

**ROUGH DRAFT**—currently in **forths-123-spreadsheet-format**, here imported into **MS-Excel**, G.S.A. Data Repository for Erslev, E.A., 1998, Limited, localized non-volatile element and volume flux in Appalachian slates: Geological Society of America Bulletin, Whole rock XRF results as reported by XRAL, Inc. and Colgate University (for Cedar Point Quarry and New York samples only)

Locality: Martinsburg Formation, Big Bed Quarry, Slatedale, PA  
Latitude: 40°04'5"N

SAMPLE#	SAMPLE DESCRIPTION WITH FIGURE	NA2O	MGO	AL2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	Fe2O3	Rb	SR	Y	Zr	NB	Ba	C	S	LOI	SUM
		%	%	%	%	%	%	%	%	%	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	
	INDIVIDUAL STATE SAMPLES (Fig. 17a)																				
C7-A	Bed#20, backlimb	0.81	2.74	16.2	53.7	0.19	3.82	5.36	0.784	0.08	6.77	145	285	30	119	35	777	1.75	0.61	7.55	98.2
C8-A	Bed#20, backlimb	1.25	2.95	16.5	57.3	0.17	3.81	3.06	0.834	0.07	6.73	152	122	30	170	31	788	5.90	98.7	7.50	99.0
C9-A	Bed#20, backlimb	0.83	2.70	15.9	54.7	0.18	3.71	5.73	0.774	0.08	6.71	138	287	31	120	41	729	7.50	99.0	7.70	99.0
C10-A	Bed#20, backlimb	0.82	2.72	15.9	54.9	0.18	3.72	5.50	0.781	0.08	6.58	142	277	31	133	32	746	7.55	98.5	7.70	99.0
C11-A	Bed#20, backlimb	0.82	2.70	15.9	54.4	0.19	3.77	5.58	0.786	0.08	6.59	150	277	31	131	28	762	7.55	98.5	7.70	99.0
C12	Bed#20, backlimb	1.06	2.78	15.7	59.5	0.16	3.42	5.50	0.789	0.08	7.40	120	170	41	173	39	759	5.75	100.1	6.51	100.1
C13	Bed#20, hinge	0.85	2.66	16.0	55.6	0.19	3.77	5.45	0.789	0.08	6.61	139	261	12	117	16	763	1.69	0.45	7.70	99.8
C14-A	Bed#20, overturned	0.82	2.73	16.2	53.9	0.19	3.82	5.41	0.794	0.08	6.66	131	281	36	130	30	749	1.82	0.58	7.55	98.3
C15-A	Bed #XX10, backlimb	1.16	2.29	12.4	58.9	0.19	2.74	7.71	0.657	0.08	5.47	129	264	116	29	569	2.78	0.89	7.30	99.6	
C16-A	Bed #XX10, backlimb	1.18	2.14	12.3	63.4	0.19	2.77	4.93	0.668	0.08	5.15	112	230	11	110	26	597	6.70	99.6	9.95	98.0
C17-A	Bed #XX10, hinge	1.20	1.99	12.1	62.7	0.18	2.70	5.21	0.637	0.10	5.54	107	200	15	106	34	496	1.20	0.21	3.96	100.0
C18-A	Bed #XX10, backlimb	1.16	2.35	12.4	59.3	0.20	2.92	5.43	0.663	0.07	5.24	101	182	116	27	550	2.24	0.69	6.85	98.2	
C20-A	Bed #XX10, overturned	1.17	2.21	12.4	61.1	0.19	2.79	5.67	0.667	0.08	5.38	111	271	13	118	24	568	7.15	98.7	7.30	99.1
C22-A	Bed #XX10, overcurved	1.13	2.24	12.2	60.1	0.19	2.75	5.85	0.671	0.09	5.42	102	273	26	123	19	555	2.82	0.87	7.50	98.4
	Lower, hard slate (not plotted)	0.47	4.02	12.2	55.2	0.09	3.63	7.35	0.296	0.19	4.62	135	242	23	122	15	635	11.50	99.7		
	GRADED BEDS IN NORMAL LIMB (Fig. 4)																				
93-11	Bed#XX10, sandy base	2.77	3.94	20.4	53.0	0.23	3.40	0.68	0.691	0.04	8.93	126	74	35	493	31	934	3.88	98.4	3.85	97.8
93-13B	Bed#XX10, lower middle	2.56	2.52	19.8	56.6	0.21	4.33	1.20	0.649	0.04	4.63	151	137	40	281	35	929	4.15	99.0	4.15	99.0
93-13A	Bed#XX10, upper middle	1.75	1.93	17.1	63.8	0.12	4.12	1.12	0.516	0.04	3.28	171	76	206	29	929	3.88	98.4	3.88	98.6	
93-12	Bed#XX10, stony top	1.69	2.13	17.4	63.4	0.13	4.33	1.98	0.655	0.04	3.94	170	53	24	205	27	939	9.05	99.1	9.05	99.1
