Geochemical data from the Brewer mine, Chesterfield County, South Carolina

by

Henry Bell

The U.S. Bureau of Mines investigated the Brewer mine, Chesterfield County, South Carolina to determine the grade and extent of the topaz deposits there for possible use in the production of mullite and calcium fluoride. Ten diamond drill holes totaling 2,344 feet were completed and the drill core analyzed. The results of this work including sections through the diamond-drill holes were published in August 1953, by A. L. Peyton and V. J. Lynch as U.S. Bureau of Mines, Report of Investigations 4992, titled "Investigation of the Brewer Topaz Deposit, Chesterfield County, S.C.".

Although the Brewer mine was principally a gold mine no analyses were made by the Bureau of Mines for gold or other metals. In the pursuit of geochemical studies in the Southeastern Piedmont by the U.S. Geological Survey, the drill-core from the Bureau of Mines drilling, stored in Milwaukee, Wisconsin, was sampled. Grab samples from the intervals indicated by the Bureau of Mines drill logs were collected. Semi-quantitative spectrographic analyses by the 6-step method for thirty elements and gold analyses by atomic absorption using a 10 gram sample were made on the samples in the laboratories of the Field Services Section, U.S. Geological Survey, Denver, Colo. The results of the analyses are included in table 1 and table 2.

Table 1.-- Semiquantitative spectrographic analyses of drill-core; Brewer mine, Chesterfield Co., South Carolina.

Table 2.-- Gold analyses of drill core, Brewer mine, Chesterfield Co., South Carolina

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The sample numbers, such as Br 1-105, Br 1-119, Br 1-143, indicate the drill-hole number and the bottom footage of the interval sampled as indicated in the Bureau of Mines drill logs. The location of the drill holes are shown in R.I. 4992.

At the time the drill-core was sampled for spectrographic analyses and gold analyses, the core was very fragmented and the precise footage at which the sample was taken was impossible to determine. The sampling is certainly biased towards harder rocks, less fractured rocks and probably less mineralized portions of the core.

Table 1:-- Semiquantitative spectrographic analyses of drill-core; Brewer mine, Chesterfield Co., South Carolina

FILM NO. 3-144-9

REPORT NO. 60046

SEMI-QUANTITATIVE SPECTROGRAPHIC - FIELD SERVICES SECTION
ANALYSIS
6 - Step D.C. Arc

Requested by Henry Bell

Date 11/6/73

Sheet #1

	(.05) Fe %		(.02) Mg %		(.05) Ca %		(.002) Ti %		(10) Mn		(.5) Ag		(200) As		(10) Au		(10) B		(20) Ba	DMW	Tag No.	11	Field No.
	1	2-7	8	9-14	15	16-21	22	23-28	29	30-35	36	37-42	43	44-49	50	51-56	57	58-63	64	65-70	71	72-77 78	79-80	//////////
1		2		.5		1		.2		300	N		N		N		L			1000		///////	11	G-1
2		2	L		L			1		10		1		700						20		KAD 530	11	Br 1-105
3		15			L			.7		15	N			200						100		531	11	Br 1-119
4	G	20			L			.3	L			2		700						70		532	11	Br 1-143
5		15			N			.3	L			.5		500						70		533	11	Br 1-155
6		20			N			.7	L		N			200						70		534	11	Br 1-159
7	G	20			L			.2	L			.5		200						70		535	11	Br 1-179
8		15			L			.5	L			.5		3000						50		536	11	Br 1-191
9		15			L			.5	L			1		700						50		537	11	Br 1-209
10		20			N			.3		10		2	N							50		538	11	Br 1-259
11		5			L			.5	N		N									70		539	11	Br 3-45
12		.5				.05		.5	N											500		540	11	Br 3-60
13		5				.05		.5	L											700		541	11	Br 3-80
14		5				.1		.5	N											300		542	11	Br 3-95
15		5			L			.7	L											100		543	11	Br 3-116
16		3						.5	L											300		544	11	Br 3-137
17		2						.5	N											150		545	11	Br 3-150
18		3						.3	L											500		546	11	Br 3-215
19		10						.3		10										500		547	11	Br 3-261
20		2						.5	L											70		548	11	Br 6-32
21		2						.5	L											500		549	11	Br 6-55
22		1						.5	L											500		550	11	Br 6-70
23	L		↓		↓			.5		10	↓		↓		↓		↓			700		551	11	Br 6-134
24		2	L		L			.5		15	N		N		N		L			300		552	11	Br 6-178

