the Mineralogical Record

Volume Twenty-six, Number Six
November–December 1995
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THE MINERALOGICAL RECORD

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Articles

Columns

COVER: BENITOITE and NEPTUNITE from the Benitoite Gem mine, San Benito County, California. Buzz Gray collection; photo by Harold and Erica Van Pelt.

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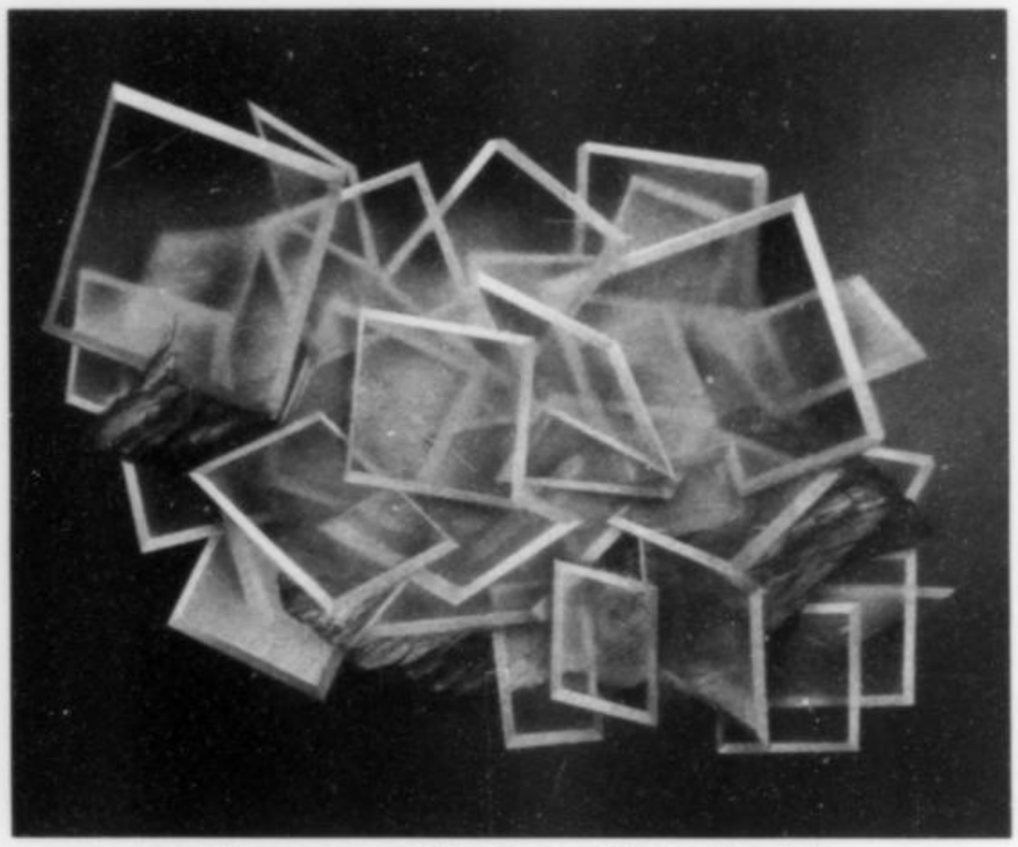
notes from the EDITOR

WE WERE ROBBED!

The recent Springfield Show was among the best ever for us in terms of sales at our show table. Unfortunately, the car belonging to our East Coast coordinators, Charles and Marcelle Weber, was broken into on Saturday night of the show. All cash, checks, credit card orders and original receipts were stolen. *Without these receipt records we cannot process any of the subscription or mail orders.* Please contact the Circulation Manager if you placed any order at the Springfield Show that has not yet been fulfilled. If you wrote a check or credit card order for anything, your accounts cannot be billed unless you send a new check and duplicate credit card information. Please help us fulfill your order and minimize our loss on this incident by confirming all orders and payments.



Rowley mine wulfenite by Pierre Rondelez.

MORE MINERAL ART

Good mineral art, as we've observed before, is hard to come by. The collector interested in decorating his wall with a fine rendering of a beautiful specimen cannot generally pop down to the nearest commercial art gallery and peruse examples. The potential buyer must seek out the artists on his own, and they can be hard to find because there doesn't seem to be an appropriate forum where they can regularly display their work to the broader mineralogical public.

The *Mineralogical Record* has tried to provide some exposure for artists, a recent example being the superb book of paintings by German artist Eberhard Equit (vol. 26, p. 231). Another of the best is Hilde Könighofer in Retteneg, Austria (see vol. 23, p. 84). And closer to home there is Carl Bentley (see vol. 19, p. 290).

I have recently become aware of yet another accomplished mineral artist, Pierre Rondelez (Zegelaan 24, B-8450 Bredene, Belgium). Rondelez has been a mineral collector since the 1970's, and also has a classical background in fine art. He was inspired to try his hand at mineral illustration by a class in airbrush painting. Some years of experimentation followed during which he tinkered with masking techniques, and developed a very interesting and effective approach. Two exhibitions of his work last spring in Belgium were well-received by the public. An example is shown here. If you are seriously interested in adding a Rondelez to your collection, drop him a line and he will be happy to send you snapshots of pieces that are currently available.

NEW MINERAL MAGAZINE!

The Australian State Mineralogical Societies of Queensland, New South Wales, South Australia, Tasmania and Victoria have joined forces to publish a new Australian mineral magazine: the *Australian Journal of Mineralogy*. The journal will take up where the old *Australian Mineralogist* (which was sponsored only by one society) left off, but stands on a much sounder financial and administrative footing.

The editor (Dermot Henry) and the associate editors (Dr. Bill Birch, Ralph Bottrill, Prof. Laurie Lawrence, Dehne McLaughlin, Dr. Ernest Nickel, Dr. Alan Pring, Eric Stevens and Prof. Peter Williams) are all committed to producing a high-quality journal devoted to Australian mineral localities, mineral people and mineral news. The goal is to appeal to mineral collectors and professional mineralogists alike.

The first issue, in $8^1/_4$ x 12-inch format, contains articles on the Magnet mine (Tasmania), the Mt. Isa district (Queensland), an obituary of Blair Gartrell, notes on references to Australian minerals in other journals, notes on recent mineral finds in England, letters, a book review, society news, ads, and a report on the 1995 Tucson Show. The issue contains four interior pages of excellent color photography (36 pages total).

Australian Journal of Mineralogy will be published twice yearly at a subscription cost of A$23 (to Australia) and A$26 (to everywhere else), seamail. Write to AJM Treasurer John Bosworth, c/o Department of Mineralogy, Museum of Victoria, P.O. Box 666E, Melbourne, Victoria 3001, Australia.

Photo by Harold and Erica Van Pelt

Time is running out!

December 31st is the nomination deadline for the 1995 Carnegie Mineralogical Award.

The Carnegie Mineralogical Award honors outstanding contributions in mineralogical preservation, conservation and education that match ideals advanced in The Carnegie Museum of Natural History's Hillman Hall of Minerals & Gems. Private mineral enthusiasts and collectors, educators, curators, mineral clubs and societies, museums, universities and publications may be nominated. The distinguished recipient accepts a bronze medallion, a certificate of recognition and a $2500 cash prize at an awards ceremony held during the Tucson Gem and Mineral Show in February.

Nominations must be received by December 31 to be considered for the 1995 award.
For a nomination form, contact:

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Section of Minerals
The Carnegie Museum of Natural History
4400 Forbes Avenue
Pittsburgh, PA 15213-4080
TEL: (412) 622-3391 FAX: (412) 622-8837

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A Guide to Mineral Localities *in the* Former Soviet Union

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Broomfield, CO 80020-1157

Since the fall of communism, mineral localities in the various nations of the former Soviet Union have been yielding a flood of fine material onto the international specimen market. With this mineralogical bounty has come the headache of dealing with the transliteration and interpretation of Russian-language locality names and their variants and complexities on specimen labels. We present here a table of data designed to alleviate some of those difficulties, and to make the documentation of ex-Soviet specimens more user-friendly to the (American) mineral collector, curator and dealer.

INTRODUCTION

A number of collectors, curators and dealers have expressed dissatisfaction with the generally available locality information for the successor states to the Soviet Union. Marc Wilson (Carnegie Museum) and Stanley Dyl (Seaman Museum) have previously prepared their "Unofficial, First-Pass, Layman's Guide to Americanized Nomenclature for Mineral Localities in the Various States of the Former Soviet Union." The following list was compiled in an attempt to advance our understanding of these localities.

What is attempted here is to provide a generally acceptable American transliteration of Soviet mineral locality names, and the names of the broader geographical and political entities in which they are embedded. A secondary effort was made to provide the Cyrillic version of these names, for the use of those traveling to this area and those who work with Russian printed matter (such as the *Atlas Mira*).

First we must give several caveats:

(1) This list is **not** intended to be, now or in any later

version, a gazetteer of "all" ex-Soviet Union mineral localities.

(2) There are, without doubt, spelling, grammatical, and syntactical errors, not to mention the errors of substance: misidentified localities. We have been especially remiss in our cavalier treatment of noun declensions and adjectival endings; the endings *skaya, skiy,* and *skogo* have received some rough handling.

(3) This list is only partially useful to any one group of readers. Academic readers will find that some, but not all, type localities are identified; dealers will unfortunately encounter localities not on this list; collectors lacking any world atlas will still be at a disadvantage.

(4) Unless this list is updated, its value will diminish with time. It is impossible to believe that the enormous nation of Russia (the former Russian Soviet Federated Socialist Republic) which is still twice the size of the U.S. and which is a very complex patchwork of Oblast', Kray, A.S.S.R., Okrug, Rayon and whatever, will pass unchanged through the first decade of the next century. What is happening in Chechnya may be more representative of the future than we might hope. There may also be external political alterations; a good candidate is the Crimea.

(5) This chart is intended to be helpful, not mandatory. We cannot, and do not wish, to proscribe any usage. After all, when you hold a specimen in your hand, you probably want to know exactly where on planet Earth it came from, and are less interested in the nuances of the spelling of this locality. We use our recommended spelling to provide a home for the "Lat/Long," "Location Type" and the mineral list. We do not insist that our spelling is canonical, only that it is both useful and consistent.

For those who wish to know more about what, exactly, they are buying into if they use our proposal, further explanatory notes are given on the following page.

COLUMN HEADINGS

English: this column contains the English version, printed in **bold**, that we recommend for this locality. This column also contains other versions that we do **not** recommend; these are usually followed by "—see (recommended version)." The only variants listed are those that we have actually encountered; most were found on specimen labels. "NGS" signifies the spelling used on the National Geographic Society Map of Russia, etc., Revised April 1994.

Cyrillic: the Cyrillic version is provided **only** if we have actually encountered it, in *Atlas Mira* (*Атлас Мира*) or the Russian language version of *World of Stones* (*Мир Камня*), or it has been provided by Michael Leybov or Dmitriy Belakovskiy. Variants on the adjectival endings are not only possible, but likely.

Lat/Long: Latitude on top. Coordinates are provided only for features of modest real extent; thus lakes, seas, peninsulas, etc., are excluded. The coordinates are from the (London) *Times Atlas, Ore Deposits of the USSR* (Smirnov, 1977), or the *Gazetteer of the United States Board on Geographic Names*; they are exact (to the minute of arc). Several localities have *west* longitude. For these, a "W" appears below.

Location Type: What is this place?

Higher Order Location: Generally, the next higher order political entity appears in the top of the box; more specific physical geographic information sometimes appears below. No attempt has been made to make the physical geography comprehensive.

Mineral Species: No inferential species are included, only those actually reported (but perhaps incorrectly). An attempt has been made to include only the species deemed "important" for the locality: fine specimens (e.g. Puyva axinite), characteristic associated minerals (Puyva chlorite), species for which this is the type locality (indicated by the asterisk). By no means are all type locality species included; there are dozens of type locality species in the Kola Peninsula alone. It is possible that *two* localities are listed as type; this may occur when one locality is a subset of a larger locality, as Rasvumchorr is to Khibiny, or Talnakh to Noril'sk.

If you have a putative locality, see if you can find your variant in the chart. If your variant does not agree with our recommendation, the chart should direct you to the preferred version. It should also provide you with the next higher political entity. Thus a scheelite from Tulytin → Iul'tin → Chukotskiy National Okrug (or Chukotsk Peninsula) → (Russia). When the expression "see—" occurs in the block labeled "English," it points from a variant expression to the expression consistent with our transliteration.

TWO RECOMMENDATIONS

(1) *Do your own transliterations.* The further down the road the original Cyrillic is carried, the less the opportunity for garbling. Your Russian suppliers may be masters of their language, but you, not they, are the master of American

Transliteration Table

Аа	A	Ии	I	Рр	R	Шш	Sh
Бб	B	Йй	Y	Сс	S	Щщ	Shch
Вв	V	Кк	K	Тт	T	Ыы	Y
Гг	G	Лл	L	Уу	U	Ьь	'
Дд	D	Мм	M	Фф	F	Ээ	E
Ее	E	Нн	N	Хх	Kh	Юю	Yu
Жж	Zh	Оо	O	Цц	Ts	Яя	Ya
Зз	Z	Пп	P	Чч	Ch		

English. This counsel is even wiser if there are other nationalities in the supply chain.

(2) Anyone in possession of earlier versions of this gazetteer should replace it with this version. Not only does this edition provide more localities, it also corrects numerous errors, of which several were quite serious.

EXPLANATORY NOTES

Which Transliteration?

The principal question to be answered in the compilation of the above table was: what transliteration should be used? Those who doubt the diversity of transliteration schemes may consider that the name of the great composer Tchaikovsky (French) or Tschaikowsky (German) is spelled in Russian (Cyrillic) exactly as that of the revolutionary Chaykovsky (or Chaikovskii). (Other spellings for the composer have been Csajkevszkij, Cajkovskij, Caikovskis, Tchaikowsky, Ciaikovsky, and at least six others, not to mention the variants on his Christian name and patronymic.) This question is in fact two: how do we transliterate Russian names; what do we do with non-Russian names, e.g. names of Kazakh origin?

Russian Names

To answer the first question, we searched for American (not necessarily English) transliterations of the Russian alphabet that had received substantial acceptance. Two publications came to hand: the journal *Post Soviet Geography* (the successor publication to guess what? *Soviet Geography*), and J. T. Shaw's *The Transliteration of Modern Russian for English-Language Publications* (U. of Wisconsin Press, 1967). Shaw's Transliteration Chart I is the one he recommends for usages such as ours. Fortunately for all of us, these two charts provide *identical* transliterations (except the Cyrillic "soft sign": ь). We then compared this transliteration with that used in the relatively new National Geographic Society map of the Commonwealth of Independent States, the great five-volume *London Times Atlas* of the early 1960's, and the usage in the Defense Mapping Agency (DMA) International Aeronautical Charts. For the truly Russian names, these three publications were in agreement both with each other and with the transliteration supported by Shaw and *PSG*. This transliteration, we have since discovered, is also in exact agreement with the transliteration stipulated by the *United States Board on Geographic Names* (1970).

This transliteration is the one used here, and is provided on the preceding page. The equivalence is almost one-to-one: each Cyrillic character goes to a unique Latin character (or a symbol), except that both Й and Ы are mapped to the Latin "Y," and both Е and Э are mapped to "E." But care should be taken in going from Latin characters back to Cyrillic: TS should usually, but not always, go to Ц not ТС.

There is one major exception to the transliterations as given: *initial* Cyrillic Е or Э is always mapped to Latin Ye ("yeh"). For example the mineralogically important city Екатеринбург becomes Yekaterinburg. This is *never* done when Е or Э are internal or final.

Some mineralogically popular spellings are here replaced by "new" spellings; the spellings used here agree with our transliteration system, and are the ones used by our authorities, and by most modern maps. We do not plan to replace Moscow with Moskva, or Caucasus with Kavkas, and we accept Crimea versus Krym, but we will support Murzinka instead of Mursinsk. Objections have been raised to some of our recommendations (Baykal, Altay); our response must be that it is always the reader's choice. We again disclaim any intent to enforce our preferences on the mineralogical community.

Non-Russian Names

Next came the hard part: what to do with the *non-Russian* names from the former U.S.S.R.? It is certainly politically correct to use direct English transliterations from the native tongue, but unfortunately there are ten non-Russian successor states, and we have no transliteration chart for any of them. Even if we did, we often have no idea of how the native speakers express a given locality in their native language. The five Central Asian states officially do not use the Latin nor the Cyrillic alphabet. Four of them use Turkic languages; when written they are expressed in variants of the Arabic alphabet. The fifth (Tadzhik) is an Indo-European

SOME USEFUL TERMS

A.O.		Autonomous Oblast'
-chorr	-чорр	mountain (this is not a Russian word; it is presumably Lappish, a Finno-Ugraic language
gora	гора	mountain
gorod, grad	город, град	town, city
guba	губа	gulf
khrebet	хребет	range (of mountains)
kop'	копь	"pit" or mine
Mestorozhdenie	Месторождение	(mineral) deposit
more	море	sea
nizhn-iy-yaya	нижний	lower
oblast'	область	province
Oblys		Kazakh version of Oblast'
okrug	округ	district
ozero	озеро	lake
poluostrov	полуостров	peninsula
rayon	район	area
reka	река	river
rudnik	рудник	mine
S.S.R.		Soviet Socialist Republic (constituent state of the U.S.S.R.)
Severn-aya	Северная	Northern
sopka	сопка	volcano
verkhn-iy, yaya	верхний	upper
Vostochn-aya	Восточная	Eastern
Welayat		Turkmen for Oblast' (equivalent to Turkish 'vilayet')
Yuzhn-aya	Южная	Southern
Zapadn-aya	Западная	Western

language related to Farsi (Persian); it is written in the Farsi alphabet, which is itself a variant of the Arabic alphabet. All of the mineral localities of the successor states have Russian Cyrillic expression; they appear in the scientific literature and on maps using their Cyrillic names; the Russian forms are used by mine managers, geologists, and the others who exploit these deposits; even the mine names are Russian.

We therefore settled on what we feel is a practical policy: recommend the use of the National Geographic Society (NGS) forms for the names of the newly independent republics; use the Cyrillic form as the names for all internal entities, but provide the native alternative if available. Thus the mineralogically important Kazakh Oblast' of Kustanay also refers to Qostanay.