93-18	Big Bed #2, sandy base	1.97	2.21	19.5	60.3	0.13	4.91	9.17	0.440	0.15	4.66	413	12	218	30	311	5.90	99.0	5.90	99.0	
93-19	Big Bed #2, middle	1.35	2.66	15.2	59.3	0.15	3.42	4.11	0.742	0.08	5.95	140	175	27	191	24	698	6.45	98.5	6.45	98.5
93-20	Big Bed #2, slaty top	1.12	2.83	15.9	57.0	0.15	3.69	3.98	0.772	0.08	6.42	152	164	26	146	31	733	1.45	0.67		
	GRADED BEDS IN OVERTURNED LIMB (Fig. 4)																				
93-23	Big Bed #2, sandy base	1.71	2.38	11.0	58.9	0.14	1.98	8.61	0.528	0.13	4.90	74	416	31	284	26	356	8.95	99.4	6.50	98.8
93-22	Big Bed #2, middle	1.24	2.72	15.4	57.7	0.15	3.58	4.69	0.750	0.09	5.85	129	219	32	178	36	695	1.52	0.67	6.45	98.1
93-21	Big Bed #2, slaty top	1.15	2.87	15.8	56.5	0.15	3.66	4.17	0.768	0.09	6.34	157	170	25	148	20	695	1.52	0.67	6.45	98.1
	Locality: Martinsburg Formation, road cut on Rte. 46 northeast of Belvidere, NJ																				
	Latitude: 40°05'N																				
	CLEAVAGE-MICROLITHON PAIRS (Fig. 2a)																				
DG2-2	C1 cleavage zones next to DG2-2B	0.66	3.29	18.1	49.8	0.17	5.34	2.33	0.880	0.10	8.19	221	130	45	346	32	1020	2.87	2.29	9.10	98.2
DG2-2B	Microlithon	1.05	2.24	10.7	66.0	0.13	2.73	3.08	0.427	0.12	4.93	101	278	23	152	18	542	2.13	1.08	5.55	98.0
C22C	Cleavage zones next to C22M	1.60	2.18	16.0	49.3	0.16	4.08	3.79	0.408	0.08	5.66	262	198	22	1310	31	638	87.6	92.6		
C22M	Microlithon	1.00	1.59	8.0	68.4	0.11	1.61	3.35	0.408	0.09	5.06	85	102	16	102	15	638	4.75	100.0	4.75	100.0
DGIN	Inner fold arc (Fig. 1b)	0.93	2.50	11.8	58.8	0.17	3.21	6.67	0.593	0.14	5.18	121	387	157	27	639	2.85	1.29	8.15	98.3	
DGOUT	Outer fold arc (Fig. 1b)	1.14	2.72	13.1	59.1	0.18	3.40	4.92	0.657	0.14	5.85	150	276	202	39	714	2.68	1.21	7.30	98.7	
	INDIVIDUAL ANALYSES (Figs. 17b, 19b)																				
95-6	State F in Figs.	0.50	3.65	21.4	55.0	0.16	5.82	1.35	0.952	0.05	5.22	233	84	23	160	22	1090	6.05	100.3		
95-7	State G in Figs.	0.55	3.49	20.9	55.7	0.19	5.91	1.10	0.929	0.04	4.95	261	81	27	157	20	1000	6.10	100.0		
95-8	State C in Figs.	0.35	4.45	25.6	48.0	0.25	6.50	0.78	1.090	0.05	6.50	279	74	31	198	22	1310	6.45	100.3		
95-9	State M in Figs.	0.76	2.60	13.5	68.7	0.15	3.50	1.59	0.553	0.05	3.67	16	102	15	638	4.75	100.0				
95-10	State D in Figs.	0.32	4.36	23.8	49.4	0.23	6.78	1.28	1.010	0.05	6.25	282	84	26	1230	21	1100	6.55	100.2		
95-11	State E in Figs.	0.61	4.21	21.7	52.4	0.20	5.78	1.67	0.931	0.07	6.05	232	100	24	165	20	1000	6.45	100.3		
95-12	State A in Figs.	0.21	5.52	25.2	42.8	0.27	6.80	0.85	1.170	0.12	9.26	281	70	41	210	25	1450	7.80	100.2		
95-13	State B in Figs.	0.17	4.93	22.8	47.3	0.26	6.59	1.45	0.906	0.17	7.96	266	117	16	170	16	4040	7.15	100.2		
95-14	State T in Figs.	0.70	2.70	13.2	63.2	0.15	3.36	3.09	0.637	0.11	6.52	144	156	25	167	17	633	6.70	100.5		
95-15	State H in Figs.	1.33	2.73	16.3	62.7	0.14	4.13	1.98	0.741	0.06	4.64	181	122	20	140	14	722	5.10	100.0		
95-16	State K in Figs.	1.20	2.51	3.5	65.6	0.14	1.89	0.649	0.07	5.15	125	138	16	156	16	596	5.30	100.1			
95-17	State L in Figs.	1.17	2.31	13.6	65.9	0.15	3.30	1.62	0.653	0.08	5.91	150	103	27	159	12	586	5.25	100.1		
95-18	State J in Figs.	0.95	2.46	15.4	64.4	0.15	3.74	0.57	0.734	0.05	6.39	169	60	32	161	15	689	5.50	100.5		