REMARKS

FILM NO. 3-4-9

REPORT NO. 60046

ANALYST G.W. Day

Sheet #2

	(1) Be		(10) Bi		(20) Cd		(5) Co		(10) Cr		(5) Cu		(20) La		(5) Mo		(20) Nb		(5) Ni		DMW	Tag no.		12	Field No.
	1	2-7	8	9-14	15	16-21	22	23-28	29	30-35	36	37-42	43	44-49	50	51-56	57	58-63	64	65-70	71	72-77	78	79-80	
1		3	N		N		N			70		20		100	N		N			5		////////		12	G-1
2	N			30			N		N			50	N			50	L			5		RAD 530		12	Br 1-105
3				500			N		N			700		20		50	N		L			531		12	Br 1-119
4				30			N		N			700		20		30			L			532		12	Br 1-143
5				50				20	N			700		20		50				10		533		12	Br 1-155
6				70				10		10		700		70		20				5		534		12	Br 1-159
7				70				50	N			2000		20		20				50		535		12	Br 1-179
8				200				30	N			10000		50		30				20		536		12	Br 1-191
9				50			N		N			300		50		50			L			537		12	Br 1-209
10				100				30		10		700		20		30				30		538		12	Br 1-259
11			N				N		N			20	N			7			L			539		12	Br 3-45
12												20		20	N							540		12	Br 3-60
13												20		70		7						541		12	Br 3-80
14												20		50		7						542		12	Br 3-95
15												50		20		7						543		12	Br 3-116
16												150		50		7						544		12	Br 3-137
17												100		50		10						595		12	Br 3-156
18									↓			50		20		50						546		12	Br 3-215
19									N			300		50		20						547		12	Br 3-261
20										20		20		20		30						548		12	Br 6-32
21										20		20		50		15						549		12	Br 6-56
22										20		10		30		20						550		12	Br 6-70
23	↓		↓		↓		↓			20		20		50	L		↓		↓			551		12	Br 6-134
24	N		N		N		N			10		20		20		30	N		L			552		12	Br 6-178

FILM NO. 3-#14-Q

REPORT NO. 60046

G= Greater than 10%, or Greater than value shown.
H = Interference
- = Not look for.

N = Not detected at limit of detection, or at value shown.
(Detected, but below limit of determination, or below value shown.
* = Usual limits of determinations do not apply due to use of dilution technique.

Sheet #3

	(10) Pb	Pd	Pt	(100) Sb	(5) Sc	(10) Sn	(100) Sr	Te	U	(10) V	DMW	Tag No.	13	Field No.
	1 2-7	8 9-14	15 16-21	22 23-28	29 30-35	36 37-42	43 44-49	50 51-56	57 58-63	64 65-70	71	72-77 78	79-80	//////////
1	70			N	N	N	200			15		///////	13	G-1
2	L			100	15	200	N			20		KAD 530	13	Br 1-105
3	30			N	15	30	1000			50		531	13	Br 1-119
4	20				10	50	N			50		532	13	Br-1-143
5	20				7	30	N			15		533	13	Br 1-155
6	50			↓	15	150	N			20		534	13	Br 1-159
7	50			N	7	20	100			15		535	13	Br 1-179
8	100			200	10	150	100			30		536	13	Br 1-191
9	30			N	10	70	N			20		537	13	Br 1-209
10	15				7	15	N			15		538	13	Br-1-259
11	30				10	N	N			70		539	13	Br-3-45
12	300				10		N			100		540	13	Br-3-60
13	500				10		700			70		541	13	Br 3-80
14	50				7		1000			70		542	13	Br-3-95
15	20				10		100			70		543	13	Br-3-116
16	10				7		N			70		544	13	Br-3-137
17	10				7		N			70		545	13	Br 3-150
18	30				15		N			70		546	13	Br-3-215
19	100				10		100			70		547	13	Br-3-261
20	15				10		100			70		548	13	Br-6-32
21	50				10		100			70		549	13	Br-6-55
22	50				10		300			70		550	13	Br-6-70
23	200			↓	7	↓	300			70		551	13	Br-6-134
24	70			N	30	N	300			70		552	13	Br-6-179

FILM NO. 3-144-9

REPORT NO. 60046

NOTE: Some combinations of [illegible]
Approximate values are given. In unusually favorable materials, concentrations somewhat lower than the values given may be detected. In unfavorable materials the given limits of determination may not be attained for some of the elements.