Cyrillic Names

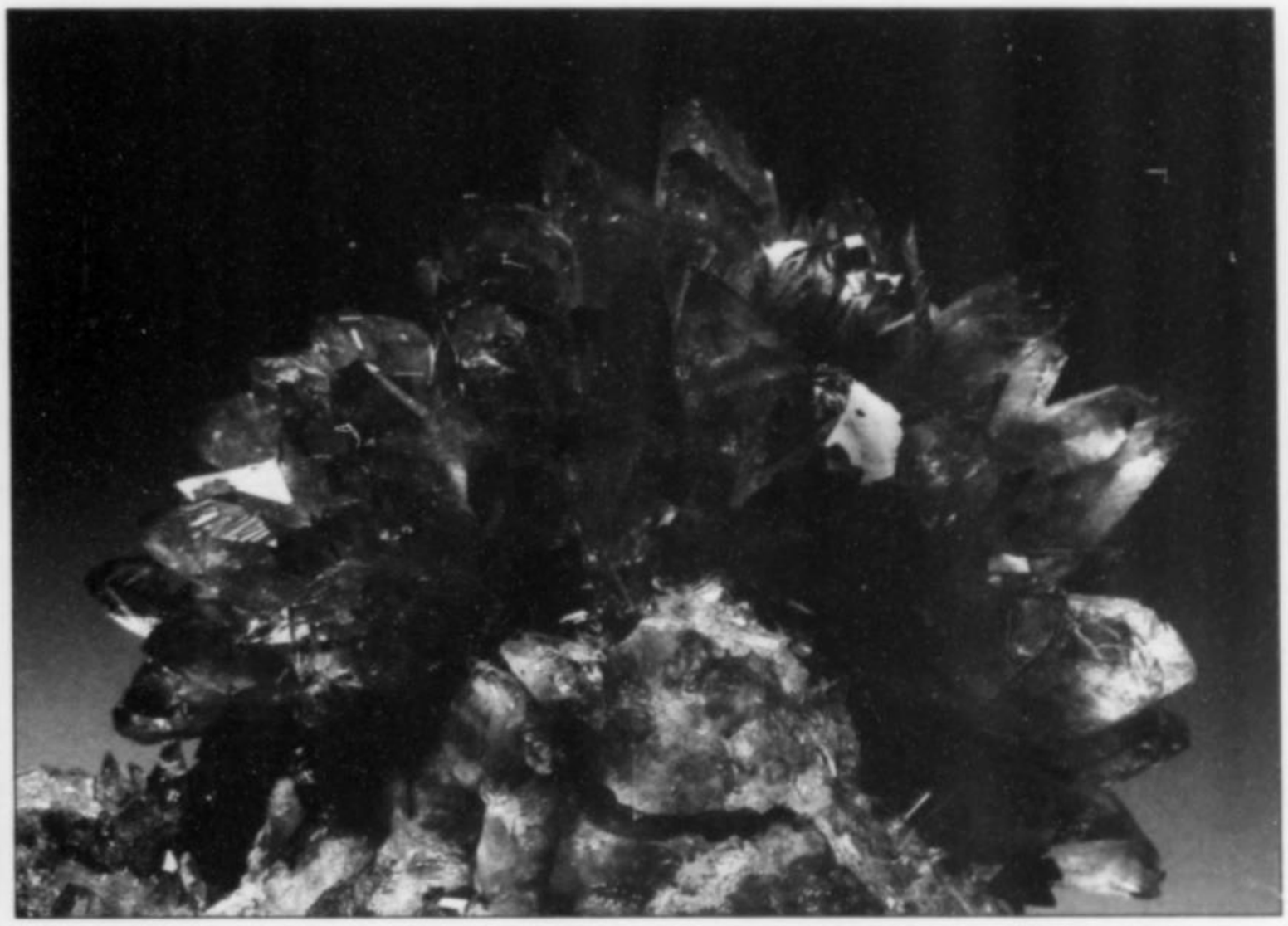
The original planning for this project did not include providing Cyrillic locations, but we found it necessary to write out the Cyrillic expressions in order to make accurate transliterations (and, initially, to compare transliterations). We found it easier to collect all the disparate names under their (hopefully unique) Cyrillic names; we did this even before we had decided on the appropriate transliteration. Fortunately, WordPerfect for Windows, version 6.0a provides excellent foreign language alphabets and tools for alphabetizing and indexing non-Latin text. Since the Russian names were available (most of the time) we provide them.

ACKNOWLEDGMENTS

Marc Wilson, Carnegie Museum of Natural History, provided both incentive and wise counsel throughout this project. Discussions with Richard Bideaux were invaluable; he also furnished much information. Dmitriy Belakovskiy, Fersman Mineralogical Museum, and Michael Leybov, *World of Stones*, gave both information and critiques that only mineralogically knowledgeable native speakers could provide. Eugene Foord and Peter Modreski, both of the U.S. Geological Survey, helped guide us, and also gave us strong encouragement. Monika Obodda and Sharon Cisneros gave significant assistance. Curtis Schuh provided Shaw's transliteration chart. Collector's Edge served as a test site for earlier versions of the gazetteer. Rene Triebl shared with us his comprehensive knowledge of ex-Soviet mineral localities. Many dealers allowed us to inspect their labels; Van Scriver-Pljaskov were an especially rich source of data.

Dioptase crystals to 2.7 cm, from the Altyn-Tyube mine, Kazakhstan.

Eudialyte crystal, 1.4 cm, from Mt. Eveslogchorr, central Khibiny Massif, 50 km east-northeast of Apatity, Murmansk Oblast', Kola Peninsula, Russia.



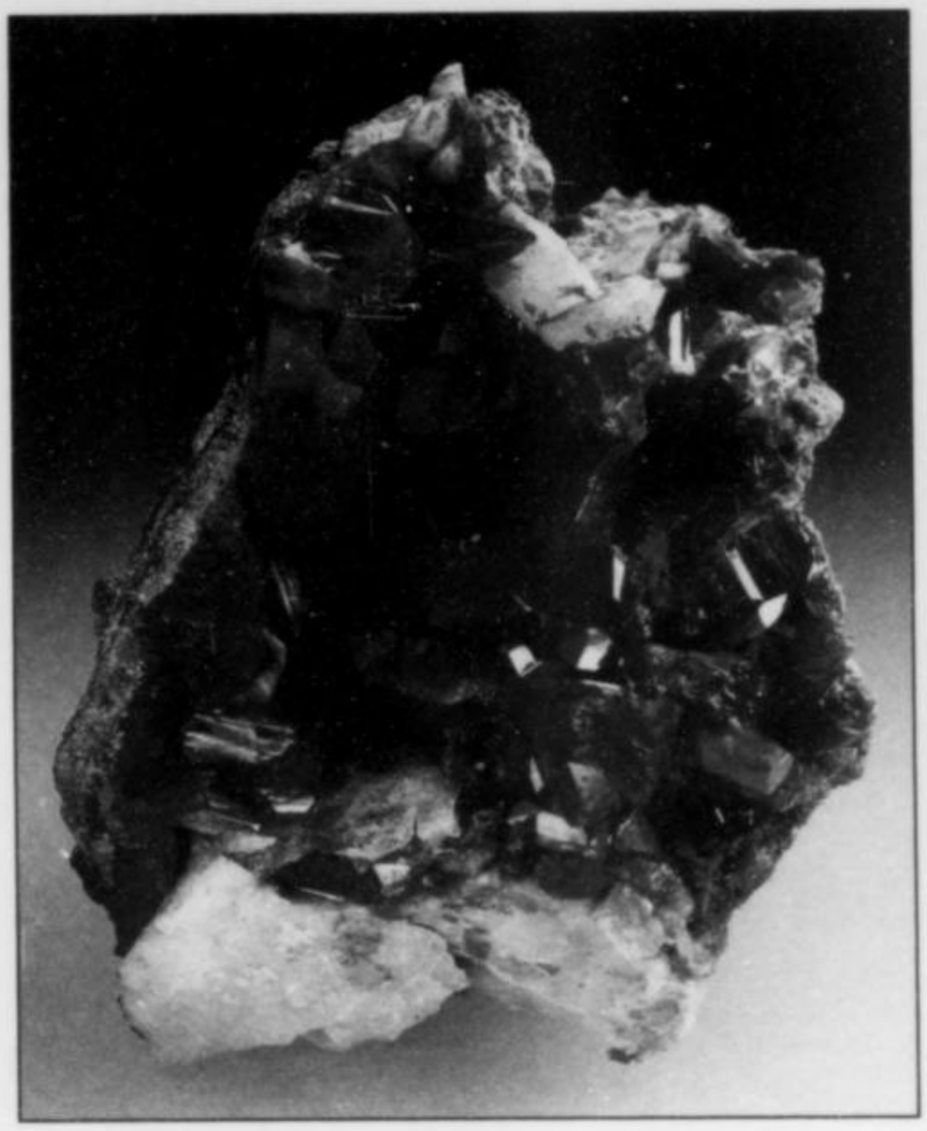
Creedite crystal group, 6 cm across, on matrix, from Akchatau, central Kazakhstan.

Vesuvianite crystals to 2 cm, from Asbest, Ural Mountains, Russia.

Fluorite and fluorapatite from Akchatau, Kazakhstan; 20 cm long.

English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Adon Cholon, Adun Tschilon—see Adun Chilon					
Adun Chilon	Адун Чилон		Region	Chintinskaya Oblast' Southwest of Shirlovaya G. 30 km west of Borzya	Aquamarine, topaz, smoky quartz, fluorite, elbaite (See also Soktuy and Shirlovaya Mountain)
Afrikanda	Африканда	67°27 32°48	Town massif	Murmansk Oblast' SW of Kirovsk, Kola Peninsula	*Kassite, *cafetite, perovskite, titanite, ancylite, schorl
Ajaguz—see Ayaguz					
Ajano—see Ayano					
Ajerbajpschan—see Azerbaijan					
Akchatau (see also Aqshatau)	Акчатау	47°59 73°45	Settlement, mine	Karaganda Oblast'	Apatite, aquamarine, bertrandite, bismuthinite, creedite, fluorite, pyrite, smoky quartz, topaz, wolframite, molybdenite, scheelite
Akehatau, Akschatau, Akschatan, Aktschatau—see Akchatau					
Akhmatovskaya Kop'	Ахматовская Копь		Mine	Chelyabinsk Oblast' 10 km from Zlatoust	Perovskite, clinochlore, grossular, diopside, vesuvianite, epidote
Akhtaragda	Ахтарагда	63°03 112°15	River	Joins Vilyuy river at Chernyshevskiy	(See Chernyshevskiy)
Aklaz—see Aktas					
Aktas		48°04 66°15	Town	Dzhezkazgan Oblast'	Quartz with rutile inclusions
Alabashka	Алабашка	57°43 61°08	Stream village	Yekaterinburg Oblast' 6 km N of Murzinka	Quartz, topaz (See also Mokrusha)
Alai—see Alay					
Alay, Alayskiy Range	Алайский Хребет		Mountains	Between Tadjikistan and Khirgistan; north of Pamirs	(See Dari-i-Pioz, Khaydarkan)
Aldan	Алдан	58°44 125°22	Town, river, hills, mining district, shield	Yakutsk A.S.S.R. (now Sakha) eastern Siberia	Spinel, scapolite, phlogopite, serpentine ps. after forsterite (See also Inagli, Murun, Yemel'dzak)
Alluaiv—see Alluiyv					
Alluiyv	Аллуайв	67°54 34°32	Mountain	Murmansk Oblast' NW bumps of Lovozero Massif	*Alluavite, belovite, elpidite, *grumantite, *keldyshite, *sobolevite, sidorenkite, *terskite, ussingite, vuonnemite, villiaumite, steenstrupine, *natrophite
Altai—see Altay					
Altay	Алтай		Mountains	Junction of Siberia, Kazakhstan, and Mongolia	*Altaite
Altyn-Tube, Altyn-Tjube, Altyne-Tyube—see Altyn-Tyube					
Altyn-Tyube	Алтын-Тюбе	41°22 69°06	Deposit	South Kazakhstan Oblast', near Tashkent	Dioptase, calcite

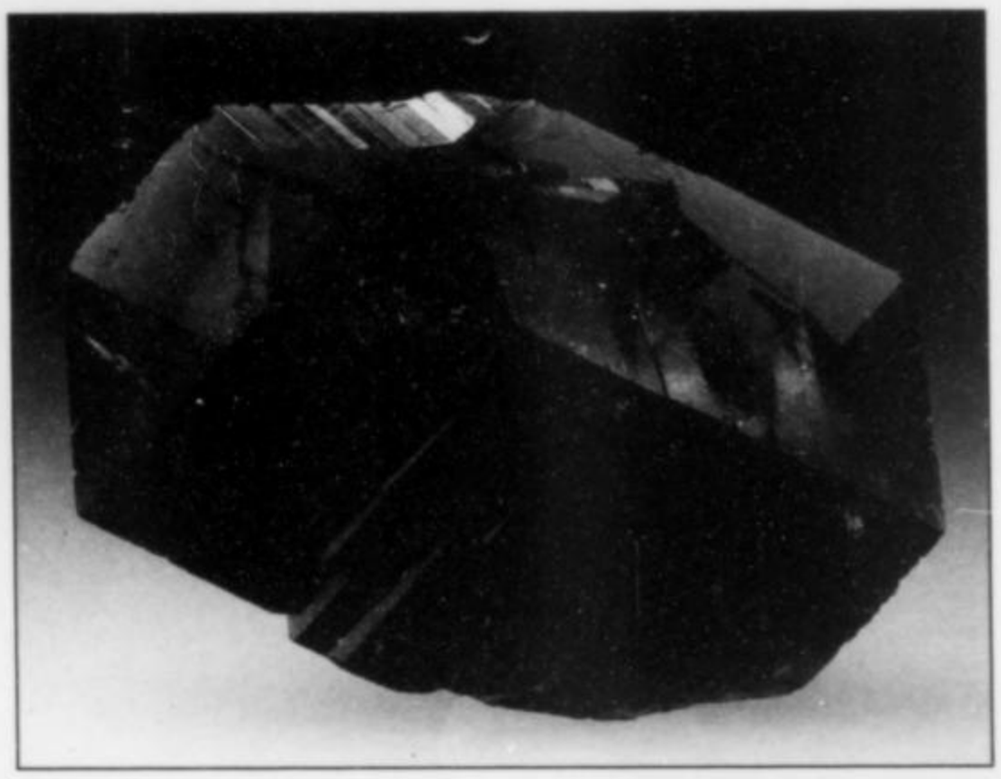
English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Amur	Амур		River	Boundary river with Manchuria (China); to sea of Okhotsk	
Anadyrskiy—same as Chukotskiy Range	Анадырский		Mountains	Chukotsk Nats. Okrug	
Anakit	Анакит		Creek	Into Lower (Nizhnyaya) Tunguska River	Afwillite, merwinite, rankinite, spurrite, tilleyite
Andree-Yul'evskiy Mine			Mine	See Kamenka River	Topaz
Angara	Ангара		River	From Lake Baykal, past Irkutsk, to Yenesey	
Apatity	Апатиты	67°33 33°15	Town	Murmansk Oblast' western Kola Peninsula	Apatite
Aqshatau—transliteration of Turkic form of Akchatau					
Asbest	Асбест	57°05 61°30	Town	Yekaterinburg Oblast' Kola Peninsula	Brucite, clinochlore, diopside, grossular, serpentine!, vesuvianite (See also Bazhenovskoe)
Aserbaidschan, Aserbajdszan—see Azerbaijan					
Ayaguz	Аягуз	47°56 80°23	Village stream	Semipalatinsk Oblast' NE of Lake Balkhash	Wulfenite
Ayan	Аян		Bay	Khabarovskiy Kray on the sea of Okhotsk	
Ayano-Mayskiy Rayon	Аяно-Майский Район		Region	Khabarovskiy Kray See Ayan and Mayskiy	See Konder
Azerbaijan—NGS spelling—see also Azerbaydzhan			Republic (former S.S.R.)	Caspian Sea	
Azerbaydzhan—Cyrillic version of Azerbaijan	Азербайджай				
Baikal—see Baykal					
Bakhchisaray	Бахчисарай	44°44 33°53	Town	Crimea Oblast'	Apophyllite, prehnite
Balchasch—see Balkhash					
Balkhash	Балхаш	46°50 74°57	Town, lake	Karaganda Oblast'	Rhodochrosite, heulandite (See also Kounrad, Ayaguz)
Baykal	Байкал		Huge lake	South-central Siberia, source of Angara River	
Bazhenovskoe			Deposit	Asbest	Brucite
Beresowsk—see Berezovsk					
Berezovsk	Березовск	57°38 57°21	Town	Yekaterinburg Oblast'	Aikinite, *cassedanneite, chalcopyrite, *crocoite, *embryite, gold, *phoenicochroite, pyrite, *pyrophyllite, scheelite, *vauquelinite, vanadinite



Crocoite crystals on quartz matrix, 4 cm, from Berezovsk, Ural Mountains, Russia.

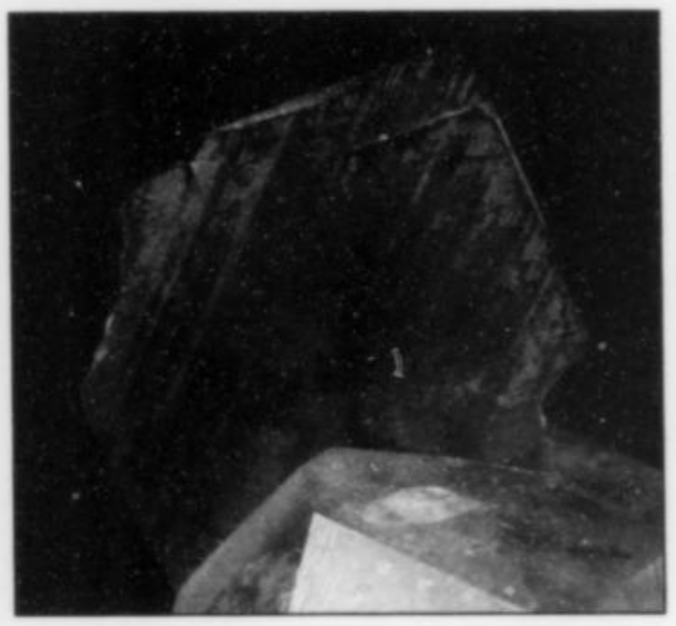
Blood-red wulfenite crystals to 1.5 mm, from Ayaguz, Kazakhstan.

Diopside and grossular crystal group, 4 cm, from Asbest, Ural Mountains, Russia.



Ferroaxinite crystal, 3.8 cm, from the Dodo mine, near Puyva in the Polar Urals, Russia.

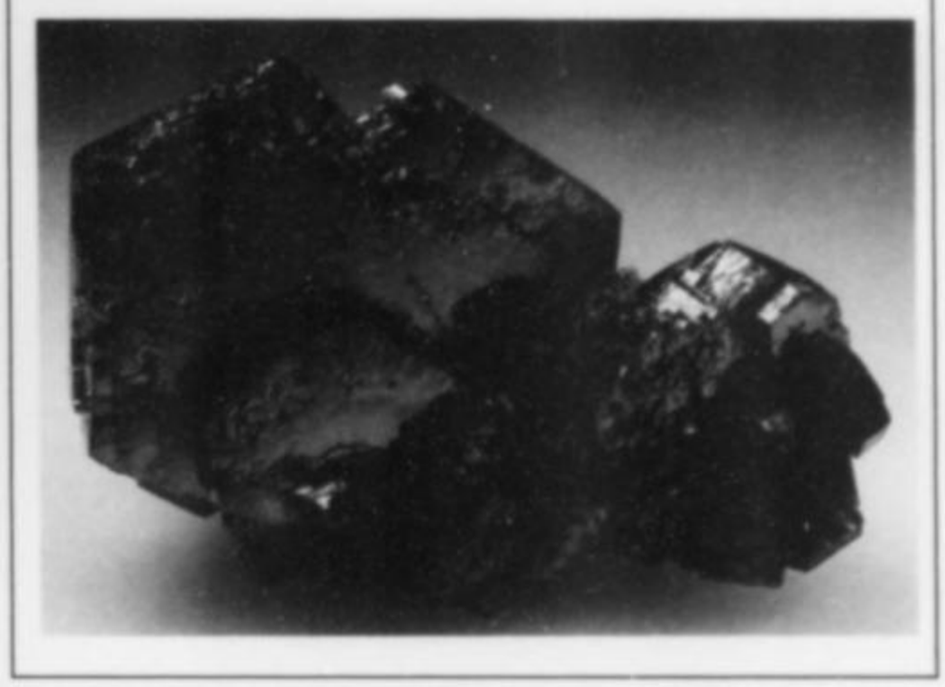
Titanite crystal cluster, 2.5 cm across, from the Dodo mine, near Puyva, Russia.



