0.3	4.2	0.5	2.2	5.9	6.4	5.6	—	5.1	3.2	6.6	0.4
hy (sum)	2.0	14.8	8.1	8.8	13.5	13.9	14.6	0.1	14.1	8.8	12.8	6.8
ol fo	26.1	1.3	—	6.3	—	0.1	—	—	—	—	—	—
ol fa	4.3	0.5	—	2.4	—	0.1	—	—	—	—	—	—
ol (sum)	30.4	1.8		8.7		0.2						
mt	5.3	6.0	6.7	4.2	3.7	2.4	4.3	2.3	4.7	8.7	5.6	6.5
il	0.9	2.3	2.3	1.4	1.4	1.8	2.1	1.7	2.4	2.8	3.4	2.0
hm	—	—	—	—	—	—	—	10.1	—	—	—	—
ap	0.3	0.6	0.6	0.3	0.3	0.4	0.7	5.7	0.6	0.8	0.9	0.7
cc	—	—	—	—	—	—	—	—	—	—	—	1.6
Total	98.3	100.1	88.4	100.4	100.2	100.0	100.2	92.3	100.4	100.2	100.1	98.4
NIGGLI VALUES												
si	83	110	150	103	124	122	120	175	129	134	136	148
al	14	25	27	20	33	28	25	29	25	23	23	30
fm	64	42	39	46	29½	34	39	24	40½	42	42	32
c	19	27	26	29	31	31	29	31	27	24	24	28
alk	3½	6	8	5	6½	7	7	17	7½	11	11	10
k	.16	.12	.23	.14	0.11	.12	.11	.14	.15	.19	.19	0.25
mg	.78	.53	.49	.66	0.45	.49	.51	.32	.50	.37	.36	0.45
qz	-31	-14	18	-17	-2	-6	-8	7	-1	-10	-8	8

	13	14	15	16	17	18	19	20	21	22	23	24
	Northeastern Umnak								Southwestern Umnak			
MAJOR OXIDES												
SiO_2	54.35	54.41	54.80	57.40	63.5	65.6	72.36	72.77	54.3	56.0	57.4	57.5
Al_2O_3	16.38	15.77	14.90	15.49	16.1	14.1	13.75	13.29	18.0	15.6	18.2	17.4
Fe_2O_3	3.01	4.27	2.88	1.97	1.4	2.0	0.59	1.48	1.7	2.1	2.0	2.2
FeO	8.00	6.55	9.00	7.86	5.0	3.8	2.33	1.55	7.8	4.8	5.0	5.2
MgO	3.34	4.02	3.00	2.94	1.2	0.49	0.09	0.08	3.8	8.8	4.0	3.8
CaO	8.08	8.29	7.15	6.74	3.8	2.8	1.53	1.27	7.9	7.7	7.7	6.9
Na_2O	3.66	3.50	3.83	3.96	4.6	4.3	4.64	4.72	3.4	2.4	2.9	3.6
K_2O	1.32	1.26	1.23	1.53	2.6	3.0	4.16	4.06	1.0	1.6	1.4	1.7
Ignition[b] H_2O+	0.08	0.09	0.18	0.20	—	—	0.27	0.10	—	—	—	—
Ignition[b] H_2O-	0.04	0.02	0.09	0.09	-0.08[c]	3.4	0.03	0.02	-0.20[c]	0.03	0.20	0.24
Ignition[b] CO_2	—	—	—	—	—	—	—	—	—	—	—	—
TiO_2	1.25	1.56	2.48	1.54	0.81	0.64	0.21	0.21	1.2	0.66	0.90	1.2
P_2O_5	0.33	0.25	0.65	0.32	0.23	0.16	0.06	0.06	0.3[illegible]	0.17	0.16	0.40
MnO	0.15	0.21	0.25	0.18	0.22	0.18	0.09	0.10	0.18	0.12	0.10	0.10
Total	99.99	100.20	100.44	100.22	99.46	100.47	100.11	99.71	99.60	99.98	99.96	100.24
Powder Sp. Gr.	2.88	2.8[d]	2.92	2.83	2.58	2.45	2.4[d]	2.4[d]	2.79	2.88	2.81	2.84
MINOR ELEMENTS[e]												
F	....	....	....	....	....	....	....	....	....	....	....	.09
Cl	....	....	....	....	....	....	....	....	....	....	....	.08
S	....	....	....	....	....	....	....	....	....	....	....	.03