	(50) W		(10) Y		(200) Zn		(10) Zr	Si%	Al%	Na%	K%	P%	Ce	DMW	Tag No.	14	Field No.
	1	2-7	8	9-14	15	16-21	22 23-28	29 30-35	36 37-42	43 44-49	50 51-56	57 58-63	64 65-70	71	72-77 78	79-80	//////////
1	N		N		N		150								////////	14	G-1
2				10			500								KAD 530	14	Br 1-105
3				10			300								531	14	Br 1-119
4				10			150								532	14	Br 1-143
5			N				200								533	14	Br 1-155
6				10			300								534	14	Br 1-159
7				10			200								535	14	Br 1-179
8				10			300								536	14	Br 1-191
9				10			300								537	14	Br 1-204
10			N				200								538	14	Br 1-254
11			N				200								539	14	Br 3-45
12			N				300								540	14	Br 3-61
13				10			200								541	14	Br 3-80
14				10			200								542	14	Br 3-96
15				10			300								543	14	Br 3-116
16				10			200								544	14	Br 3-135
17				10			300								545	14	Br 3-151
18				20			200								546	14	Br 3-215
19				20			150								547	14	Br 3-24
20				10			300								548	14	Br 6-3
21				10			300								549	14	Br 6-5
22			N				200								550	14	Br 6-7
23	↓		N		↓		300								551	14	Br 6-134
24	N			10	N		300								552	14	Br 6-12

FILM NO. 3-145-4

REPORT NO. 00046

SEMI-QUANTITATIVE SPECTROGRAPHIC - FIELD SERVICES SECTION
ANALYSIS
6 - Step D.C. Arc

Requested by Henry Bell

Date 11/6/72

Sheet #1

	(.05) Fe %		(.02) Mg %		(.05) Ca %		(.002) Ti %		(10) Mn		(.5) Ag		(200) As		(10) Au		(10) B		(20) Ba		DMW	Tag No.		11	Field No.
	1	2-7	8	9-14	15	16-21	22	23-28	29	30-35	36	37-42	43	44-49	50	51-56	57	58-63	64	65-70	71	72-77	78	79-80	
1		1		.5		1		.2		300	N		N		N		L			1000		///////		11	G-1
2		5	L		L			.3		10										100		KAD 553		11	Br 6-187
3		2						.5	L											300		554		11	Br 6-206
4		1						.3	N											200		555		11	Br 7-32
5		1						.2		10										300		556		11	Br 7-48
6		2						.2		50										300		557		11	Br 7-87
7		2						.3	L		↓									100		558		11	Br 7-106
8		2						.3	L		N									20		559		11	Br 7-120
9	G	20						.7	L			10								300		560		11	Br 7-148
10		5						.5		15		.5								70		561		11	Br 7-172
11		2						.3		10	N									500		562		11	Br 8-44
12		.1						.1		10										500		563		11	Br 8-106
13		2						.3		15										300		564		11	Br 8-167
14		.5			↓			.3		15										300		565		11	Br 8-202
15		10			L			.2	L											700		566		11	Br 9-23
16		10			N		G	1	L											70		567		11	Br 9-80
17		5			L			.2	L											50		568		11	Br 9-85
18		10			L			.3		10										70		569		11	Br 9-127
19		5			L			.2	L											100		570		11	Br 9-156
20		15			L			.3		10										70		571		11	Br 9-193
21		10	↓		L			.3	L		↓		↓		↓		↓			70		572		11	Br 9-227
22		5	L		L			.2		20	N		N		N		L			70		573		11	Br 9-254
23																								11	
24																								11	

REMARKS: Fe, Mg, Ca, and Ti reported in %, all other elements reported in ppm. Results are in the series 1, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. Lower limits of determination are in parenthesis.