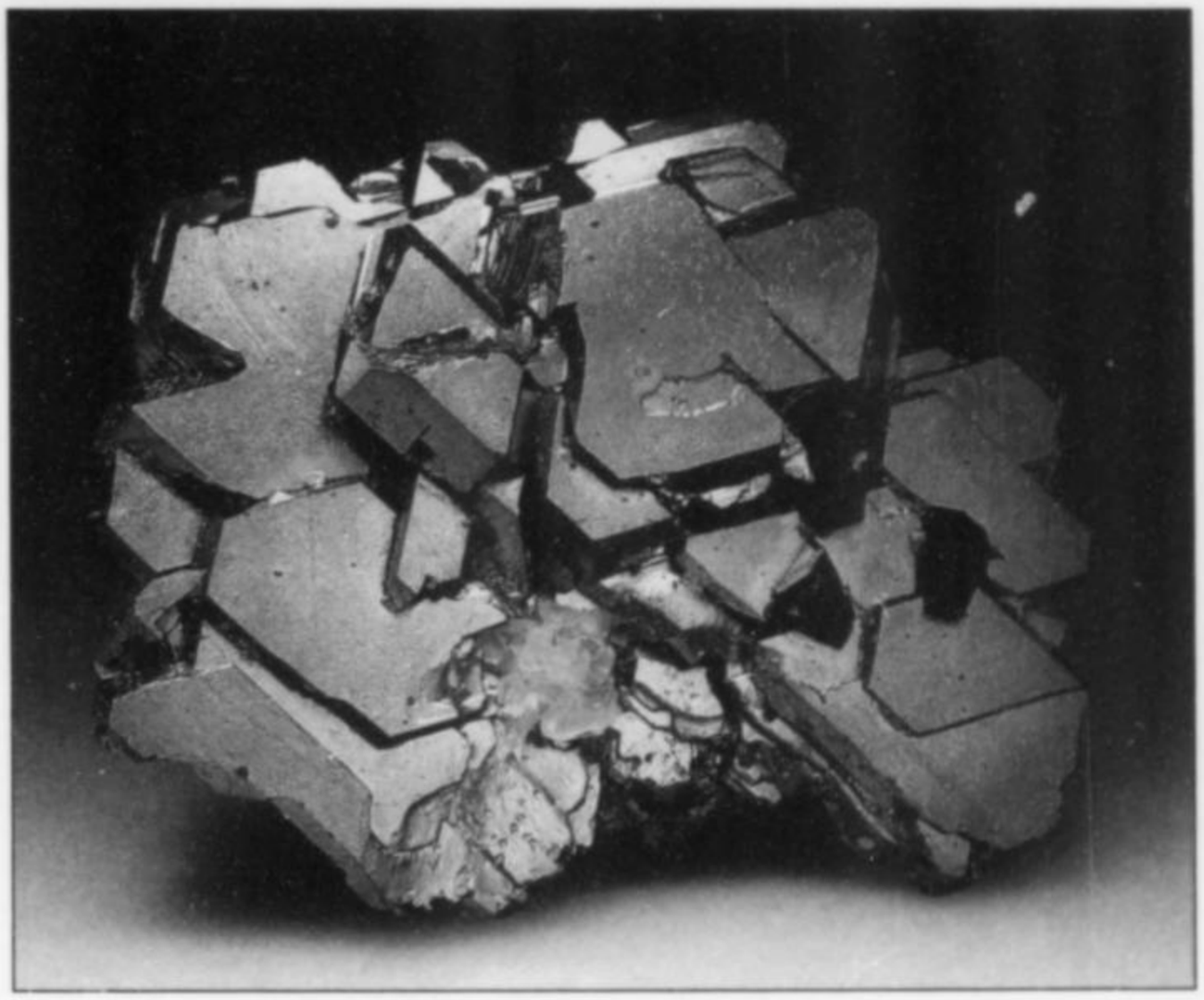
Brookite crystal, 2.5 cm, on quartz, from the Dodo mine, near Puyva, Russia.

Topaz crystal, 10 cm, from Alabashka in the Ural Mountains, Russia.

Large datolite crystal group, 15.4 cm across, from Dal'negorsk, Primorskiy Kray, Russia.



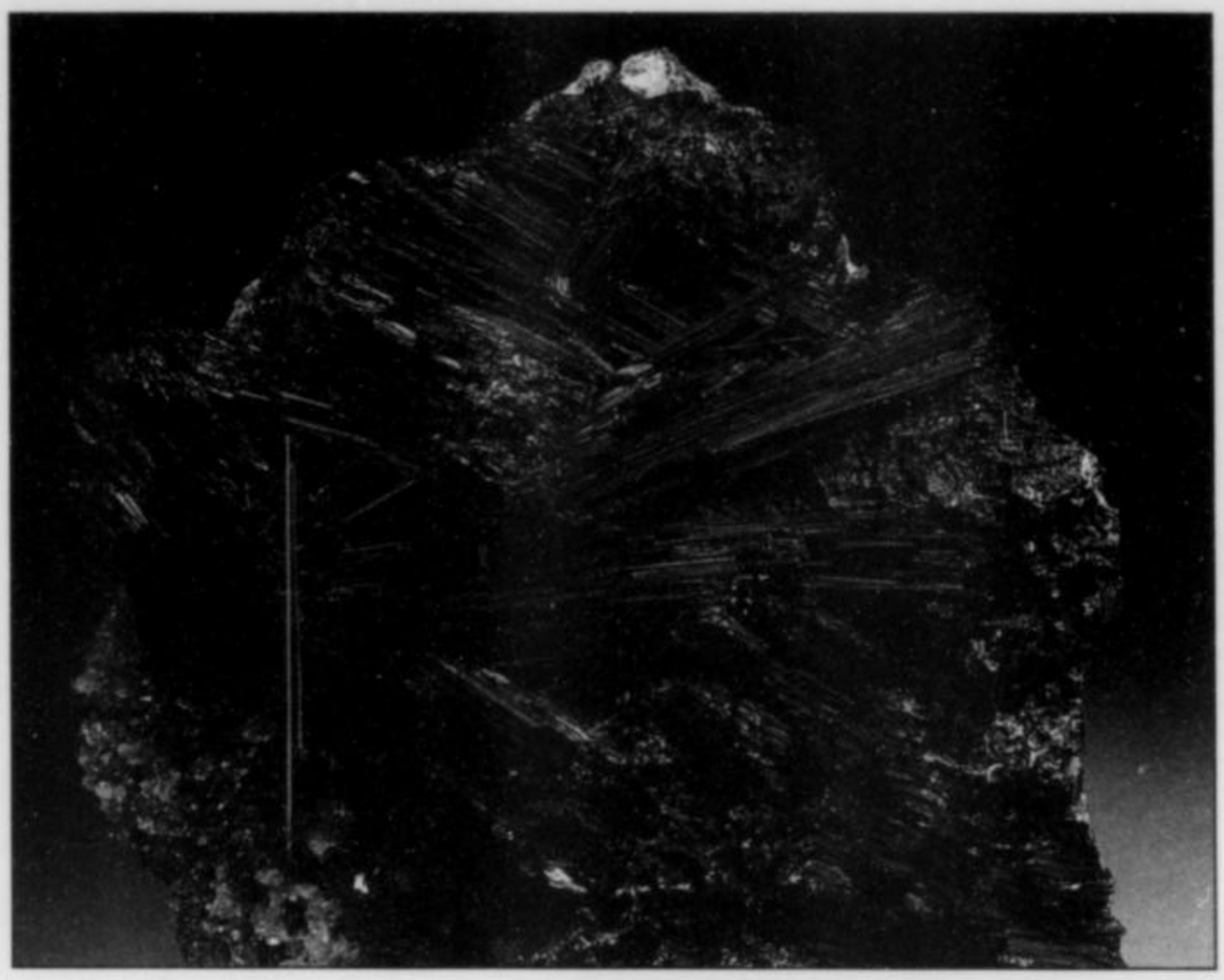
Pyrrhotite crystal, 3.8 cm, on matrix, from the Nikolaevskiy shaft, Dal'negorsk, Primorskiy Kray, Russia.



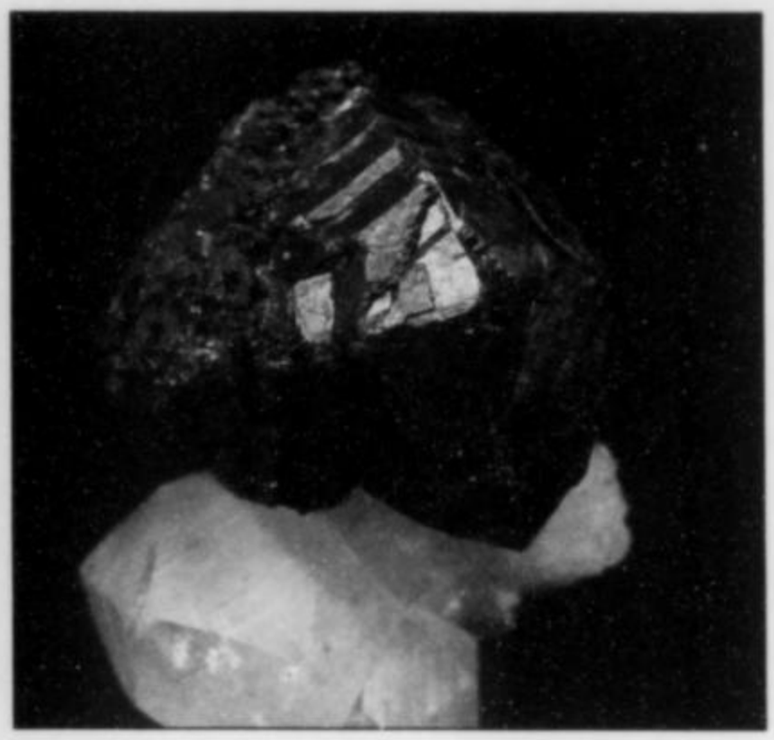
Galena plate of spinel-law twins, 14 cm across, from the Nikolaevskiy mine, Dal'negorsk, Primorskiy Kray, Russia.

English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Bet-Pak-Dala	Бет-Пак-Дала	46°03 70°13	Village deposit steppe	Central Kazakhstan	Scheelite, *betpakdalite usually refers to Karaoba (=Dzhambul)
Biserskogo also **Yushno-Saranovskoe**	Бисерского Южно-Сарановское		Deposit	Part of Saranovskaya Mountain	*Uvarovite, *shuiskite
Bodaybo	Бодайбо	57°52 114°05	Town	Irkutskaya Oblast'	Gold crystals
Bodijbo—see Bodaybo					
Bogoslovskiy	Богословский	59°45 60°02	Mine	Yekaterinburg Oblast' Southern Urals	Gold, copper
Bor Quarry, Bohr Pit—see Boron Pit					
Boron Pit (Quarry)	Борное Месторождение or Карьер "Бор"		Quarry	At Dal'negorsk	Datolite, prehnite, quartz, apophyllite
Borshchovochny, Borschchovochni, Borshchovochniy, Borschchovchnyy—see Borshchovochnyy					
Borshchovochnyy Range	Борщовочный Хребет		Mountains on the S bank of Shilka river, to Mongolian border	Chitinskaya Oblast'	Elbaite, smoky quartz with muscovite
Borzya	Борзя	50°24 116°35	Town	Chitinskaya Oblast' on the Onan River	(See Klichka, Adun Chilon)
Cavalerovo, Cavalervo—see Kavalerovo					
Cedon—see Kedon					
Chabarowski, Chabarovskij—see Khabarovsk					
Chara	Чара		River	Yakutsk (Sakha) A.S.S.R.; joins Olekma near Olekminsk	(See Murun)
Chauvay	Чаувай	40°08 72°08	Village	Osh Oblast', Kyrgyzstan, SSE of Fergana, Uzbekistan	Cinnabar
Chauway—see Chauvay					
Chelabinsk, Cheljobinsk—see Chelyabinsk					
Chelyabinsk	Челябинск	55°12 61°25	City, Oblast'	Southern Urals	
Chemkent—see Chimkent					
Chernyshevskiy	Чернышевский	62°59 112°35	Settlement	Yakutsk (Sakha) A.S.S.R. at confluence of Vilyuy and Akhtaragda rivers	*Grossular, andradite, vesuvianite ("vilyuite"), "achtaragdite"
Cherskogo Mtns.	Черского Горы		Range	From Northern Yakutia (Sakha) into Magadan Oblast'	
Chibine, Chibini, Chibiny—see Khibiny					
Chimkent—see also Shymkent	Чимкент	42°16 69°05	City, Oblast' (oblys)	Kazakhstan	Rutile in quartz

English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Chita, Chitinskaya Oblast'	Чита, Читинская	53°03 113°25	City, Oblast'	Transbaykal	
Chukchi Avt. Okrug—presumably Chukotskiy Nats. Okrug					
Chukotka—see Chukotsk					
Chukotsk, Chukotskoe Sea	Чукотск, Чукотское Море		Peninsula, mountains, sea	Chukotskiy Nats. Okrug, and nearby	(See Iul'tin)
Chukotskiy Nats. Okrug	Чукотский Нац. Округ		National Okrug	NE corner of Asia	
Cola—see Kola					
Crimea (conventional expression for Krym)	Крым		Peninsula, republic	Northern Black Sea, Ukraine	(See Pervomayskoe, Kerch)
Dal'negorsk	Дальнегорск	44°18 135°51	Town	Primorskiy Kray on the Sea of Japan	See Nikolaevskiy Mine, Boron Pit, First and Second Sovietskiy Mines
Dalnegorsk, Dalnygorsk, Dalnyegorsk Dalnjegorsk—see Dal'negorsk					
Danburitovaya Mine			Mine	Malkhanskiy Mountains	Bismutocolumbite
Dara-i-Pioz	Дара-и-Пиоз		Glacier, alkaline intrusion, river to Surkhob River	Alay Mountains, near village of Khait, E of Garm (see), Garm Oblast' (Viloyat)	*Baratovite, *cesium-kupletskite, *darapiosite, hejtmanite, sogdianite, steacyite, stillwellite-Ce, *tadzhikite, *tienshanite, zektzerite
Dara-Pioz, Dara-Piorz, Dara-Pios—see Dara-i-Pioz					
Daschkesan, Daszkesan—see Dashkesan					
Dashkesan	Дашкесан	40°29 46°05	Town	Azerbaijan	Magnetite (xls), epidote, calcite, andradite, apatite, glaucodot, safflorite, cobaltite
Dodo	Додо		Mine	Near Puyva; 4 km from Neroyka; probably on Khus'oyka Mountain	Brookite, quartz gwindels, titanite on calcite (See also Puyva, Khus'oyka, Neroyka)
Dolgano-Nenetskiy, Dolgan-Nenets Avt. Okrug—see **Taymyrskiy Nats.Okrug.**	Долгано-Ненецкий Нац. Округ		Autonomous Okrug		
Donetsk	Донецк	48°00 37°50	Oblast' city	Ukraine	
Dsambil, Dsambul—see Dzhambul					
Dscheskasgan, Dzezkazgan—see Dzhezkazgan					
Dsumbul—see Dzhambul					
Dzhambul (this is also the Turkic transliteration) (=Karaoba)	Джамбул	47°07 71°43	Settlement, mine (do not confuse with Dzhambul (Turkic: Zhambyl) a city at 42°50 71°25 and Oblast', also in Kazakhstan)	Karaoba, Karaganda Oblast', in Bet-Pak-Dala Steppe	Cosalite, quartz, fluorite, wolframite, pyrite, sphalerite, covellite, bertrandite, rhodochrosite. Karaoba is the same village.

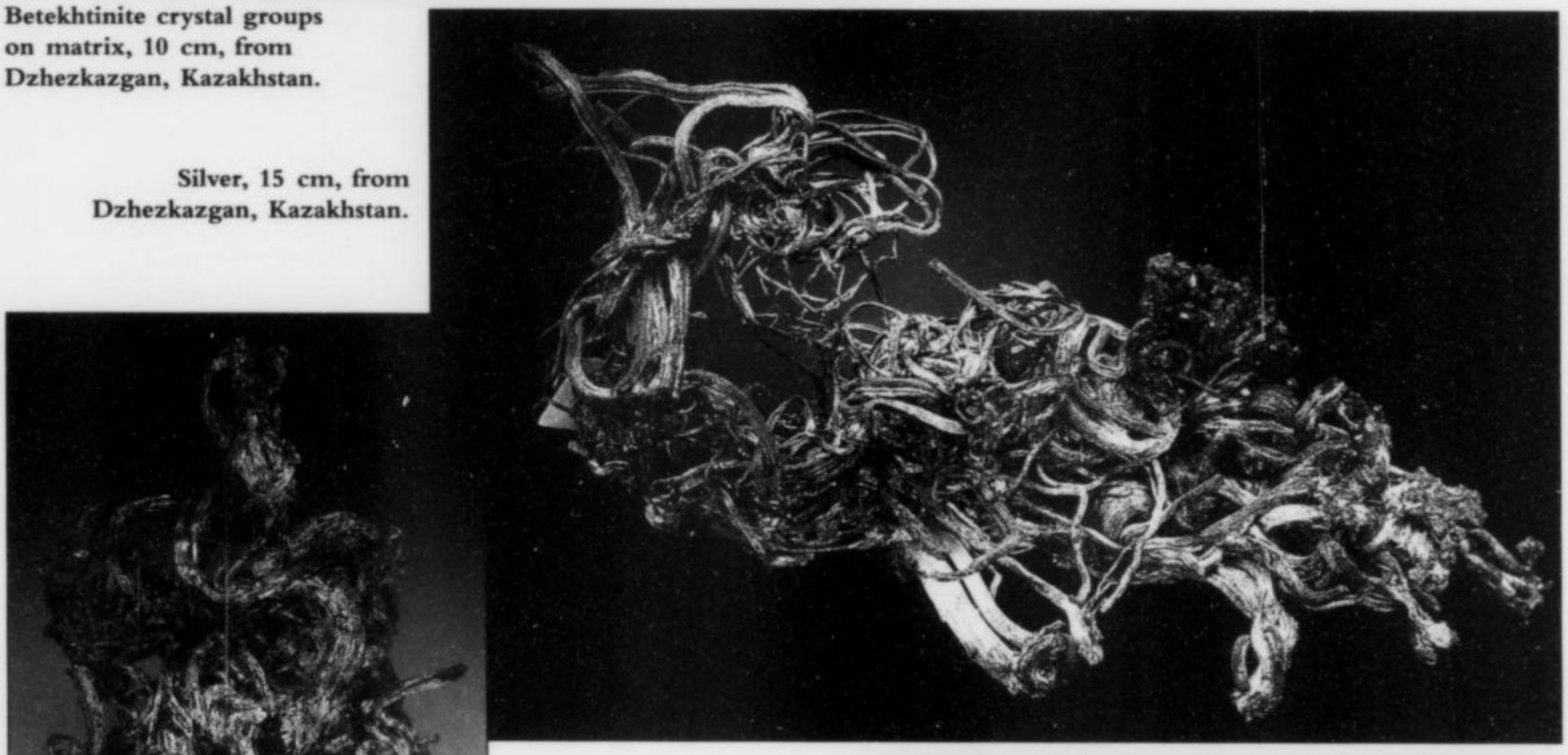


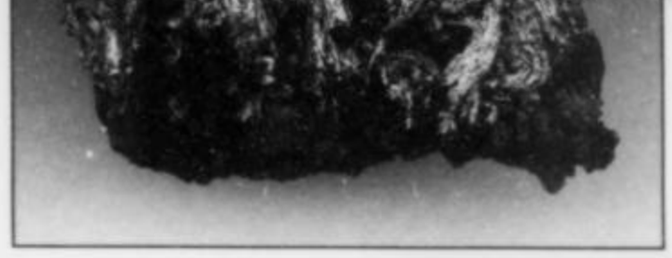
Betekhtinite crystal groups on matrix, 10 cm, from Dzhezkazgan, Kazakhstan.