Zr	....	....	.01	.01	....	....	.02	....	.007	....	.005	.007
Ga	....	....	.001	.0007	....	....	.001	....	.001	....	.0008	.002
La	....	....	—	—	....	....	.004	....	—	....	—	—
Sc	....	....	—	—	....	....	—	....	—	....	—	.002
Y	....	....	.007	.007	....	....	.01	....	.004	....	.002	.004
Yb	....	....	—	—	....	....	—	....	—	....	—	.0003
B	....	....	—	—	....	....	.006	....	.002	....	.002	.002
Be	....	....	—	—	....	....	.0005	....	—	....	—	—
Sr	....	....	.06	.1	....	....	.02	....	.05	....	.03	.06
Ba	....	....	.03	.05	....	....	.09	....	.02	....	.05	.02
Pb	....	....	.001	—	....	....	.005	....	—	....	—	—
Mo	....	....	—	—	....	....	—	....	—	....	—	.0006
Cu	....	....	.01	.008	....	....	.004	....	.009	....	.006	.005
V	....	....	.02	.02	....	....	.001	....	.02	....	.01	.02
Cr	....	....	—	.003	....	....	.0003	....	.0007	....	.007	.01
Ni	....	....	—	.001	....	....	—	....	.001	....	.004	.003
Co	....	....	.002	.002	....	....	—	....	.002	....	.002	.003
Nb	....	....	—	—	....	....	—	....	—	....	—	.002
Total	....	....	.141	.2017	....	....	.1618	....	.1167	....	.1208	.1409
NORMS												
Q	4.8	6.7	7.7	8.3	14.5	21.5	25.2	27.0	5.1	6.0	11.3	9.2
C	—	—	—	—	—	—	—	—	—	—	—	—
or	7.8	7.5	7.[illegible]	8.9	15.6	17.8	24.6	24.5	6.1	9.4	8.3	10.0
ab	30.9	29.6	32.5	33.5	38.8	36.1	39.3	39.8	28.8	20.4	24.6	30.4
an	24.7	23.6	19.7	20.0	15.6	10.3	4.4	2.8	30.6	27.0	32.3	26.4
ne	—	—	—	—	—	—	—	—	—	—	—	—
di wo	5.5	6.6	4.7	4.8	1.0	1.2	1.2	1.2	2.9	4.4	2.2	2.1
di en	2.4	3.9	1.9	1.9	0.3	0.3	0.1	0.17	1.3	3.1	1.3	1.2
di fs	3.1	2.4	2.8	2.8	0.8	0.9	1.2	1.1	1.6	0.9	0.8	0.8
di (sum)	11.0	12.9	9.4	9.5	2.1	2.4	2.5	2.47	5.8	8.4	4.3	4.1
hy en	5.9	6.1	5.5	5.4	2.7	0.9	0.2	0.03	8.2	18.9	8.7	8.3
hy fs	7.4	3.9	7.8	7.8	6.2	3.6	2.4	0.22	9.5	5.3	5.3	5.0
hy (sum)	13.3	10.0	13.3	13.2	8.9	4.5	2.6	0.25	17.7	24.2	14.0	13.3
ol fo	—	—	—	—	—	—	—	—	—	—	—	—
ol fa	—	—	—	—	—	—	—	—	—	—	—	—
mt	4.4	6.2	4.2	2.9	2.1	3.0	0.9	2.1	2.6	3.0	3.0	3.3
il	2.4	2.9	4.7	2.9	1.5	1.2	0.4	0.4	2.4	1.2	1.5	2.3
hm	—	—	—	—	—	—	—	—	—	—	—	—
ap	0.8	0.6	1.6	0.8	0.3	0.3	0.1	0.1	0.7	0.3	0.3	1.0
cc	—	—	—	—	—	—	—	—	—	—	—	—
Total	100.1	100.0	100.3	100.0	99.4	97.1	100.0	99.42	99.8	99.9	99.6	100.0
NIGGLI VALUES												
si	148	146	155	170	236	286	372	384	148	141	167	169
al	26	25	25	27	35	36	42	42	29	23	31	30
fm	38	40	41	37½	27	24½	13	13	37	47½	34	35
c	24	24	22	21½	15	13	8	7	23	21	24	22