Locality: Martinsburg Formation, road cut on Rte. 46 southeast of Columbia, NJ

Latitude: 40°05'N

INDIVIDUAL SLATE BED SAMPLED APPROACHING FOLD	(Fig. 17b)	1.58	2.98	13.7	61.9	0.14	2.47	4.07	0.754	0.09	6.53	111	127	25	211	18	422	5.95	100.3
C24	Slate farthest from fold	1.28	3.04	14.5	59.0	0.14	2.92	4.83	0.773	0.09	6.84	132	158	32	192	17	501	6.55	100.1
C25	Slate	1.23	2.90	14.4	59.9	0.14	2.75	4.67	0.739	0.09	6.83	117	150	30	182	15	514	6.55	100.3
C26	Slate nearest to fold	1.31	2.99	15.1	59.1	0.15	2.99	4.27	0.779	0.07	7.08	135	120	33	199	29	475	6.30	100.3
C27																			

Locality: Martinsburg Formation, road cut at intersection of Bridgewater Road and I-76 west of Harrisburg, PA  
Latitude: 40°04'N

SLATE TRENCH SAMPLE (Fig. 17a)	0.95	3.00	15.8	60.8	0.16	3.97	0.46	0.924	0.07	6.72	153	59	11	161	30	604	5.00	98.0		
SLATE TRENCH SAMPLE (Fig. 17a)	1.19	3.15	15.5	61.6	0.17	3.67	1.30	0.915	0.10	6.82	157	65	21	174	38	508	5.25	99.8		
SLATE TRENCH SAMPLE (Fig. 17a)	1.19	3.08	15.7	60.9	0.17	3.76	0.57	0.919	0.11	7.29	161	74	33	185	21	1050	5.20	99.1		
SLATE TRENCH SAMPLE (Fig. 17a)	0.95	3.09	16.5	59.2	0.16	4.11	0.27	0.937	0.08	7.96	168	56	32	179	30	689	5.85	99.2		
SLATE TRENCH SAMPLE (Fig. 17a)	1.01	2.89	16.1	60.1	0.16	3.90	0.33	0.909	0.11	7.86	152	51	13	174	34	488	5.70	99.2		
GRAYWACKE TRENCH SAMPLE (Fig. 17a)	1.48	3.27	12.2	59.4	0.20	3.77	4.41	0.765	0.21	6.88	128	27	15	500	7.05	98.3				
GRAYWACKE TRENCH SAMPLE (Fig. 17a)	1.41	3.33	13.6	60.8	0.19	2.83	3.39	0.812	0.16	7.05	113	31	56	502	6.30	100.0				
SLATE AT NEARBY OUTCROP (Fig. 17a)	0.98	3.28	15.7	59.5	0.15	3.66	1.47	0.904	0.10	7.80	169	32	34	532	5.70	99.4				
SLATE AT NEARBY OUTCROP (Fig. 17a)	1.28	2.47	16.0	63.1	0.12	3.34	0.81	1.090	0.04	6.38	142	78	51	196	27	573	5.50	100.3		

Locality: Halifax Formation, Blue Rocks east of Lunenburg, Nova Scotia  
Latitude: 44°02'N

#### INDIVIDUAL SLATE ANALYSES

M1	Slate	0.97	1.21	18.6	66.6	0.08	3.57	0.21	0.927	0.08	4.16	187	170	162	43	816	3.35	99.9	
M2	Slate	0.83	1.17	17.0	65.1	0.07	3.48	0.13	0.863	0.06	4.89	184	157	127	33	792	2.95	98.8	
M3	Slate	1.26	1.23	18.8	65.3	0.09	3.76	0.24	1.000	0.08	4.23	190	162	194	40	836	3.20	99.1	
M5	Slate	1.12	1.74	22.1	58.9	0.10	3.86	0.09	0.979	0.18	6.98	181	164	206	38	904	4.25	100.5	
NV5	Slate	1.19	1.44	25.4	53.5	0.09	5.02	0.09	0.976	0.16	6.07	244	368	20	125	21	1120	4.45	98.6