Bornite crystal, 2.4 cm, on calcite from mine #57, 75-meter level, Dzhezkazgan, Kazakhstan.

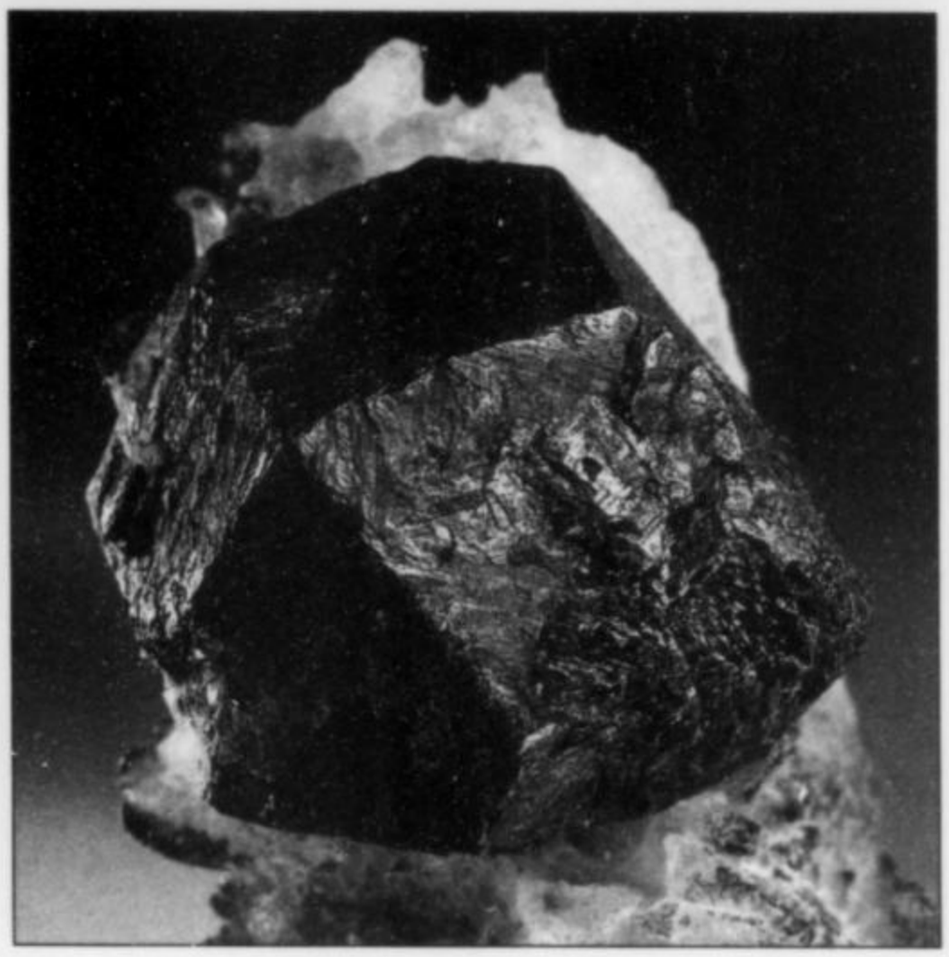
Silver, 15 cm, from Dzhezkazgan, Kazakhstan.

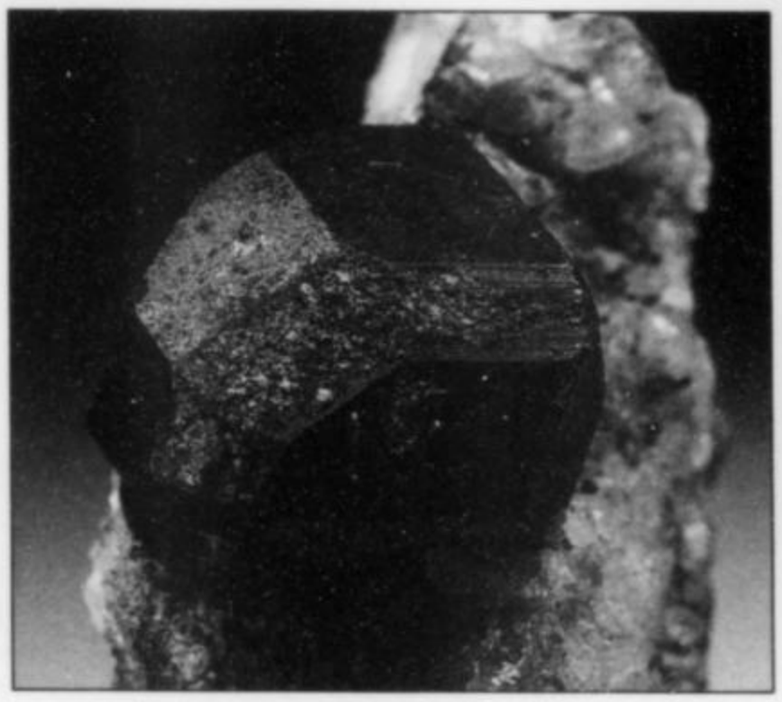




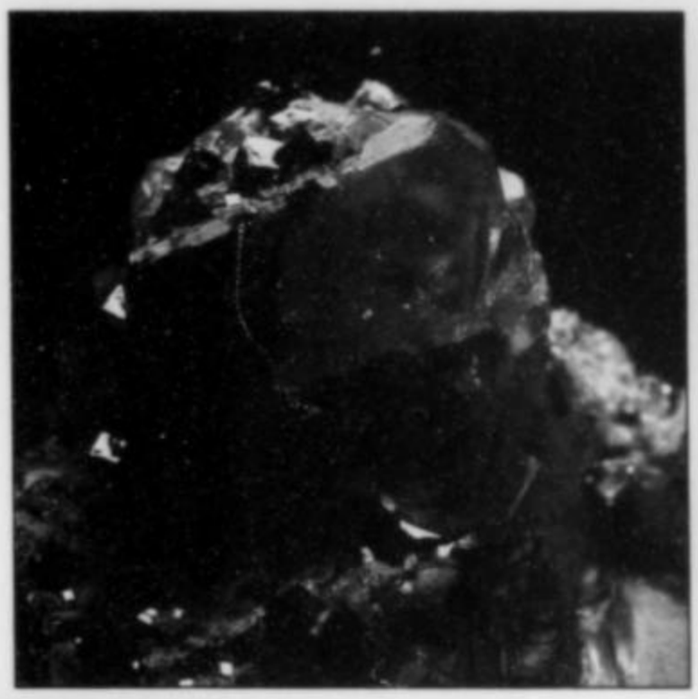
Wire silver, 4 cm, from Dzhezkazgan, Kazakhstan.

Bornite, a superb 2-cm dodecahedron from Dzhezkazgan, Kazakhstan.





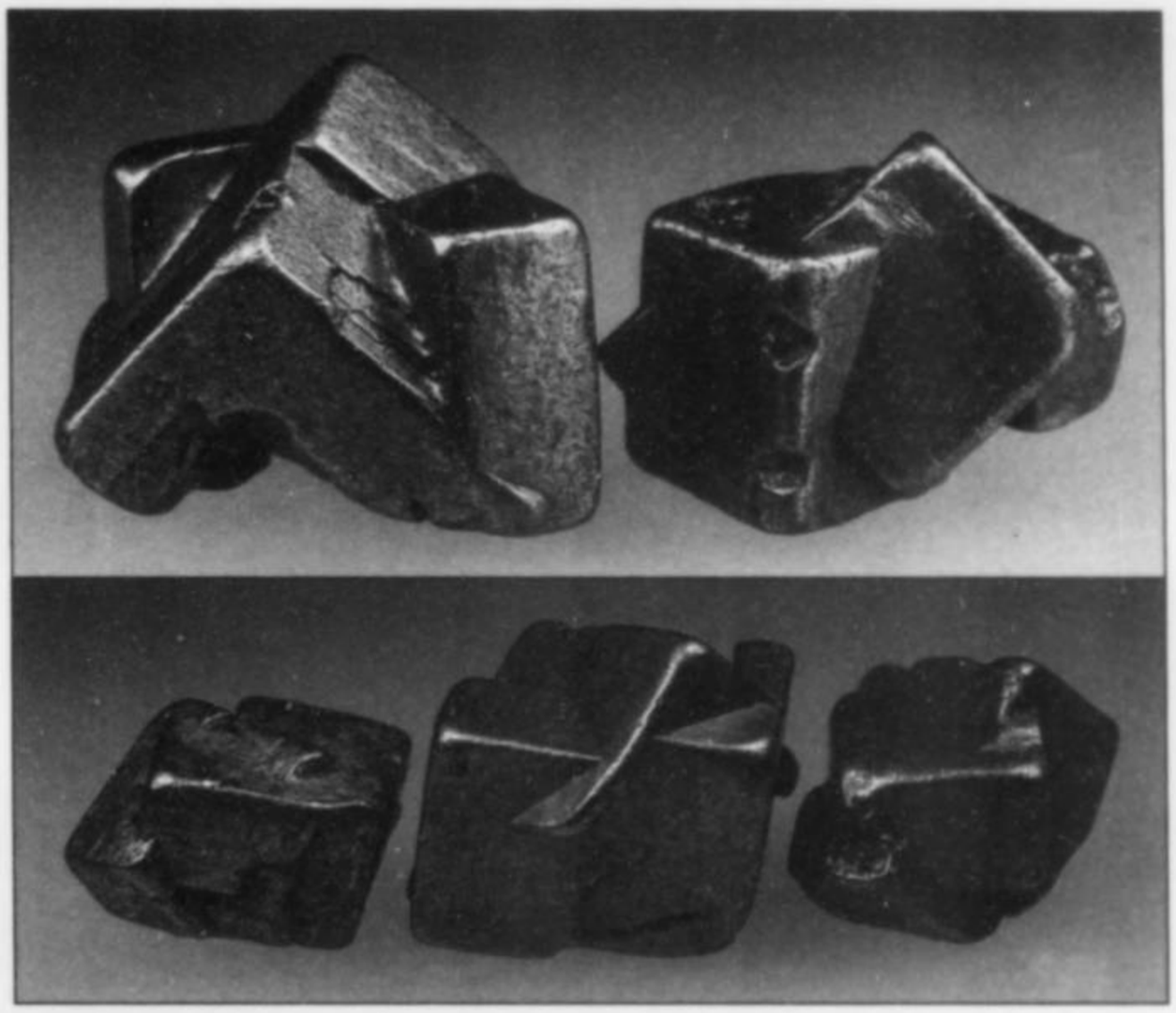
Tennanite crystal, 1.2 cm, from Dzhezkazgan, Kazakhstan.



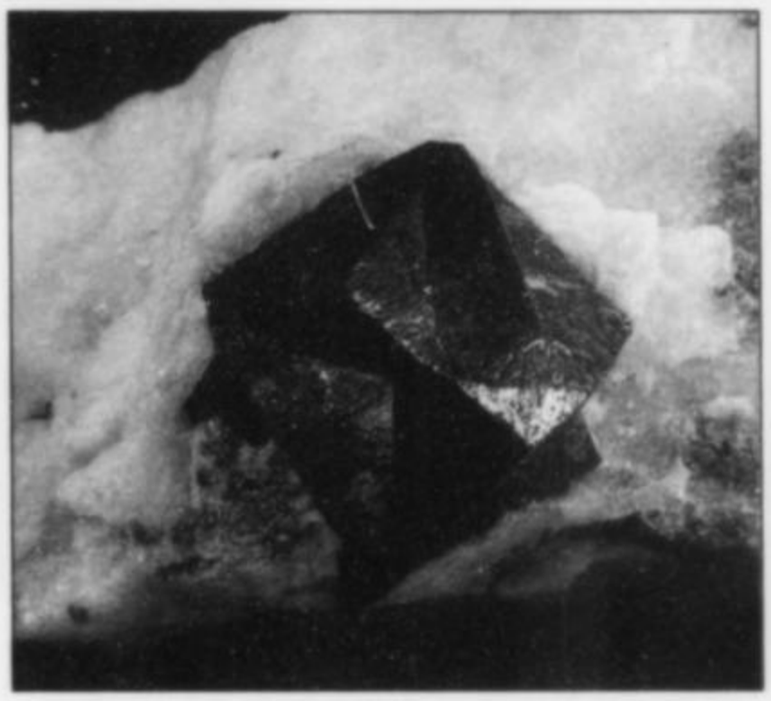
Fluorite octahedron, 2.3 cm, with pyrite from Karaoba, Kazakhstan.

Cosalite crystals, to 2 cm, with pyrite from Karaoba, Kazakhstan.

Clinohumite crystal, 1.9 cm, from Kukh-i-Lal, Pamir Mountains, Tajikistan.

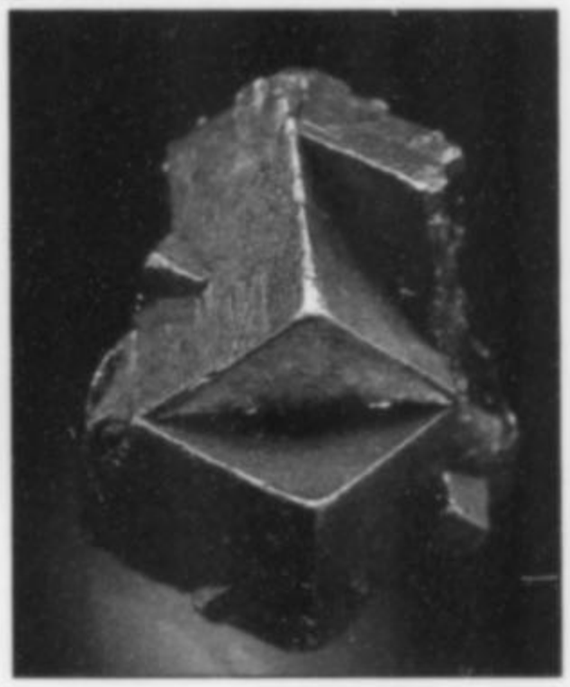


Kovdorskite crystal with an attractive pale blue color, 2 cm, from Kovdor, Kola Peninsula, Russia.



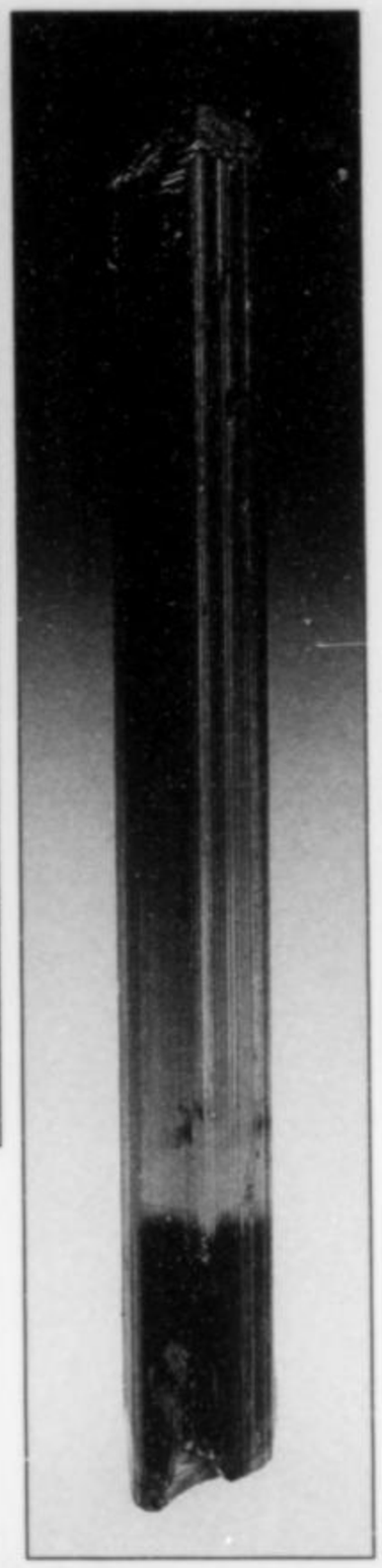
Loparite twin, 1.4 cm, from the Khibiny Tundra, Kola Peninsula, Russia.

Platinum penetration twins *(above and below)* to 1.5 cm, from Konder, near Nel'kan, Ayano-Mayskiy region, Khabarovsk Kray, Russia.