alk	12	11	12	14	23	26½	37	38	11	8½	11	13
k	.19	.19	.17	.20	0.27	.32	.37	.37	0.17	0.30	0.24	0.24
mg	.35	.40	.31	.35	0.25	.13	.05	.05	0.42	0.70	0.51	0.48
qz	0	2	7	14	44	80	124	134	4	7	23	17

	25	26	27	28	29	30	31	32	33	34	35
	Southwestern Umnak									Bogoslof	
MAJOR OXIDES											
SiO_2	60.6	61.3	61.4	64.4	65.6	65.6	68.2	75.4	76.0	46.6	61.0
Al_2O_3	15.4	16.3	16.5	16.0	14.1	15.6	11.4	13.0	12.8	18.5	18.6
Fe_2O_3	2.7	2.1	2.6	2.1	4.5	2.1	2.3	0.5	0.0	6.1	3.9
FeO	5.6	6.0	5.4	4.1	2.2	3.4	6.0	0.8	1.3	5.0	1.2
MgO	2.0	1.6	2.2	1.2	2.0	0.71	3.8	0.22	0.09	5.4	1.1
CaO	3.5	5.6	5.6	4.2	2.8	3.4	0.94	1.2	0.91	11.9	6.5
Na_2O	5.4	4.6	4.3	4.5	6.1	4.2	3.5	3.5	3.5	2.6	4.2
K_2O	2.2	1.7	1.6	2.6	1.5	2.8	0.51	3.9	4.7	1.6	2.9
Ignition[b] H_2O+	1.07	—	—	—	—	0.81	—	—	—	—	—
Ignition[b] H_2O-	0.31	-0.51[c]	-0.29[c]	-0.11[c]	1.4	0.31	3.1	2.2	0.48	-0.29[c]	0.08
Ignition[b] CO_2	0.07	—	—	—	—	0.07	—	—	—	—	—
TiO_2	1.0	1.0	1.1	0.82	0.75	0.78	0.72	0.16	0.18	1.4	0.53
P_2O_5	0.43	0.42	0.18	0.23	0.20	0.27	0.08	0.06	0.02	0.36	0.28
MnO	0.15	0.20	0.17	0.16	0.11	0.12	0.24	0.02	0.02	0.17	0.16
Total	100.43	100.82	101.05	100.31	101.26	100.17	100.79	100.96	100.0	99.63	100.45
Powder Sp. Gr.	2.76	2.59	2.67	2.59	2.71	2.48	2.71	2.46	2.61	2.86	2.60
MINOR ELEMENTS[e]											
F	....	....	....	....	....	.06	....	.04	....	....	.08
Cl	....	....	....	....	....	.05	....	.06	....	....	.11
S	....	....	....	....	....	.08	....	.07	....	....	.02
Zr	.008	....	....	....	....	.02	....	.008	.02	.006	.009
Ga	.001	....	....	....	....	.001	....	.0008	.0009	.001	.002
La	—	....	....	....	....	—	....	—	—	—	—
Sc	—	....	....	....	....	—	....	—	.0003	—	.0002
Y	.004	....	....	....	....	.006	....	.002	.003	.004	.0009
Yb	—	....	....	....	....	—	....	—	.0003	—	.00009
B	—	....	....	....	....	.002	....	.008	—	—	.001
Be	—	....	....	....	....	—	....	—	—	—	—
Sr	.03	....	....	....	....	.03	....	.02	.01	.08	.07
Ba	.06	....	....	....	....	.06	....	.07	.05	.06	.1
Pb	—	....	....	....	....	—	....	—	—	—	—
Mo	—	....	....	....	....	—	....	—	—	—	.0002
Cu	.003	....	....	....	....	.003	....	.0008	.0008	.01	.0007
V	.02	....	....	....	....	.002	....	—	.002	.03	.008
Cr	.0003	....	....	....	....	—	....	—	.0001	.002	.0002
Ni	.001	....	....	....	....	—	....	—	.0001	.003	.0001
Co	.001	....	....	....	....	.0007	....	—	.0001	.002	.0008