#### CLEAVAGE-MICROLITHON PAIRS (FIG. 2a)

NV1A	Cleavage zones next to NV1B	1.09	1.90	25.6	51.2	0.16	5.46	0.25	1.320	0.08	8.13	263	222	77	278	45	1240	4.90	100.4
NV1B	Microolithon	0.93	1.27	15.9	67.0	0.12	3.48	0.13	0.750	0.08	5.36	183	144	44	132	52	848	3.20	99.4
NV8A	Cleavage zones next to NV8B	1.36	1.81	22.0	57.0	0.13	4.23	0.17	1.070	0.11	7.11	197	149	38	212	27	896	4.00	99.2
NV8B	Microolithon	1.07	1.47	18.2	64.9	0.10	3.49	0.14	0.814	0.10	5.90	159	141	38	156	19	792	3.20	99.5
NV11C	Cleavage zones next to NV11M	0.95	1.80	56.8	52.1	0.13	5.34	0.25	1.390	0.11	7.18	155	141	200	99	94.1	99.5		
NV11M	Microolithon	0.71	1.29	16.2	69.0	0.09	3.24	0.10	0.664	0.09	5.21						96.6		

#### FOLD 1 (FIGS. 13, 15)

NV7A	Bed #1	0.89	1.42	23.8	57.3	0.12	5.25	0.18	0.986	0.08	5.70	262	219	20	136	24	1190	4.15	100.1
NV7B	Bed #1, small fold hinge	0.94	1.10	17.6	67.7	0.10	3.78	0.12	0.757	0.07	4.33	186	183	18	99	31	899	0.22	0.01
NV7C	Bed #1	0.93	1.84	30.2	43.7	0.16	6.56	0.13	1.310	0.10	7.56	269	239	45	1470	0.4	0.02	5.60	98.9
NV7D	Bed #1	1.08	1.72	23.2	55.5	0.14	4.72	0.15	1.040	0.10	7.26	208	205	35	196	33	1080	0.27	0.01
NV7E	Bed #1, large fold hinge	1.07	1.82	23.4	54.6	0.15	4.80	0.17	1.050	0.10	7.62	232	210	33	186	42	1090	4.20	99.2
NV7F	Bed #2, large fold hinge	0.99	1.56	23.4	54.7	0.12	4.97	0.12	0.972	0.09	6.32	220	210	40	143	21	1120	4.15	99.9
NV7G	Bed #2	0.93	1.55	23.8	56.4	0.11	5.16	0.11	0.989	0.09	6.43	248	231	34	131	37	1160	4.15	99.9

#### FOLD 2 (FIGS. 13, 15)

NV7A	Hinge Limb	1.24	1.11	22.1	60.2	0.10	4.76	0.12	1.110	0.09	4.12	224	209	21	195	30	1010	3.70	98.8
NV7B	Limb	1.19	1.00	19.2	65.2	0.09	4.11	0.12	0.988	0.09	3.94	189	177	23	200	36	913	3.15	99.3
NV7C	Hinge Limb	1.34	0.97	20.6	62.8	0.09	4.39	0.09	1.020	0.08	4.13	217	184	15	206	35	935	3.40	99.9
NV7D	Limb	1.34	0.98	20.3	63.9	0.09	4.28	0.12	1.020	0.08	3.92	205	180	11	209	42	896	3.30	99.5

#### GRADED BED (FIG. 4)

NV10A	Metsandstone	1.78	2.17	17.6	59.5	0.13	2.40	0.16	0.656	0.21	10.50	105	94	35	239	21	558	3.65	98.9
NV10B	Slate	1.54	2.20	16.5	61.2	0.12	2.19	0.15	0.640	0.21	10.60	102	75	34	215	22	526	3.50	99.0

#### Locality: Goldenville Formation, Meguma Group, Tancook Island, Nova Scotia

Latitude: 44°02'N

GRADED BED (FIG. 4)		1.58	0.87	9.0	80.8	0.07	1.81	0.34	0.517	0.10	2.77	53	77	60	420	20	505	1.75	99.7		
NV12	Metsandstone	0.99	1.86	23.3	55.7	0.25	6.53	0.30	1.190	0.06	4.90	253	102	42	1540	3.70	99.0				
NV13	Sandy slate above NV12	0.88	2.07	55.6	61.1	0.11	5.58	0.28	0.990	0.30	2.03	505	29	164	32	179	3.70	99.9			
NV14	Metsandstone	0.52	1.97	20.4	56.7	0.09	5.59	0.07	0.899	0.71	7.91	204	42	37	136	30	1290	3.80	98.9		
NV15	Sandy slate above NV14	1.62	1.88	16.2	65.1	0.11	3.29	0.67	0.666	0.10	5.80	107	129	18	139	33	181	2.95	99.5		
NV16	Metsandstone	1.15	1.67	22.7	56.5	0.11	6.62	0.12	1.270	0.											