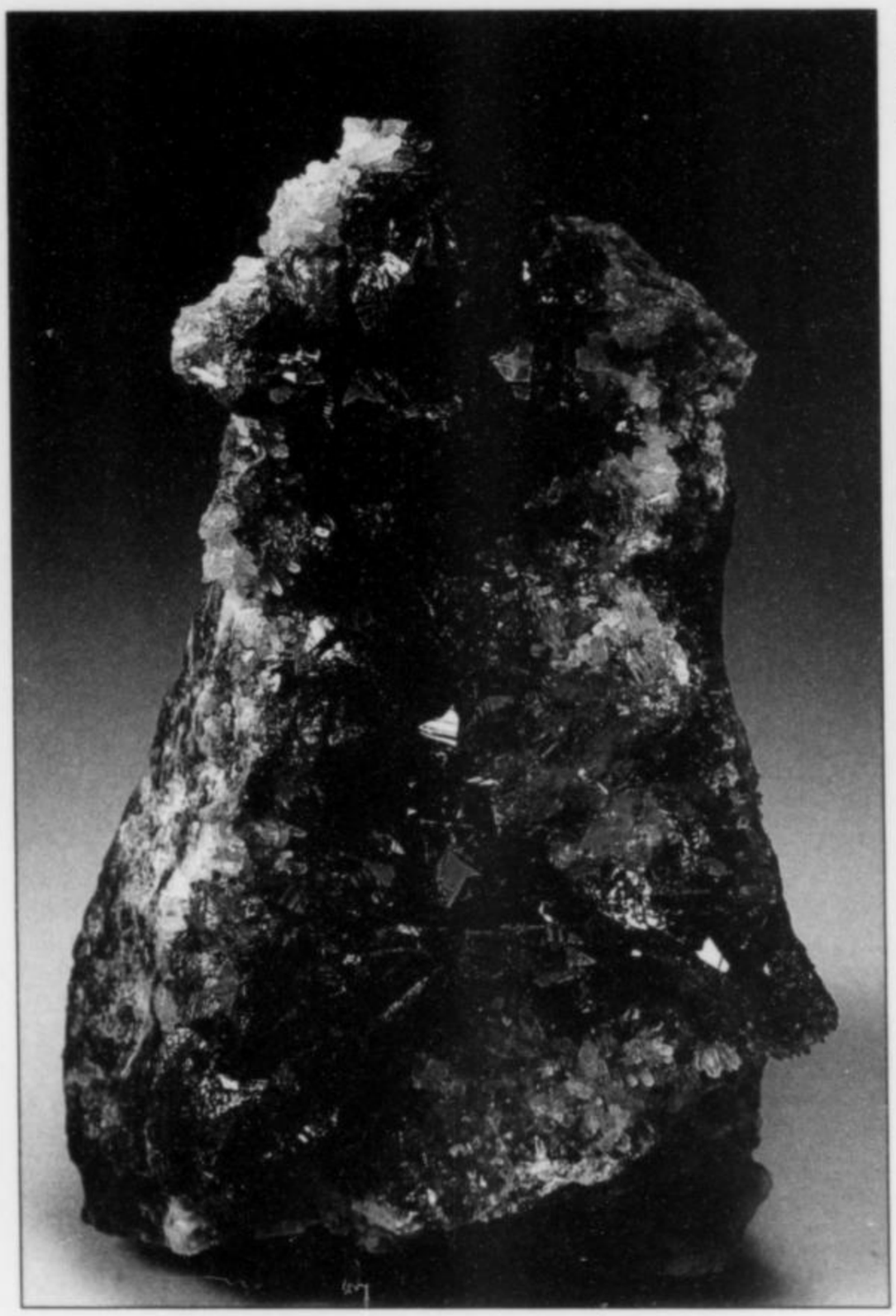


English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Dzhezkazgan (see also Zhezqazghan)	Джезказган	47°48 67°24	City, Oblast', mine shaft (#46, #57, #31, #55)	Kazakhstan	Sphalerite, bornite, chrysocolla, covellite, chalcocite, chalcopyrite, quartz, copper, betekhinite, pyrite, galena, calcite, silver, celestine, djurleite, tennantite
East Siberian Sea	Восточно-Сибирское Море		Sea	Arctic Ocean between Alaska and New Siberian Islands	
Ekaterinburg—see Yekaterinburg					
El' brusskiy (Э→E, not Ye; foreign derivation)	Эльбруский	43°35 42°08	Town mine	Karachay-Cherkesskaya A.O., on the Kuban' River	Orpiment
Elbroska—see El'brusskiy					
Eulytin—see Iul'tin					
Eveslogchorr (Э not to Ye; Lapp derivation)	Эвеслогчорр		Mountain	SE Khibiny Massif	Eudialyte, astrophyllite, wadeite, *denisovite, *fersmanite, corundum, priderite, epididymite
Eveslogtchorr, Eveslovehor—see Eveslogchorr					
Fergana (Uzbek: Farghona)	Фергана	40°23 71°19	City, Oblast'	Uzbekistan	(See Chauvay, Kadamzhay)
First Sovietskiy Mine	Первый Советский Рудник		Mine	At Dal'negorsk	Andradite, apophyllite, danburite, datolite, hedenbergite, ilvaite, manganaxinite, quartz
Frunze—see Kadamzhay					
Garm	Гарм	39°04 70°23	Town, Oblast' (Viloyat)	Tajikistan	(See Dara-i-Pioz)
Gaurdak	Гаурдак	37°39 66°03	Town	Lebap Oblast'	Gypsum, sulfur
Gazimurskiy Mountains	Газимрский Хребет		Range	Chitinskaya Oblast' SE of Nerchinsk	(See Soktuy)
Gorno-Badakhshanskaya Oblast'	Горно-Бадахшанская ОБласть		Autonomous Oblast' (A.O.) or: Viloyat	Tajikistan	
Guardeck—see Guardak					
Gumeschevskoje—see Gumeshevskiy					
Gumeshevskiy Mine	Гумешевский Рудник		Mine	Yekaterinburg Oblast' SSW of Yekaterinburg, near Sysert'	Malachite!, cuprite, copper, plancheite
Hibini, Hibina—see Khibiny					
Hungtukun—see Khungtukin					
Il'men (Il'menskie Mountains)	Ильмен (Ильменские Горы)	55°15 60°12	City low mountain	Chelyabinsk Oblast 80 km WSW of Chelyabinsk	Topaz, beryl, amazonite, *ilmenite, tourmaline, spessartite, *samarskite, phenakite, monazite, *aeschynite, *cancrinite, zircon

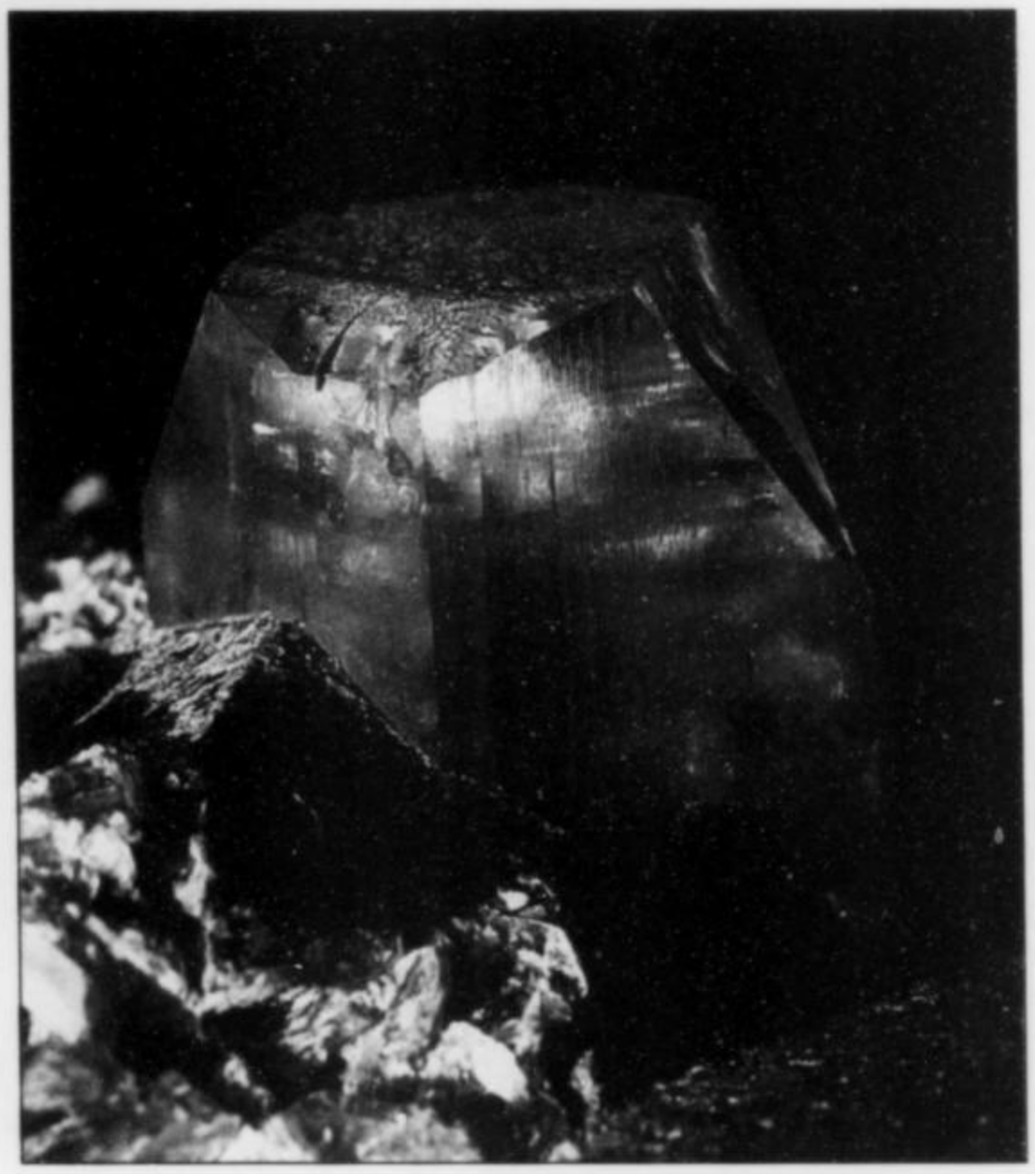
English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Ilim	Илим	56°45 103°50	Town river	Irkutskaya Oblast'	(See Korshunovskoe)
Inagli	Инагли		Massif	Aldan District, Yakutsk A.S.S.R (now Sakha Republic)	Chrome-diopside, batisite, strontium-apatite, lamprophyllite, leucosphenite, *inaglyite, innelite, vinogradovite
Inchoun	Инчоун	66°16 170°17W	Community	Magadan Oblast' Chukotskiy Peninsula	(See Pribezhnoe)
Inder(borskiy)	Индер (борский)	48°31 51°44 (town)	Lake (town)	Western Kazakhstan Oblast', Caspian Plain	*Preobrazhenskite, kaliborite, *gorgeyite, *inderite, *inderborite, hydroboracite, sylvite, *kurnakovite
Inderskoje—see Inder					
Indigirka	Индигирка		River	Yakutsk (Sakha) A.S.S.R. flows to W end of East Siberian Sea	(See Sarylakh)
Inta	Инта	66°04 60°01	Town	Komi A.S.S.R.	Citrine
Irkutsk	Иркутск	52°18 104°15	City, Oblast'	West of Lake Baykal	
Iul'tin	Иультин	67°43 178°56W	Town region	Chukotskiy Nats. Okrug, east Chukotsk Mountains	Beryl, cassiterite, wolframite, muscovite, quartz, scheelite, topaz (See also Svetloe, Tenkergin)
Iuljtin—see Iul'tin					
Izumrudnye kopi "Emerald pits (mines)"	Изумрудные Копи	57°05 61°23	Town mining region, about 50 km N-S and 15 km E-W	Yekaterinburg Oblast' 48 km ENE of Yekaterinburg	Emerald, *phenakite, *alexandrite, bromellite (See also Malyshevo)
Jakutia—see Yakutsk, A.S.S.R.					
Jenisejskiy Krjaz—see Yenisey					
Jubilee—see Yubileynaya					
Kachkanar	Качканар	58°45 59°23	Quarry mountain	Yekaterinburg Oblast' 60 km NNW of Nizhniy Tagil	Magnetite
Kadamzhai, Kadamdzai, Kdamzay, Khadamschai, Khadamdjai, Kadamjaz—see Kadamzhay					
Kadamzhay, Kadamdzhay (both are acceptable) ex-Frunze	Фрунзе	40°07 71°44	Village large antimony mine	Osh Oblast', Kyrgyzstan, S of Fergana (Uzbek: Farghona)	Calcite, cinnabar, orpiment, fluorite, gypsum, quartz, stibnite, realgar, valentinite, kermesite, stibiconite
Kamchatka	Камчатка		Peninsula	Separating Bering Sea and the Sea of Okhotsk	*Kamchatkaite
Kamenka	Каменка		River	Chelyabinsk Oblast' 80 km S of Chelyabinsk	Rose topaz, euclase Includes Andree-Yul'evskiiy and Proroko-Il'inskiy mines
Kamysch-Burun—see Kerch					



Dravite, 4.5 cm long, from the Mikhaylovskoe mine, Malkanskiy Mountains, Chitinskaya Oblast', Russia.



Gold crystals, 3.8 cm across, from the Lena River district, Yakutsk, Siberia.

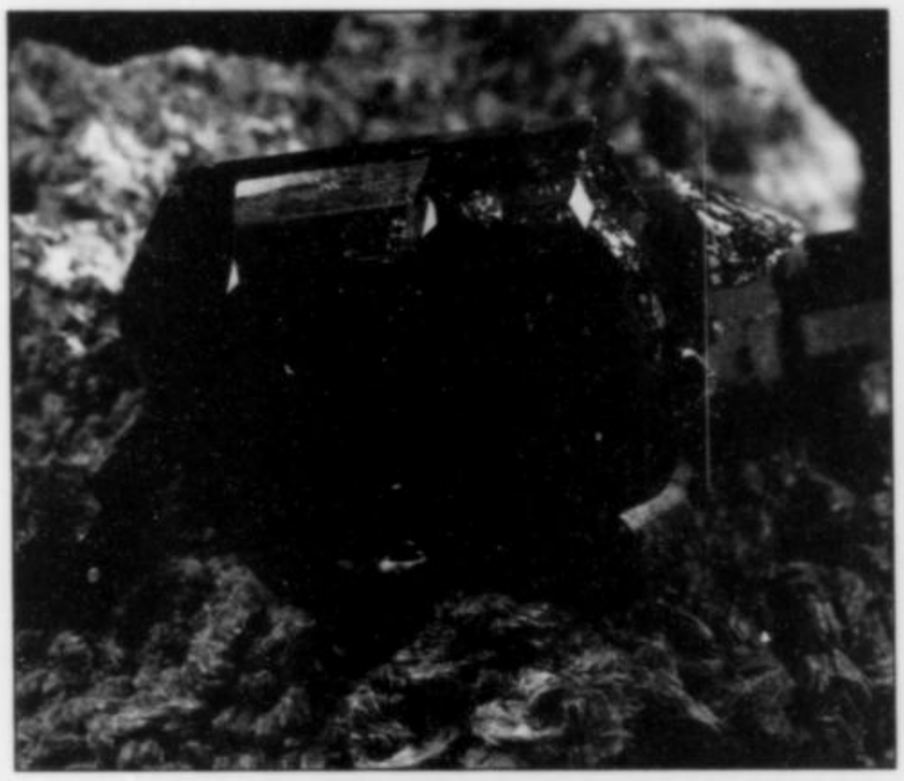


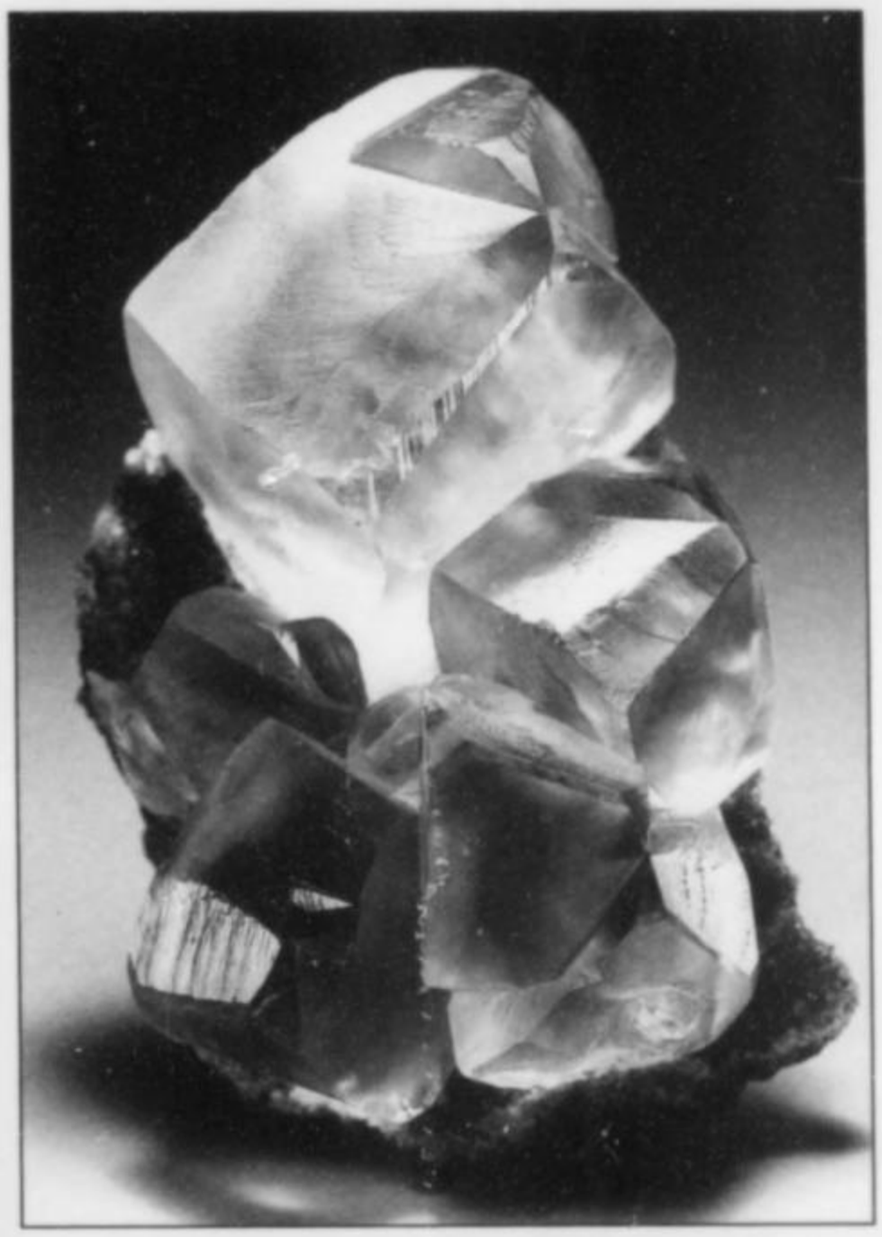
Cinnabar crystal group, 7 cm, from the Nikitovka mine, Ukraine.

Topaz crystal, 2.5 cm, on smoky quartz from Murzinka, Ural Mountains, Russia.

Beryl crystal, 22.5 cm, on quartz from Murzinka, Ural Mountains, Russia.

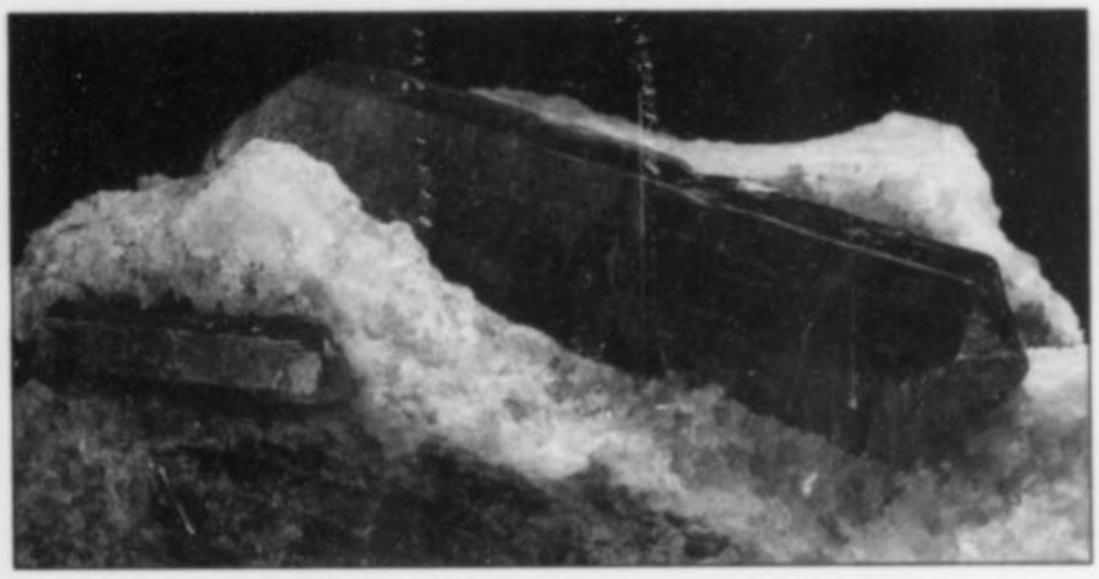
Cassiterite crystal, 1.9 cm, from Merek, Khabarovskiy Kray, Russia.