Nb	—	....	....	....	....	—	....	—	—	—	—
Total	.1283	....	....	....	....	.1266	....	.1096	.0876	.1980	.1932
NORMS											
Q	9.5	12.6	14.0	16.[illegible]	17.2	21.3	35.2	37.5	35.0	—	12.4
C	—	—	—	—	—	0.2	3.8	1.0	0.5	—	—
or	12.8	10.0	9.5	15.6	8.9	16.7	2.8	22.8	27.8	9.4	17.2
ab	45.6	38.8	36.2	38.3	51.4	35.6	29.3	29.3	29.3	18.7	35.6
an	11.4	18.9	21.1	15.6	6.7	14.7	3.9	5.6	4.2	33.9	23.1
ne	—	—	—	—	—	—	—	—	—	1.9	—
di wo	1.2	2.6	2.4	1.6	2.7	—	—	—	—	9.6	3.0
di en	0.5	0.9	1.2	0.7	2.3	—	—	—	—	7.4	2.6
di fs	0.7	1.7	1.2	0.9	—	—	—	—	—	1.2	—
di (sum)	2.4	5.2	4.8	3.2	5.0					18.2	5.6
hy en	4.5	3.1	4.3	2.3	2.7	1.8	9.5	0.5	0.2	—	0.1
hy fs	5.9	6.2	5.0	3.8	—	3.4	8.3	0.8	2.0	—	—
hy (sum)	10.4	9.3	9.3	6.1	2.7	5.2	17.8	1.2	2.2		0.1
ol fo	—	—	—	—	—	—	—	—	—	4.3	—
ol fa	—	—	—	—	—	—	—	—	—	0.7	—
ol (sum)										5.0	
mt	3.9	3.0	3.7	3.0	5.3	3.0	3.3	0.7	—	8.8	2.5
il	2.0	2.0	2.1	1.5	1.4	1.5	1.4	0.3	0.5	2.7	1.1
hm	—	—	—	—	0.8	—	—	—	—	—	1.9
ap	1.0	1.0	0.3	0.5	0.4	0.7	0.3	0.2	0.07	0.8	0.7
cc	—	—	—	—	—	0.2	—	—	—	—	—
Total	99.0	100.8	101.0	100.3	99.8	99.1	97.8	98.7	99.3[illegible]	99.4	100.2
NIGGLI VALUES											
si	207	203	200	240	248	270	286	471	479	105	204
al	31	32	31½	35	31½	38	28	48	47	24½	37
fm	33½	30	32	26	31½	23	52½	8	7½	38	19
c	13	20	19½	17	11	15	4	8	6	29	24
alk	22½	18	17	22	26	24	15½	36	39½	8½	20
k	0.21	.20	.20	.28	.14	0.31	.08	0.42	.47	0.29	0.31
mg	0.30	.26	.34	.26	.36	0.18	.45	0.23	.10	0.48	0.25
qz	17	27	32	50	44	74	124	227	285	-29	24

a/ Analysts and rocks analyzed (indicated by numbered columns) are as follows: F. M. Byers, Jr.: major oxides in 14 and 19; F. M. Byers, Jr., W. W. Hommel and M. K. Carron: major oxides in 2, 6, 8, 9, 10, 11, 13, 15, and 16; M. K. Carron: major oxides in 4 and 20; Leonard Shapiro and W. W. Brannock: major oxides by rapid methods in 5, 12, 21, 22, 23, 24, 25, 30, 32, 34, and 35; S. M. Berthold, R. L. Hill, and Leonard N. Shapiro: major oxides by rapid methods in 1, 3, 8, 17, 18, 26, 27, 28, 29, and 33; K. J. Murata: minor elements (with exception of volatiles) in 6, 10, 11, 15, 16, and 19; A. T. Myers: minor elements (with exception of volatiles) in 5, 12, 21, 23, 25, 30, 32, and 34; A. Chodos: minor elements (with exception of volatiles) in 4, 24, 33, and 35; A. C. Vlisidis: volatile elements, F, Cl, and S, in 24, 30, 32, and 35.