FILM NO. 3-715-9

REPORT NO. 60046

ANALYST G. W. Day

Sheet #2

	(1) Be		(10) Bi		(20) Cd		(5) Co		(10) Cr		(5) Cu		(20) La		(5) Mo		(20) Nb		(5) Ni		DMW	Tag no.		12	Field No.
	1	2-7	8	9-14	15	16-21	22	23-28	29	30-35	36	37-42	43	44-49	50	51-56	57	58-63	64	65-70	71	72-77	78	79-80	//////////
1		3	N		N		N			30		20		100	L		L			5		///////		12	G-1
2	N							15	L			20		50		20	N			7		RAD 553		12	Br 6-187
3								15		10		10		20		30				10		554		12	Br 6-200
4							N		N			20		70		70			L			555		12	Br 7-32
5							N		L			50		70		300			L			556		12	Br 7-48
6							N		N			10		20		30			L			557		12	Br 7-87
7			N					5	N			100		20		30				5		558		12	Br 7-106
8				70			N		N			30	N			70			L			559		12	Br 7-120
9				500				5		10		200		200		70			L			560		12	Br 7-148
10				20			N		N			20		70		70			L			561		12	Br 7-172
11			N					5		10		20		70		70			L			562		12	Br 8-44
12							N			10		7	N			50			L			563		12	Br 8-106
13								5		10		7		20		30			L			564		12	Br 8-167
14							N			10		10		50		100			L			565		12	Br 8-202
15								5	N			20	N			30	N		L			566		12	Br 9-63
16								10		15		150	N			700		30		5		567		12	Br 9-80
17			N				N		N			50	N			20	N		L			568		12	Br 9-85
18				30				10	N			70		20		50	N			5		569		12	Br 9-127
19			N					10	N			30	N			5	N		L			570		12	Br 9-156
20			N					15	N			70		20		70	N		L			571		12	Br 9-193
21	N		N					10	L			100		20		30	N		L			572		12	Br 9-227
22	L		N		N			10	N			70		30		30	N		L			573		12	Br 9-254
23																								12	
24																								12	

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FILM NO. 3645-9

REPORT NO. 60046

G= Greater than 10%, or Greater than value shown.
H = Interference
- = Not look for.

N = Not detected at limit of detection, or at value shown.
L = Detected, but below limit of determination, or below value shown.
* = Usual limits of determinations do not apply due to use of dilution technique.

	(10) Pb	Pd	Pt	(100) Sb	(5) Sc	(10) Sn	(100) Sr	Te	U	(10) V	DMW	Tag No.	13	Field No.
	1 2-7	8 9-14	15 16-21	22 23-28	29 30-35	36 37-42	43 44-49	50 51-56	57 58-63	64 65-70	71	72-77 78	79-80	
1	70			N	5	N	300			20		////////	13	G-1
2	50				10	10	100			50		KAD 553	13	Br 6-187
3	30				10	15	100			70		554	13	Br 6 -200
4	300				7	20	700			50		555	13	Br 7-32
5	300				5	20	700			20		556	13	Br 7 -48
6	150				5	15	300			15		557	13	Br 7 -87
7	70				7	15	300			15		558	13	Br 7 -106
8	10				7	10	N			15		559	13	Br 7 -120
9	500				15	150	1000			30		560	13	Br 7 -148
10	70				10	30	500			15		561	13	Br 7 -172
11	50				10	N	300			70		562	13	Br 8 - 44
12	15				N	N	100			30		563	13	Br 8 -106
13	15				7	N	100			50		564	13	Br 8 -167
14	30				10	N	700			50		565	13	Br 8 -202
15	70				7	N	500			70		566	13	Br 9 -63
16	30				30	70	N			150		567	13	Br 9 -80
17	10				7	N	N			10		568	13	Br 9 -85
18	30				7	10	100			70		569	13	Br 9 -127
19	15				5	N	N			70		570	13	Br 9 -156
20	15				7	15	N			70		571	13	Br 9 -193
21	30				5	20	N			70		572	13	Br 9 -227
22	30			N	5	15	100			50		573	13	Br 9 -254
23													13	
24													13	

REPORT NO. 6046

concentrations somewhat lower than the values given may be detected. In unfavorable materials the given limits of determination may not be attained for some of the elements.