Calcite, an 11-cm group of crystals to 5.5 cm from Rudnyy, Kazakhstan.

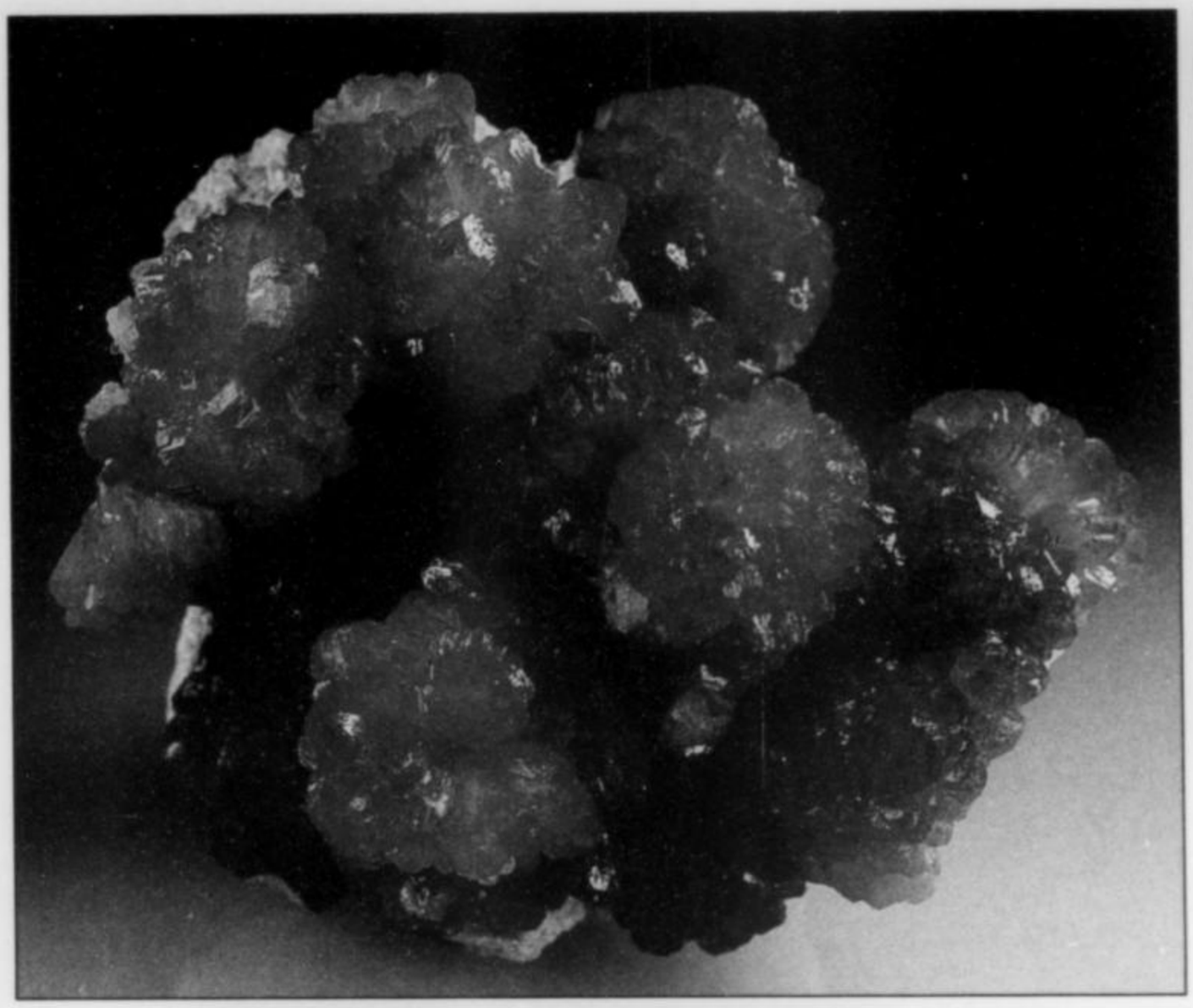
Topaz crystal, 2.6 cm high, Sanarka River, southern Ural Mountains, Russia.



Apatite crystals to 4.2 cm; Slyudyanka.

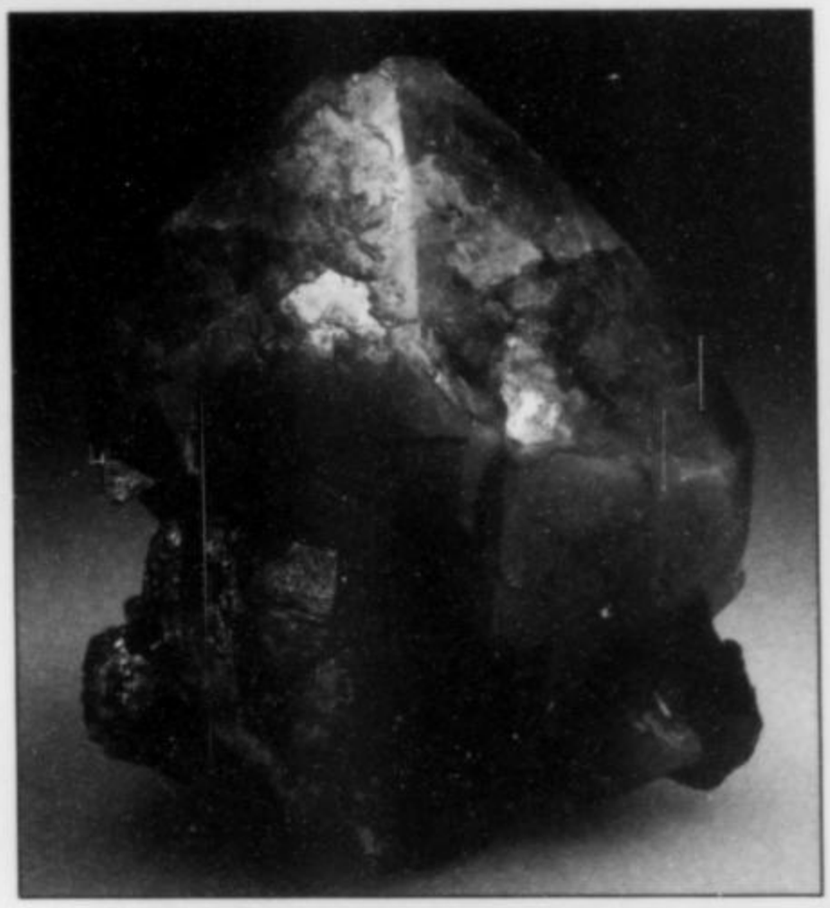
English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Kara Sea	Карское Море		Sea	Arctic Ocean between 55°E and 100°	
Kara-aba—see Karaoba					
Karabakh	Карабах	55°28 60°15	Town	Chelyabinsk Oblast' southern Urals, 82 km WNW of Chelyabinsk	Tennantite, chalcopyrite, quartz, *auricupride, electrum
Karachay-Cherkesskaya Avtonomnaya Oblast	Карачай-Черкесская А.О.		Autonomous Oblast'	Russia, on the NW flank of the Caucasus	(See El'brusskiy)
Karaganda (see also Qaraghandy)	Караганда	49°53 73°07	City, Oblast'	Kazakhstan	Cu minerals
Karagonda—see Karaganda					
Karal'veemskoe deposit	Каральвеемское Месторождение		Deposit	Chukotskiy Nats. Okrug; in Severnyy Anyuyskiy Mtns.	Gold crystals on quartz, axinite, aquamarine on matrix
Karamazar	Карамазар	40°54 69°52	Ore field	Tajikistan	Volborthite, malachite
Karaoba (=Dzhambul)	Караоба		Village—same as Dzhambul, place name	Karaganda Oblast' Kazakhstan In Bet-Pak-Dala Steppe	Bertrandite, rhodochrosite, fluorite, huebnerite, quartz with pyrite inclusions, cosalite
Karel'skaya Republic, Kareliya—see Karelya					
Karelia—accepted name (versus Kareliya)	Карелия		Region	North of St. Petersburg, South of Kola Peninsula	
Karnasurt	Карнасурт		Mountain	North Lovozero Massif (see)	*Beryllite, chkalovite, epididymite *kazakovite, *karnasurtite-Ce, *laplandite, loparite, *natrosilite, raite, *nenadkevichite, *olgite, *revdite, umbozerite, villiaumite (See also Yubileynaya)
Kasachstan, Kazachstan—see Kazakhstan					
Kataganda—see Karaganda					
Katherinenbourg—see Yekaterinburg					
Kavalerovo	Кавалерово	44°19 135°08	Town, region	Primorskiy Kray about 40 km WSW of Dal'negorsk	Fluorite, quartz, pyrite (See Krasnyy Chikoy (#2), Sinerechenskoe, Rudnoe)
Kavdor—see Kovdor					
Kazakhstan (both NGS and Cyrillic spelling)	Казахстан		Republic (former S.S.R.)	Central Asia	*Kazakhstanite
Kedon	Кедон		River	Magadan Oblast' tributary of Omolon River, which is tributary to Kolyma River	Amethyst
Keivy, Keivi—see Keyvy					

English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Kemerovo	Кемерово	55°25 86°05	City, Oblast'	Just E of Novosibirsk	
Kent		49°10 76°05	Mountain	Karaganda Oblast', Central Kazakstan	Todorokite
Kerch	Керчь (the terminal soft sign is seldom transcribed)	45°22 36°27	City, strait, peninsula	Crimea Oblast'	Vivianite, anapaite, barite, pyrolusite, psilomelane, gypsum (See also Kamysch-Burun, Taman', Unzaina)
Kertch, Kertsch, Keren—see Kerch					
Keyvy	Кейвы	67°35 38°00	"Heights"	Murmansk Oblast' Kola Peninsula	Almandine, genthelvite, yttrotantalite, sillimanite, plumbomicrolite, hingganite-(Y), and (Yb) (See also Ploskaya)
Khabarovsk	Хабаровск	48°32 135°08	City Kray	Far Eastern Siberia on Amur River	
Khait	Хаит	39°11 70°53	Village	Garmskaya Oblast' Tajikistan on Surkab River	(See Dara-i-Pioz)
Khanty-Mansiskiy Nats. Okrug	Ханты - Мансиский Нац. Округ		National Okrug	Tyumen Oblast' Ob' River plain	
Khatanga	Хатанга	71°59 103°31	Town river	Taymyrskiy Nats. Okrug flows to Laptev Sea	
Khaydarkan	Хайдаркан	39°58 71°20	Town, large Hg mine	Osh Oblast' Kyrgyzstan, N slope Alay Mountains	Getchellite, livingstonite, stibnite, cinnabar, realgar, orpiment, barite, calcite
Khibiny	Хибины	67°48 33°48	Mountains (1240m), massif, "tundra"	Near Kirovsk Kola Peninsula Murmansk Oblast'	Astrophyllite, catapleiite, corundum, delhayelite, eudialyte, *fenaksite, *khibinskite, ilmenite, loparite, lorenzenite, lovozerite, *mangan-neptunite, murmanite, nepheline, *rasvumite, titanite, tundrite, villiaumite, *yuksporite (See also Eveslogchorr, Koashva, Rasvumchorr, Yukspor)
Khit-ostrov	Хит-остров		Deposit, island	Northern Karelia, in Verkne, Pulongskoe Lake	Rose corundum
Khorog	Хорог	37°30 71°36	Town	Gorno-Badakhshanskaya A. O.	(See Kukh-i-lal)
Khungtukin			Intrusion	Taymyrskiy Nats. Okrug, 200 km SW of Khantanga	Cohenite, copper, ilmenite, native iron, troilite, wustite
Khus'oyka	Хусьойка		Mountain	Holds Puyva deposit	See Puyva, Dodo, Neroyka
Kirgiziya, Kirgizstan—see Kyrgyzstan	Киргизия Киргизстан				
Kirovsk	Кировск	67°37 33°39	City	Murmansk Oblast' western Kola Peninsula. On S flank of Khibiny Massif	(See Khibiny, Afrikanda)



Beryl crystal, 5.5 cm, from mine no. 2, Volodarsk-Volynskiy, Zhitomir Oblast', Ukraine.

Stellerite crystal group, 5.5 cm across, from the Sarbayskiy mine, near Rudnyy, Kustanay Oblast', Russia.

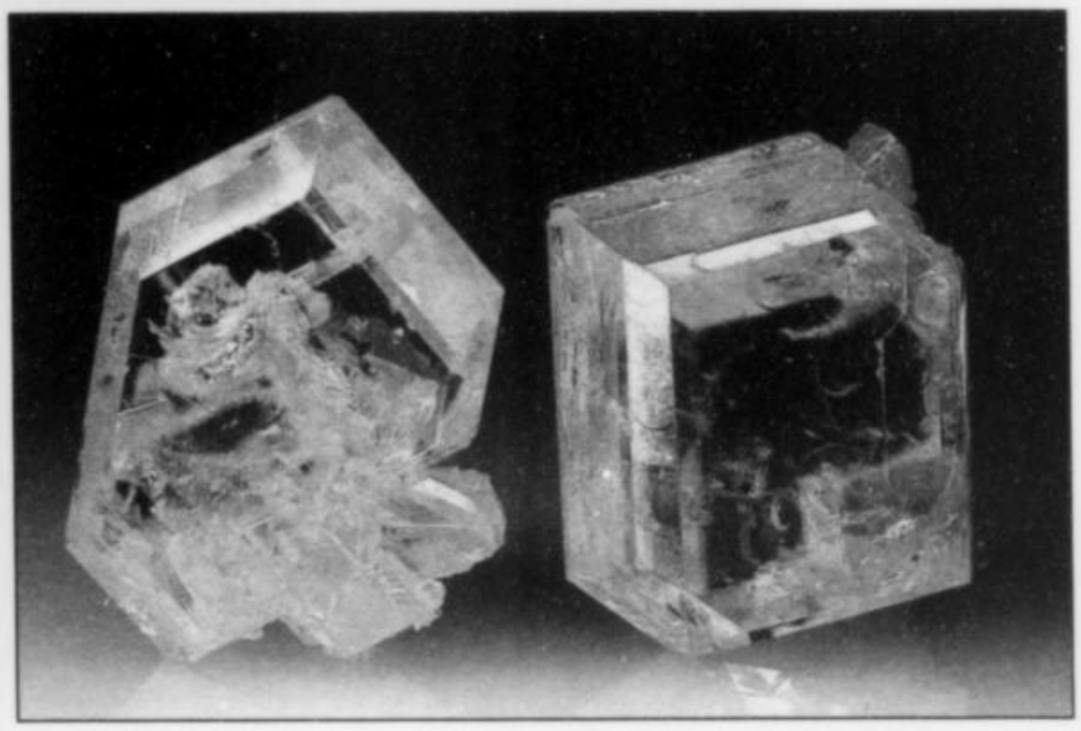


Scheelite crystal, 4.5 cm, from the Tenkergin Chukotsk region, Magadan Oblast', Russia.

Pyrochlore crystals to 8 mm, from Vishnevogorsk, vein no. 140, middle Urals, Russia.

Sulfur crystals to 2.9 cm, from the Yavokskoe mine, near Novoya Vorovsk, L'vov Oblast', Ukraine.

Sperrylite crystal, 1.7 cm, in sulfide matrix from the Talnakh deposit near Noril'sk, northern Russia.



English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Klichka	Кличка	50°28 118°01	Village deposit	Chitinskaya Oblast' 110 km E of Borzya	Calcite, fluorite, hemimorphite, jamesonite, leadhillite, quartz, stellerite
Klick, Klicka, Klitchka—see Klichka					
Klyuchevskaya Sopka	Ключевская Сопка	56°03 160°38	Volcano	Kamchatka	Sal ammoniac
Koashva	Коашва		Settlement	Murmansk Oblast' SE Khibiny massif	Eudialyte, aegerine, *arctite, lomonosovite, *tisinalite, *zirsinalite
Kochoulak, Kochbulak—see Koshbulak					
Kohy-Lal—see Kukh-i-Lal					
Kola	Кола		Peninsula	Murmansk Oblast' NW Russia, between Barents and White Seas	
Kolyma	Колыма		River	E Yakutia (Sakha) and N Magadan Oblast', to East Siberian Sea	*Kolymite
Komi	Коми		A.S.S.R.	NE European Russia, W of Tyumen' Oblast'	
Komsomol'skiy	Комсомольский		Mine	Talnakh deposit Noril'sk	Iowaite (See also Talnakh)
Konder	Кондер		Massif	Near Nel'kan	*Cuprorhodsite, *cuproiridsite, erlichmannite, isoferroplatinum, *konderite, laurite, malanite, monticellite, lamprophyllite, platinum crystals, sperrylite
Kopeysk	Копейск	55°08 61°39	Town	Chelyabinsk Oblast' 13 km from Chelyabinsk	Burning coal yielding *svyatoslavite and other rare minerals
Kora-Oba—see Karaoba					
Korshunikha—see Zheleznogorsk					
Korshunovskoe Deposit	Коршуновское Месторождение	56°30 104°10	Deposit	Irkutskaya Oblast' near Ilim	Clinochlore, *ekaterinite, hematite, amethyst, diopside, *shabnyite, hornblende, *korshunovskite
Koshbulak	Кошбулак	40°50 73°36	Village	Uzbekistan	Altaite, calaverite, hessite, native tellurium, tetradymite, hübnerite, bournonite, plagionite, joseite
Kounrad	Коунрад	46°48 74°59	Town	Karaganda Oblast' near Balkhash	Bertrandite, beryl, bornite, muscovite, molybdenite, rhodochrosite, calcite, wolframite, sphalerite, pyrite, quartz, scheelite
Kounradskiy—see Kounrad					