b/ Includes gain due to oxidation of FeO.

c/ Gain due to oxidation of FeO greater than losses of volatile constituents; not included in totals.

d/ Inferred from bulk specific gravity.

e/ Also looked for but not found within the limits of spectrographic determination for the particular element: Ag, Cd, Zn, Sn, As, Sb, Bi, Ge, In, Tl, and Re.

1. Olivine basalt flow (45 - 95) of mafic basalt flows at Cape Idak (Lat. 53° 31.4' N., Long. 167° 47.8' E.).
2. Plagioclase - olivine basalt flow (46 ABy 92) of Mt. Tulik. Lat. 53° 22.4' N., Long. 167° 04.3' E., 3,000 feet S. 80° W. of summit.
3. Palagonitized basaltic andesite tuff cone (46 ABy 132) of early eruptives within Okmok caldera. Lat. 53° 26.4' N., Long. 168° 05.0' E., 1 mile NE. of Cone D. Specimen collected from palagonitized bed near summit.
4. Anorthite - augite - olivine basalt flow (46 AFr 28) of mafic basalt flows. Lat. 53° 25.7' N., Long. 167° 55.5' E., 3 miles N. 25° W. of Umnak Airfield. Specimen collected from lower middle of flow.
5. Anorthite basalt flow (46 ABy 609) near Inanudak Bay. Specimen collected at Lat. 53° 17.7' N., Long. 168° 21.3' E., from sea cliff S. 25° E. of cinder cone.
6. Anorthite basalt flow (46 ABp 68) extruded in December 1945 from cone A. Lat. 53° 24.7' N., Long. 168° 11.0' E., 6,000 feet NW of cone.
7. Bytownite basalt flow (46 ABy 29), a subaerial flow of Cone D. Specimen collected at Lat. 53° 25.6' N., Long. 168° 05.8' E., on SSE. slope, altitude 1,900 feet.
8. Palagonitized andesitic scoria bed (45 -73) from palagonitized pyroclastic rocks of northeastern Umnak. Lat. 53° 21.2' N., Long. 168° 17.0' E.
9. Augite basalt flow (4o ABy 70) of mafic basalt flows in lower part of Okmok caldera wall. Lat. 53° 27.3' N., Long. 168° 05.5' E.
10. Basalt flow (46 ABy 45) at Crater Creek gorge. Lat. 53° 28.5' N., Long. 168° 05.0' E. in northwest wall.
11. Basalt flow (46 ABy 54) at Crater Creek gorge. Lat. 53° 28.7' N., Long. 168° 04.6' E. in northwest wall.
12. Hydrothermally altered plagioclase basalt (47 ABy 44) or basaltic andesite flow from basement volcanic complex. From cliff (Lat. 53° 17.1' N., Long. 168° 19.8' E.) just south of Air Force hut near Inanudak Bay.
13. Lower welded andesitic agglomerate bed (46 ABy 13) in pyroclastic member of Okmok formation exposed in upper part of north wall (Lat. 53° 28.3' N., Long. 168° 08' E.) of Okmok caldera. Sample taken to exclude most foreign lithic fragments.
14. Older basaltic andesite flow (46 ABy 6) from Cone B in Okmok caldera. Near front of flow at Lat. 53° 27.6' N., Long. 168° 07' E.
15. Aphyric andesite pipe (46 ABy 63) of vitreous andesite. Near top of pipe (Lat. 53° 28.0' N., Long. 168° 05.4' E.) at intersection of SE. wall of Crater Creek gorge and Okmok caldera.
16. Upper welded andesitic agglomerate bed (46 ABy 15) in pyroclastic member of Okmok formation exposed in upper part of north wall (Lat. 53° 28.3' N., Long. 168° 08' E.) of Okmok caldera. Sample taken to exclude most foreign lithic fragments.