Sheet #4

(50) W		(10) Y		(200) Zn		(10) Zr	Si%	Al%	Na%	K%	P%	Ce	DRW	Tag No.	14	Field No.
1	2-7	8	9-14	15	16-21	22 23-28	29 30-35	36 37-42	43 44-49	50 51-56	57 58-63	64 65-70	71	72-77 78	79-80	//////////
W			10	N		200								///////	14	G-1
			10			200								KAD 553	14	Br 6-187
		N				200								554	14	Br 6 -202
		N				150								555	14	Br 7-32
		N				150								556	14	Br 7 -48
		N				150								557	14	Br 7 -87
		N				200								558	14	Br 7 -106
		N				150								559	14	Br 7 -120
			15			500								560	14	Br 7 -148
			10			300								561	14	Br 7 -172
			10			200								562	14	Br 8 - 44
		N				100								563	14	Br 8 -106
			10			200								564	14	Br 8 -167
↓			10			200								565	14	Br 8 -202
W			10			150								566	14	Br 9 - 63
	70		30			1000								567	14	Br 9 - 80
N			10			150								568	14	Br 9 - 85
		N				200								569	14	Br 9 -127
		N				150								570	14	Br 9 -156
			10			200								571	14	Br 9 -193
↓			10	↓		200								572	14	Br 9 -227
N			10	N		150								573	14	Br 9 -254
															14	
															14	

Table 2:-- Gold analyses of drill core, Brewer mine,
Chesterfield Co., South Carolina

FIELD SERVICES SECTION

Submitter: H. Bell HM 60046

ELEMENT AND METHOD ANALYST ELEMENT AND METHOD ANALYST

1/2-4 A.-C.A. Curtis

Completion Date 9-24-73

FIELD NO.	TAG NO.	DATE:							
		Au	AuSW						
KAD 530		1.0							
531		0 40							
532		2.5							
533		3.0		Br-1					
534		3.5							
535		1.5							
536		2.0							
537		1.0							
538		3.5							
539		L(0.05)							
540		L(0.05)							
541		L(0.05)		Br-3					
542		N(0.05)							
543		↓							
544		↓							
545		N(0.05)							
546		L(0.05)							
547		L(0.05)			6				
548		L(0.05)		Br-					
RKF		0.05							

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REMARKS: G = Greater than value shown; H = Interference; - = Not looked for; N( ) = Not detected at limit of detection, or at value shown; L( ) = Detected, but below limit of determination, or below value shown; * = Usual limits of determinations do not apply due to use of dilution technique or different sample weight; INS = Indicates insufficient sample. All values reported in parts per million unless otherwise noted.

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FIELD SERVICES SECTION

Submitter: H. Bell HM 60046 2/3

ELEMENT AND METHOD ANALYST ELEMENT AND METHOD ANALYST

Completion Date

FIELD NO.	TAG NO.	DATE: Au	AuSW						
KAD 549		N(0.05)		Br-6					
550		↓							
551									
552									
553		N(0.05)							
554		L(0.05)							
555		0 30		Br-7					
556		0 05							
557		0.10							
558		0.05							
559		0.80							
560		1.5							
561		0.80							
562		L(0.05)		Br-8					
563		N(0.05)							
564		N(0.05)							
565		N(0.05)		Br-9					
566		0.15							
567		0.20							
RRF		0.10							

REMARKS: G = Greater than value shown; H = Interference; - = Not looked for; N( ) = Not detected at limit of detection, or at value shown; L( ) = Detected, but below limit of determination, or below value shown; * = Usual limits of determinations do not apply due to use of dilution technique or different sample weight; INS = Indicates insufficient sample. All values reported in parts per million unless otherwise noted.

FIELD SERVICES SECTION

Submitter: H. Bell HM 60046 3/3

ELEMENT AND METHOD ANALYST ELEMENT AND METHOD ANALYST

Completion Date

FIELD NO.	TAG NO.	DATE: / Au	/ AuSW						
KAD 568		0.25							
569		0.55							
570		0.15							
571		0.20							
572		0.10							
573		0.10							
REF									

Br-9

REMARKS: G = Greater than value shown; H = Interference; - = Not looked for; N( ) = Not detected at limit of detection, or at value shown; L( ) = Detected, but below limit of determination, or below value shown; * = Usual limits of determinations do not apply due to use of dilution technique or different sample weight; INS = Indicates insufficient sample. All values reported in parts per million unless otherwise noted.