English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Kovdor	Ковдор	67°34 30°24	Town massif	Murmansk Oblast', Western Kola Peninsula	Baddeleyite, bobierrite, collinsite, forsterite, *kovdorskite, diopside, labuntsovite, magnetite, manasseite, perovskite, sjögrenite, francolite, "tetraferriphlogopite"
Kowndradskij—see Kounrad					
Krasnodar	Краснодар	45°02 39°00	City Kray	Russia NE of Black Sea	
Krasnoy Chikoy, Krasnoi Tschukoi—see Krasnyy Chikoy					
Krasnoyarsk, Krasnoyarskiy	Красноярск Красноярский	56°05 92°46	City, Kray	Central Siberia	
Krasnyy Chikoy	Красный Чикой	50°25 108°45	Town	Chitinskaya Oblast'	Rubellite (See also Mikhaylovskoe)
Krasnyy Chikoy (#2)			Mine	Primorskiy Kray at Kavalerovo (see)	Arsenopyrite, calcite, octahedral fluorite, quartz
Krim—see Crimea					
Krym—correct transliteration for Crimea (which see)	Крым				
Kuban'	Кубань		River	Drains N slope of Caucausus Mtns. to Kersch Strait	
Kuche-lal, Kui-Lal—see Kukh-i-lal					
Kukh-i-Lal also: **Kukhilyal**		37°11 71°27	Mine	Gorno-Badakhshanskaya A.O., 40 km S of Khorog, 1.5 km above Pyandzh River in SW Pamirs, Tajikistan	Clinohumite, scapolite, gem spinel!
Kukisvumchorr	Кукисвумчорр	67°44 33°40	Mountain	Khibiny	Eudialyte, *vinogradovite, lepidomelane, natrolite, amicite, villiaumite, barytocalcite
Kustanay (see also Qostanay)	Кустанай	53°15 63°40	City, Oblast'	Kazakhstan	(See Rudnyy)
Kusteni—see Kustanay					
Kyrgyzstan (NGS recommended spelling of Kirgiziya)			Republic (former S.S.R.)	Central Asia	
Kyshtym	Кыштым	55°43 60°32	Town	Chelyabinsk Oblast', between Yekaterinburg and Chelyabinsk	(See Saranovskaya)
L'vov (traditional name) L'viv (official Ukranian name)	Львов	49°50 24°00	City, Oblast'	Western Ukraine	See Yavokskoe
Laptev Sea	Море Лаптевых		Sea	Arctic Ocean between 110°E and 140°	
Lebap	Лебап		Oblast' or: Welayat	Eastern Turkmenistan	

English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Lena	Лена		Giant river, placer district	Central and northern Siberia	Gold
Leninabad (the city is now Khujand)		40°14 69°40	City, Oblast' (Viloyat)	Tajikistan	
Lepkhe-Nel'm	Лепхе-Нельм		Mountain slope	Middle of Lovozero Massif	*Vinogradovite, taenolite, *kupletskite, titanite
Lovosero—see Lovozero					
Lovozero	Ловозеро	68°01 35°08 67°50 34°30	Village, tundra, lake massif (1126m)	Kola Peninsula Murmansk Oblast' 50 km ENE of Kirovsk	Aegerine, *belovite, beryl, *beryllite, columbite, "elaeolite," eudialyte, *gerasimovskite, komarovite, *kupletskite, *labuntsovite, loparite, lorenzenite, *lovozerite, murmanite, mangan-neptunite, *nenadkevichite, *steenstrupine, *vinogradovite, *vitusite, *vlasovite, zircon (See also Alluiyv, Karnasurt, Lepkhe-Nel'm, Yubileynaya)
Lvov, Lviv, Lwow, Lwowsk—see L'vov					
Magadan	Магадан	59°38 150°50	City, Oblast'	On the Sea of Okhotsk	
Malaya-Bystraya River—see Malo Bystrinskoe Deposit					
Malchan, Malkane, Malkhane—see Malkhanskiy					
Maleshevo, Malyeshevo, Malysheva, Malischevo—see Malyshevo					
Malkhanskiy Mountains	Малханский Хребет	50°30 109°	Mountain range	Chita Oblast', partly in Irkutsk Oblast', W end of Yablonovyy Range	Elbaite, danburite, hambergite, amethyst, petalite, topaz (See Danburitovaya, Mikhaylovskoe, Solnetchnaya, Yablonovyy)
Malo-Bystrinskoe deposit	Мало-Быстринское месторождение	51°45 103°25	Deposit	Pribaykal near Slyudyanka on Malaya Bystraya River	Lazurite, afghanite, scapolite, diopside, sodalite, hauyne
Malyshevo	Малышево		Mine	20 km N of Asbest on Tokovaya River, Yekaterina Oblast', Urals. Largest of Izumrudnye Kopi	Emerald, alexandrite, phenakite
Mangut	Мангут	49°45 112°40	Town	Chitinskaya Oblast' near Mongolian border	Beryl
Manty-Mausiiky—see Khanty-Mansiskiy					
Markha	Мархa		River	Yakutia (Sakha)—western tributary of the northern Lena River	
Maya	Мая		River	Large SE tributary to Aldan River	
Mayak	Маяк		Mine	At Talnakh	Hisingerite, sperrylite, *majakite, *shadlunite

English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Mayskiy Range	Хребет Майский	55° 133°	Short mountain range	Khabarovskiy Kray just W of Sea of Okhotsk	
Mednorudiansk	Меднорудянск		Mine	Essentially in Nizhniy Tagil	Malachite!, cuprite, pseudomalachite, delafossite
Merek	Мерек	51°18 134°50	Short stream	Khabarovskiy Kray	Albite, cassiterite
Miass	Миасс	54°59 60°06	Town	Chelyabinsk Oblast' midway between Chelyabinsk and Zlatoust	Aeschynite, zircon
Mikhaylovskoe	Михайловское		Mine	Near Krasnyy Chikoy, Malkhanskiy Mtns., Chitinskaya Oblast'	Elbaite, smoky quartz
Mine #57			Small pit	Dzhezkazgan	Bornite
Mir	Мир		Kimberlite pipe, mine	Mirnyy	Diamond
Mirnyy	Мирный	62°40 113°32	Town	Yakutsk A.S.S.R. (now Sakha Republic)	
Mokruscha—see Mokrusha					
Mokrusha	Мокруша		Mine	Yekaterinburg Oblast' near Murzinka, just S of Alabashka	Albite, blue topaz, heliodor, orthoclase, smoky quartz
Mras-su	Мрас-су	52°18 88°30	Village river	Kemerovskaya Oblast', tributary of the Tom River	Hibonite
Murgab	Мургаб	38°12 74°01	Town, river	Gorno-Badakhsh. A.O.E. Pamir Mtns.	Scapolite (See also Rangkul)
Murmansk	Мурманск	68°59 33°08	City, Oblast'	On the Barents Sea	
Mursinsk, Murzinsk, Mursinka—see Murzinka					
Murun	Мурун		Massif	Aldan, Yakutsk A.S.S.R. (now Sakha) S of Olekminsk, between Olekma and Chara Rivers	Agrellite, anatase, batisite, brookite, canasite, *charoite, *davanite, denisovite, ekanite, fedorite, *murunskite, kalsilite, labuntsovite, *tinaksite, wadeite
Murzinka	Мурзинка	57°42 61°00	Village	Yekaterinburg Oblast' Central Urals, approx 100 km N of Yekaterinburg	Amethyst, aquamarine, elbaite, heliodor, lepidolite, muscovite, *rhodizite, topaz (See also Alabashka, Vatikha)
Nadym	Надым	64°10 99°53	Town river	Krasnoyarskiy Kray flows into Nizhnyaya Tunguska	Apophyllite, calcite, heulandite, mordenite, stellerite, stilbite, thomsonite
Narilsk—see Noril'sk					
Nel'kan	Нелькан	57°40 136°04	Town	Khabarovsk Kray, on Maya River	(See Konder)

English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Nerchinsk	Нерчинск	52°02 168°38	Town	Chita Oblast'	Elbaite, cerussite, susannite, leadhillite, linarite, anglesite, mimetite
Neroyka Mountain	Неройка Гора	64°35 59°44	Mountain	On boundary between Tyumen Oblast' and Komi A.S.S.R.	Prehnite, quartz, titanite (See also Dodo, Puyva, Khus'oyka)
Neroyko—see Neroyka					
Nertschinsk—see Nerchinsk					
Nickel—see Nikel'					
Nidym—see Nadym					
Nikel'	Никель	69°20 29°44	Town	Murmansk Oblast' at the Norwegian border	Scheelite, stibnite, vanadinite, wolframite
Nikitova , Nikitowka—see Nikitovka					
Nikitovka (includes **#2 Bis Mine**)	Никитовка	48°21 38°03	City deposit	Donets'k Oblast' Ukraine	Cinnabar, stibnite
Nikolaevskii, Nicolas, Nicolai, Nicoleyev—see Nikolaevskiy					
Nikolaevskiy	Николаевский		Mine	At Dal'negorsk	Galena, sphalerite, pyrite, chalcopyrite, pyrrhotite, calcite, fluorite, tetrahedrite, *demantoid
Nizhniy Tagil	Нижний Тагил	58°00 59°58	City	Yekaterinburg Oblast' ~140 km N of Yekaterinburg	Platinum, gold, copper, cuprite, tenorite, phosphates (See also Kashkanar, Mednorudiansk)
Nizhnyaya Tunguska	Нижняя Тунгуска		River	Krasnoyarskiy Kray major Yenisey tributary	Very large calcite crystals (See also Anakit, Nadym, Ozernoe)
Nizhnyaya Tura	Нижняя Тура	58°40 59°48	Village	Yekaterinburg Oblast' Central Urals	(See Novo-Frolovskiy)
Noril'sk	Норильск	69°21 88°02	Town	Krasnoyarsk Kray Taymyrskiy Nats. Okrug	Anhydrite, apophyllite, babingtonite, brucite, *cabriite, iowaite, *kharaelakhite, millerite, pectolite, *shadlunite, thaumasite, valleriite (See also Talnakh)
Norilsk—see Noril'sk					
Novo-Frolovskiy Mine	Ново-Фроловский Рудник		Mine	Yekaterinburg Oblast' NE of Nizhnyaya Tura	*Calciborite, *frolovite, *vimsite, *nifontovite, *korzhinskite, *uralborite
Novosibirsk	Новосибирск	55°04 83°05	City, Oblast'	Western Siberia	
Novoya Vorovsk			Village?	Ukraine (L'vov Oblast'?) 80 km from L'vov	see Yavokskoe
Ob'	Обь		Giant river	Western Siberia	
Oktober—see Oktyabr'skiy					
Oktyabr'skiy Mine	Октябрьский Рудник		Mine, shaft	Talnakh deposit Noril'sk	(see Talnakh)

English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Olekminsk **Olekma**	Олекминск Олекма	60°25 120°25	Town River	Yakutsk A.S.S.R. (Sakha) on Lena R. S. tributary of Lena	
Olenegorsk	Оленегорск	68°04 33°15	Town	Murmansk Oblast' Kola Peninsula	Hematite, ilmenite, magnetite, titanite, cummingtonite
Olenitsa	Оленица	66°30 35°19	Village	Murmansk Oblast' Kola Peninsula White Sea Coast	Calcite pseud. ikaite, "glendonite"
Olenjogarsk—see Olenegorsk					
Onon	Онон		River	Chitinskaya Oblast', from Mongolia toward Nerchinsk	
Osh	Ош	40°37 72°49	City, Oblast'	Kyrgyzstan	
Oskemen—transliteration of the Turkic form of Ust'-Kamenogorsk					
Oural—see Ural					
Ozernoe	Озерное		Deposit	Near Tura Nizhnyaya Tunguska river	Analcime, calcite, thomsonite
Paiva—see Puyva					
Pamir	Памир		Mountain range (highest in former U.S.S.R.)	Tajikistan; part in Kyrgyzistan	
Perm' (under Stalin: Molotov)	Пермь (Молотов)	58°01 56°10	City, Oblast'	In Central Urals	
Pervomaiski—see Pervomayskoye					
Pervomayskoye deposit	Первомайскойе месторождение	45°41 33°51	Village, quarry 8 km from village	Crimea Oblast'	Hydroxylapophyllite
Ploskaya	Плоская		Mountain	Keyvy	Holtite, plumbomicrolite, polylithionite, amazonite, *keiviite-(Y), yttrofluorite, *hinganite-(Yb)
Polar Urals	Полярный Урал		Mountain range	Furthest north extension of the Urals	
Prepolar Urals	Приполярный Урал		Mountains	Northern extension of the Urals	
Pribaykal'e	Прибайкалье		Indefinite region	West and south of Lake Baykal	
Pribrezhnoe	Прибрежное		Deposit	35 km NW of Inchoun	Axinite
Primorie, Primorski, Primorsky, Primorskiy', Primor'ye—see Primorskiy Kray					
Primorskiy Kray	Приморский Край		Kray	NE of Vladivostok on the Sea of Japan	
Proroko-Il'inskiy Mine			Mine	See Kamenka River	Topaz
Puj Va, Pui Va, Pouyva, Puiva—see Puyva					

English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Puyva	Пуйва		Village, deposit	Prepolar Urals, 75 km NW of Saranpaul' on Khus'oyka Mountain See also Dodo, Neroyka	Adularia, apophyllite, byssolite, calcite, chalcopyrite, chlorite, ferroaxinite, fluorapatite, muscovite, palygorskite, quartz, titanite
Pyandzh	Пяндж		River	Boundary between Tajikistan and Afghanistan	
Qaraghandy—transliteration of Turkic form of Karaganda					
Qostanay—transliteration of Turkic form of Kustanay			Oblys		
Rangkul' (includes "Vein #86")	Рангкуль	38°30 74°24	Village, massif, lake	Gorno-Badakhshanskaya A.O., Pamir Range, 60 km NE of Murgab	Jeremejevite!, "pegmatite," ruby, scapolite, tourmaline
Rasvumchorr	Расвумчорр	67°38 33°48	Mountain, plateau	Khibiny massif	Delhayelite, "elaeolite," *hydrodelhayelite, lomonosovite, *olympite, *rasvumite, shafranovshite, *shcherbakovite, sidorenkite, pectolite, villiaumite, zirsinalite
Reft	Рефт		River	Yekaterinburg Oblast', flows by Asbest	(See Tokovaya)
Rudniy, Rudyni, Rudnui, Rudnyi—see Rudnyy					
Rudnoe		44°16 135°05	Deposit	Kavalerovo	Cassiterite, tourmaline, arsenopyrite, chlorite, pyrrhotite, chalcopyrite, quartz
Rudnyy	Рудный	53°00 63°40	Town	Kustanay Oblast'	Silver, acanthite, magnetite, copper (See also Sarbay, Sokolovskoe Mines)
Russia	Россия		Republic		
Sakalova-Sarbai—see Sokolovsko					
Sakha			Republic	Modern name for Yakutsk A.S.S.R.	
Sanarka	Санарка		River	Chelyabinskaya Oblast', 65 km WNW of Troitsk	Topaz, gold, beryl, euclase
Saranovskaya Mountain	Сарановская Гора	58°30 58°53	Mountain deposit	Perm Oblast', 90 km NW of Nizhniy Tagil, near Kyshtym	Calcite, clinochlore, millerite, *shuiskite, titanite, *uvarovite (See also Biserskogo)
Saranpaul'	Саранпауль	64°15 60°68	Village	Tyumen Oblast' Khanty-Mansi Nats. Okrug Prepolar Urals	See Puyva
Sarany, Sarani—see Saranovskaya					
Sarbay Iron Mine	Сарбайский Рудник	52°58 63°07	Mine	W of Rudnyy just W of Sokolovskoe Mine	Silver, quartz, chabazite, magnetite, calcite, stilbite, gmelinite, stellerite, chalcopyrite, epidote, prehnite, acanthite

English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Sarnapaul—see Saranpaul					
Sarylakh	Сарылах	59°50 133°10	Deposit	Yakutsk (Sahka) A.S.S.R. near Indigirka River in Cherskogo Mtns.	Kermesite, stibnite, berthierite, *indigirkite
Scherlowaja-Gora—see Shirlovaya					
Schurab—see Shurab					
Second Soviet Mine			Mine	Dal'negorsk	Calcite
Semipalatinsk	Семипалатинск	50°26 80°16	City Oblast'	Kazakhstan	Huge copper nuggets
Servodlovskaya Oblast'—see Yekaterinburg					
Severnyy Anyuyskiy Mtns.	Северный Анюйский Кр.		Mountain range	Chukotskiy Avt. Okrug near East Siberian Sea near Yakutsk (Sakha) A.S.S.R. border	
Shaytanka	Шайтанка		Town	Yekaterinburg Oblast'	Elbaite
Shirlovaya Mountain (Schorl Mountain)	Шерловая Гора	50°32 116°15	Mountain	Chitinskaya Oblast' Adun Chilon Mtns. to the SW	Aquamarine, beudantite, cassiterite, topaz, wolframite, *zavaritskite
Shurab	Шураб	40°03 70°33		Tajikistan Leninabad Oblast' (Viloyat)	Calcite, gypsum, sulfur
Shymkent—Turkic form of Chimkent					
Siberia (accepted name versus "Sibir'")	Сибирь			Russia	
Sinerechenskoe deposit	Синереченское месторождение		Deposit	Primorskiy Kray, W of Kavalerovo	Quartz with actinolite inclusions, andradite
Slivdiana, Sliudianka, Sludianka, Sludyanka—see Slyudyanka					
Slyudyanka	Слюдянка	51°40 103°40	Town	Irkutsk Oblast' Pribaykal	Biotite, calcite, diopside, epidote, fluorapatite, hyalophane, phlogopite, scapolite, spinel, zircon (See also Malo-Bystrinskoe)
Sokolon—see Sokolovsko					
Sokolovskoe Iron Mine		52°58 63°13	Mine	W of Rudnyy, just E of Sarbay Iron Mine	Calcite, chabazite, heulandite, magnetite, silver, stellerite
Soktuy Mountain	Соктуй Гора	50°52 116°37	Mine, village	Chitinskaya Oblast' SW continuation of Gazimurskiy Mtns.	*Jeremejevite, elbaite
Soletchnaya Mine			Mine	Malkhanskiy Mountains	Bismutomicrolite
South Kazakhstan Oblast' (Yuzhno Kazakhstanskaya)	Южно-Казахстанская Область		Oblast'	Southernmost Kazakh Oblast'; next to Tashkent	
Sovietskiy, Sowietsky—see First Sovietskiy					
Surkhab	Сурхаб		River	Drains NW Pamirs and SW Alay Mtns., Tajikistan	

English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Sverdlovsk—Soviet name for Yekaterinburg	Свердловск				
Svetloe	Светлое		Deposit	At Iul'tin	Beryl, topaz, wolframite, albite, löllingite, cassiterite
Sysert'	Сысерть	56°30 60°50	Town	Yekaterinburg Oblast', 40 km SSE of Yekaterinburg	(See Gumeshevskiy)
Tadjikistan—see Tajikistan					
Tadzhik Tadzhikistan—Russian spelling for Tajikistan	Таджик Таджикистан				
Taimyr—see Taymyr					
Tajikistan (NGS recommended spelling of Tadzhikistan)			Republic (former S.S.R.)	Central Asia	*Tadzhikite-(Ce)
Takovaya, Takowaja, Takawaya—see Tokovaya					
Talnach, Talnah—see Talnakh					
Talnakh	Талнах		Ore field, region	Noril'sk. Includes Oktyabr'sk, Taimyr, Mayak, and Komsomolski Mines	*Borishanskiite, *cabriite, chalcopyrite, cubanite, djerfisherite, mooihoekite, paolovite, *palladoarsenide pentlandite, sperrylite, *talnakhite, wurtzite
Taman' Peninsula	Тамань Полуостров	45°12 36°43	Town, bay, peninsula	Krasnodar Oblast' across Kerch Strait from Crimea	*Anapaite
Tamvatneyskiy Massif	Тамватнейский Массив		Massif		Demantoid, magnetite, cinnabar, karpatite, tungstenite, xonotlite
Tashkent	Ташкент	41°16 69°13	Capital city, wiloyat (= Oblast')	Uzbekistan	
Tatarskoe Deposit Tatarka	Татарское Татарка	64°46 87°49	Village deposit river	Yeniseyskiy Kryazh Krasnoyarskiy Kray	Pyrochlore, *tatarskite
Taymyrskiy Nats. Okrug Taymyrskiy Peninsula	Таймырский Нац. Округ Таймырский Полуостров		National Okrug, Peninsula	Kara and Laptev Seas, Arctic Ocean	
Tchita—see Chita					
Tenkergin	Тенкергин	68°35 178°30W	Settlement	Chukotsk Nats. Okrug, 40 km from Iul'tin	Cassiterite, dolomite, ferberite, ferritungstite, fluorite, pyrite, quartz, scheelite, topaz (See also Volchiy)
Tenkering—see Tenkergin					
Tetjuche Pristan—see Tetyuke Pristan' or Dal'negorsk					
Tetyuke Pristan'	Тетюхе-Пристань		Former name of Dal'negorsk		
Thura—see Tura					