17. Vitreous latite fragment (46 AFr 2) in pyroclastic member of Okmok formation. From bank of Crater Creek (Lat. 53° 32.6' N., Long. 167° 59.2' E.) near Cape Tanak.
18. Rhyodacite pumice lapilli bed (47 ABy 26) near base of pyroclastic member of Okmok formation. Sea cliff (Lat. 53° 33.5' N., Long. 168° 04.9' E.) 0.6 mile S. 10° E. of Ashishik Point.
19. Rhyolite obsidian band (46 ABy 30a) in banded part of northeastern Umnak rhyolite dome (Lat. 53° 29.5' N., Long. 168° 10.3' E.).
20. Felsitic rhyolite facies (48 Um 11) in east end of northeastern Umnak rhyolite dome (Lat. 53° 29.4' N., Long. 168° 09' E.).
21. Basaltic andesite flow (47 ABy 73) of Mt. Vsevidof from Twin Lava Point (Lat. 53° 11.1' N., Long. 168° 47.7' E.).
22. Quartz-bearing olivine andesite flow (47 ABy 10). North-facing cliff (Lat. 53° 13.6' N., Long. 168° 21.9' E.), south of Hot Springs Cove.
23. Hypersthene-bearing labradorite andesite flow (47 ABy 9) of Mt. Recheschnoi. Lat. 53° 13.8' N., Long. 168° 22.0' E., S. of Hot Springs Cove.
24. Quartz diorite (47 ABy 41) facies of plutonic rocks (Lat. 53° 16.1' N., Long. 168° 34.9' E.), 1½ miles S. 70° E. of Cape Ilmalianuk.
25. Albite diorite (47 ABy 34) in albitized sedimentary and igneous complex. Specimen collected from shoreline (Lat. 52° 51.8' N., Long. 169° 00.1' E.) S. of Elbow Hill.
26. Andesitic glass facies (47 ABy 72) in dark scoria bed of Mt. Vsevidof cone. Specimen collected at an altitude of 4,000 feet on N. slope of cone (Lat. 53° 07.7' N., Long. 168° 41.3' E.).
27. Hypersthene-bearing andesite flow (47 ABy 57) of Mt. Recheschnoi. South slope at Lat. 53° 05.3' N., Long. 168° 28.5' E.
28. Historic(?) latite flow (47 ABy 36) of Mt. Vsevidof. Front of flow (Lat. 53° 07.7' N., Long. 168° 46.6' E.) on W. slope of Mt. Vsevidof.
29. Quartz keratophyre (47 ABy 29) in albitized sedimentary and igneous complex. From headland (Lat. 53° 02.4' N., Long. 168° 30.0' E.) E. of Amos Bay.
30. Rhyodacite pumice bed (47 ABy 67) that forms uppermost bed of Mt. Vsevidof cone. Altitude, 1,700 feet on N. slope of cone (Lat. 53° 09.7' N., Long. 168° 41.7' E.).
31. Argillite bed (47 ABy 54) in albitized sedimentary and igneous complex. From bedded sequence (Lat. 53° 07.7' N., Long. 168° 22.4' E.), one mile SW. of Russian Bay.
32. Rhyolite dome (47 ABy 28). From middle dome (Lat. 53° 10.2' N., Long. 168° 25.1' E.) on W. side of valley that drains into Russian Bay.
33. Granophyre dike (47 ABy 39A) that cuts plutonic rocks. From sea cliff (Lat. 53° 16.2' N., Long. 168° 36.9' E.) 3/4 mile SW of Cape Ilmalianuk.
34. Bytownite - salite - hornblende basalt dome (47 ABy 100) extruded in 1927. Specimen collected at Lat. 53° 56.1' N., Long. 168° 02.5' E.
35. Andesine - hornblende andesite dome (47 ABy 103) (Old Bogoslof) extruded in 1796. Specimen collected in saddle (Lat. 53° 55.8' N., Long. 168° 02.3' E.) at an altitude of 100 feet.