English	*Cyrillic*	*Lat/ Long*	*Location · Type*	*Higher Order Location*	*Mineral Species*
Tokovaia—see Tokovaya					
Tokovaya	Токовая		Small river, district	Yekaterinburg Oblast' flows into Reft River 5 km NW of Asbest	Alexandrite, bavenite, emerald, phenakite, rutile (See also Malyshevo)
Tom'	Томь		River	Drains Altay Mountains to Ob' River	
Transbaykal	Забайкалье		Indefinite region	East of Lake Baykal	
Troitsk	Троицк	54°08 61°33	City	Chelyabinskaya Oblast'	
Tschukotka, Tschuktschen—see Chukotsk					
Tuljtin—see Iul'tin					
Tura	Тура	64°20 100°17	City	Krasnoyarsk Kray Evenkiyskiy Nat. Okrug, Nizhnyaya Tunguska River	(See Ozernoe)
Turakuloma Range	Туракулома Хребет		Mountain range	East Pamirs Gorno-Badakshanskaya Avt. Oblast'	Hambergite
Turkmenistan (NGS recommended spelling of Turkemeniya)			Republic (former S.S.R.)	Central Asia	
Turkmeniya—see Turkmenistan	Туркмения				
Tyumen'	Тюмень	57°11 65°29	City, Oblast'	Western Siberia	
Udachnoe	Удачное	66°15 112°59	Town kimberlite pipe	Yakutia (Sakha)—headwaters of Markha River	Diamond, celestine
Ukraine	Украина		Republic (former S.S.R.)	SW of Russia	
Ulutau	Улутау		Hills	N and W of Dzhezkazgan	
Unzaina—see Kerch					
Ural	Урал		Mountains	Between Europe and Asia	
Urul'ga	Урульга	51°42 116°12	Town deposit	Chitinskaya Oblast' 40 km SW of Nerchinsk	Topaz, beryl, elbaite
Ust'-Kamenogorsk (see also Oskemen)	Усть-Каменогорск	50°00 82°40	City, mine (#2)	East Kazakhstan Oblast'	Creedite, quartz, pyrite
Uzbekistan (both NGS and Cyrillic spelling)	Узбекистан		Republic (former S.S.R.)	Central Asia	
Vatikha	Ватиха		Deposit	Yekaterinburg Oblast' just SE of Murzinka	Amethyst

English	*Cyrillic*	*Lat / Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Verkne Pulonskoe	Верхне Пулонское	66°20 33°00	Lake	Northern Karelia	(See Khit-ostrov)
Veshnevogorsk—see Vishnevogorsk					
Vilyuy	Вилюй		River	Yakutsk A.S.S.R. Lena tributary Central Siberia	(See Chernyshevskiy)
Vishnevogorsk—includes Veins #5, #140	Вишневогорск	55°59 60°33	City deposit	Chelyabinsk Oblast' Southern Ural Mountains	Calcite, pyrochlore, allanite, zircon, aeschynite, brookite, bastnäsite, anatase, chevkinite
Vishnevy—see Vishnevogorsk					
Vitim	Витим	59°28 112°34	River Town	Irkutskaya Oblast' S. tributary to Upper Lena At confluence	
Vitjim—see Vitim					
Viznyavogorsk—see Vishnevogorsk					
Volchiy	Волчий		Mine	Tenkergin	Scheelite, quartz, cassiterite
Volodarsk-Volynskiy	Володарск-Волынский	50°38 28°21	Town, mines	Zhitomir Oblast' approx 40 km north of Zhitomir	Beryl, fluorite, goethite, phenakite, quartz, topaz
Vuoriyarvi	Вуориярви		Massif	Murmansk Oblast' 80 km S of Kovdor	*Natrofairchildite, monticellite, shortite, *belkovite, *komkovite, burbankite, nordstrandite
Wattika—see Vatikha					
Western Kazakhstan Oblast' (Zapadno-Kazakhstanskaya)	Западно-Казахстанская Область		Oblast'	Westernmost Oblast' in Kazakhstan, N and E shores of Caspian Sea	
White Sea	Белое Море			Inlet of Barents Sea	
Wilui, Wiluy—see Vilyuy					
Wolodarsk-Wolynski, Wolodarsk-Wolynsky—see Volodarsk-Volynskiy					
Woltschi, Woltski—see Volchiy					
Yablonovyy Range	Яблоновый Хребет		Long, low mountain range	Chitinskaya Oblast' See also Malkhanskiy Mountains	Aquamarine, tourmaline (See also Malkhanskiy)
Yakutia—see Yakutsk					
Yakutsk (now **Sakha**)	Якутск, Якутская	62°00 129°40	Town, A.S.S.R.	Lower Lena Valley North Central Siberia	
Yavokskoe Mine (or **Yavokskiy**?)			Mine	Ukraine, at Novoya Vorovsk	Calcite, sulfur
Yekaterinburg (ex-Sverdlovsk)	Екатеринбург	56°52 60°35	City, Oblast'	Central Urals	
Yemel'dzhak	Эмельджак	58°36 126°53	Settlement, deposit	Aldan district	Spinel, diopside, titanite, pargasite
Yenisey	Енисей		Giant river	Drains central Siberia, Mongolia to Arctic Ocean	

English	*Cyrillic*	*Lat/ Long*	*Location Type*	*Higher Order Location*	*Mineral Species*
Yeniseyskiy Kryazh	Енисейский Кряж		Ridge	Krasnoyarskiy Kray, east bank of Yenisey, above and below Angara junction	
Yeremeevskaya pit	Еремеевская Копь		"Pit"	Chelyabinskaya Oblast', 20 km N of Zlatoust	Perovskite, clinochlore, diopside, titanite
Yevenkiyskiy Nats. Okrug (=**Evenkiyskiy National' nyy Okrug**)	Эвенкийский Национальный Округ		National Okrug	North central Siberia drained by the Nizhniy Tunguska River	
Yubileynaya (Jubilee)	Юбилейная		Pegmatite	On Karnasurt Mountain	*Bornemanite, eudialyte, *ilmajokite, *laplandite, *lovdarite, *penkvilksite, *raite, *sazhinite, serandite, steenstrupine, *zorite (See also Karnasurt)
Yukspor	Юкспор	68°10 32°24	Mountain	S. Central Khibiny massif	*Canasite, *fenaksite, *khibinskite, *natrophosphate, shcherbakovite, *yuksporite
Yuzhno Kazakhstanskaya Oblast'—see South Kazakhstan					
Zabituy	Забитуй	53°18 102°52	Town	Irkutskaya Oblast	Topaz
Zabytoe—see Zabituy					
Zelenzovskaya Mine			Mine	Chelyabinsk Oblast', near Zlatoust	Perovskite
Zelenzowskaja—see Zelenzovskaya					
Zezqazghan, Zhezkazgan—see Zhezqazghan or Dzhezkazgan					
Zheleznogorsk— essentially the same as Korshunikha		56°30 104°10 56°34 104°08	Village	Irkutskaya Oblast'	Hematite crystals
Zhezqazghan—transliteration of Turkic form of Dzhezkazgan					
Zhitomir (customary name) Zhytomyr (official Ukranian name)	Житомир	50°18 28°40	City, Oblast'	North Central Ukraine	(See Volodarsk)
Zitomir, Zitomersja—see Zhitomir					
Zlato Ust Belovskiy			Mine	Dzhezkazgan	Malachite
Zlatoust	Златоуст	55°10 59°38	City	Chelyabinsk Oblast' Southern Urals	Perovskite (See also Akhmatovskaya, Yeremeevskaya, Zelenzovskaya)

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Alumino-Fluorides from the Morefield Pegmatite

Amelia County, Virginia

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An assemblage of rare alumino-fluoride minerals has been found in the Morefield pegmatite, Amelia County, Virginia. The suite includes prosopite, cryolite, chiolite, thomsenolite, pachnolite, ralstonite and purple elpasolite.

INTRODUCTION

The pegmatite masses and surrounding rocks of the Amelia district have produced over 100 different mineral species (Dietrich, 1990) and have been described in the mineralogical literature (Glass, 1935; Kearns, 1993b). Minerals include commercial gem stock (amazonite, topaz, spessartine, moonstone), rare-earth minerals (microlite, monazite, columbite-tantalite), commercial quantities of sheet, punch and scrap mica, and alumino-fluorides.

The Morefield pegmatite was discovered by Silas V. Morefield in 1929, and has had an extensive and varied history of ownership and mining activity (Lemke *et al.*, 1952; Brown, 1962; Sweet and Penick 1986; Kearns, 1993b). The Morefield mine is presently owned and operated by the Powhatan Mining Company as a commercial gem mine. Collecting on the 80-acre tract of land around the pegmatite is open to the public on a fee basis. It is one of only two complex and extensively mineralized pegmatites known in the area, the other being the Rutherford pegmatite.

In 1988 development of a new vertical shaft was begun 40 meters northeast of the main shaft. The drift at the 60-foot level (erroneously referred to in previous literature as the "45-foot" level) was simultaneously developed along the pegmatite strike toward the northeast. In July of 1991 the first known aluminum fluoride mineralization was encountered in the northeast adit approximately 38 meters from the main shaft. This first occurrence was a single irregular-shaped mass of prosopite (Kearns, 1992). In February of 1992, extensive aluminum fluoride mineralization was again encountered in the new shaft just above the intersection with the 60-foot level. A core of sugary, bright purple elpasolite with minor chiolite was found in a mass of brown, translucent cryolite and lavender-gray prosopite. The new shaft intersected the 60-foot drift in April of 1992. In August of that year a single pocket measuring 15 by 28 cm was encountered on the working face (hanging wall), 8 meters northeast of its intersection with the new shaft. The open pocket was surrounded by a mass of translucent brown cryolite which was in turn surrounded by a narrow rim of pale lavender prosopite. The pocket contained many well-formed microcrystals of chiolite, elpasolite, thomsenolite, pachnolite and ralstonite.

The Morefield pegmatite is the second known occurrence of alumino-fluoride minerals in North America (the first for chiolite). A similar mineral assemblage has been reported from the aluminum fluoride pegmatites at St. Peter's Dome, El Paso County, Colorado. Farther afield, these minerals are also present in the cryolite deposits of Ivigtut, Greenland (Petersen and Secher, 1993) and at Miass (Miask) in the Ural

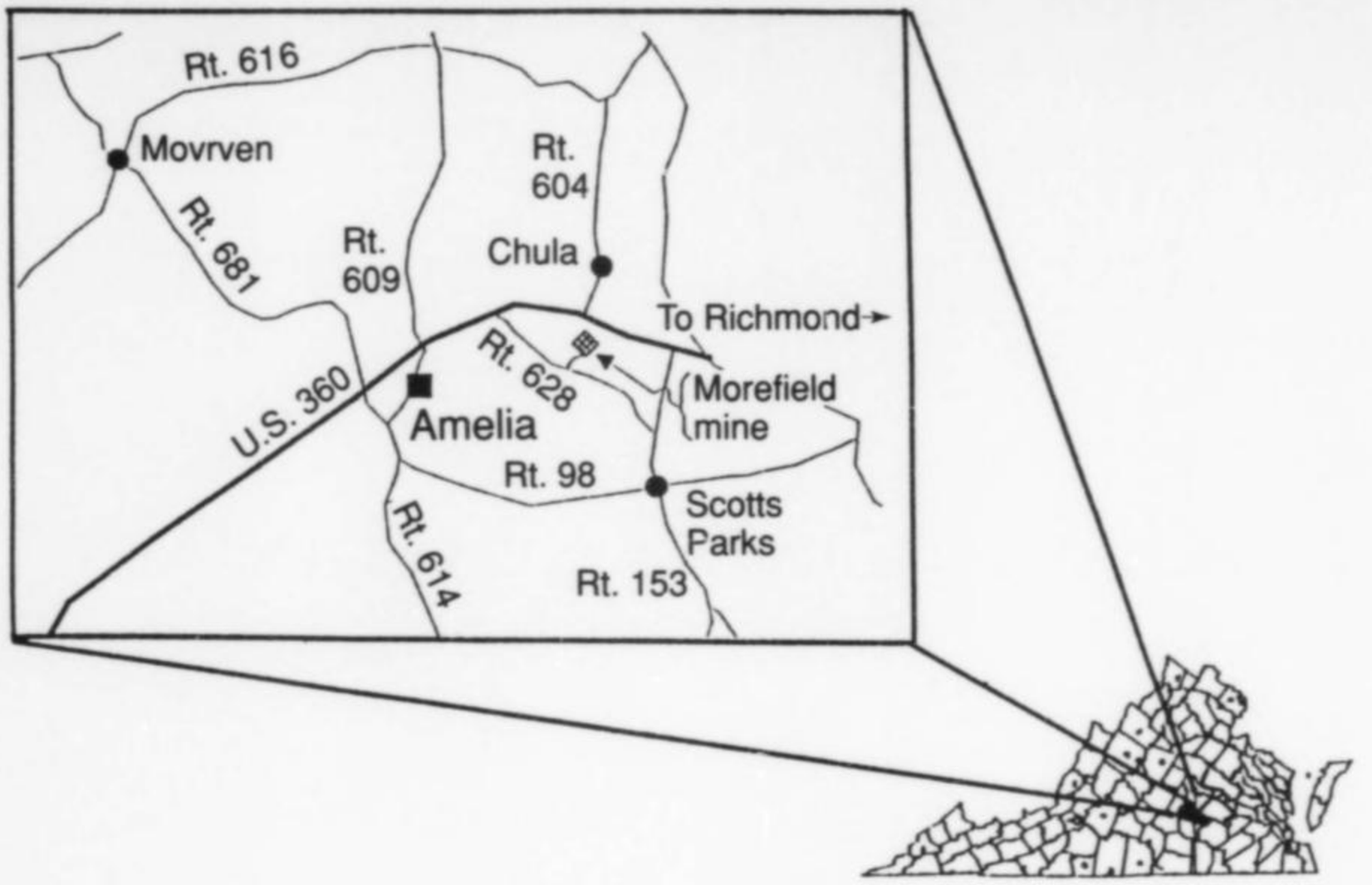


Figure 1. **Location map of the Morefield mine, Amelia, Virginia.**

Mountains of Russia (Palache *et al.*, 1951). A similar suite of alumino-fluoride minerals was recently discovered at Katugine, Yakutsk, Russia. Over 100 mineral species have been found in what may be the world's largest known deposit of niobium and aluminum fluoride (mostly cryolite) minerals. High concentrations of tantalum, zircon, gagarinite and RE(Y)-fluorite are also reported. This new locality is located in the Kalar administrative region which is 70 km north of the Novajia Chara station on the Daikal-Amur railway (personal communication, 1994, from A. A. Godovikov, Fersman Mineralogical Museum, Moscow).

MINERALOGY

The Morefield pegmatite is markedly zoned and extensively mineralized by late-stage pegmatitic fluids. Primary aluminum fluoride minerals of the pegmatite are topaz and cryolite. Remnants of milky white topaz crystals measuring several inches across are abundant in the zoned portion of the pegmatite. Clear gemmy crystals are also present. Topaz and cryolite readily alter to other aluminum fluorides. The paragenetic sequence of secondary aluminum fluorides observed in the pocket is: cryolite to elpasolite and chiolite, followed by thomsenolite, pachnolite and finally ralstonite. Cryolite also alters to prosopite.

Mineral species were identified using a Philips Automated Powder Diffraction System with APD1700 (version 3.5C) software. Mineral composition was verified by semiquantitative EDAX analysis. X-ray diffraction data (*d*-spacing and peak intensity) were determined using the averaged values from four diffraction patterns. Patterns were obtained using CuK_α radiation with a graphite-crystal monochromator, and a 2θ step scan speed of 0.015 deg./min. Unit cell dimensions were determined using least square refinement of the averaged patterns.

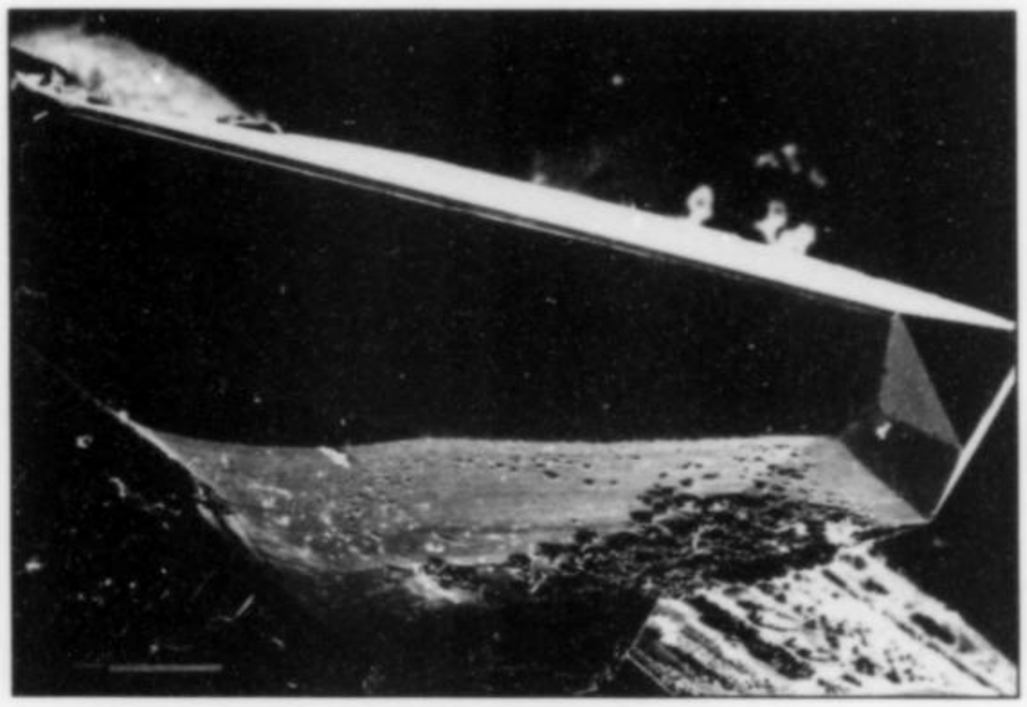


Figure 2. **Twinned (011) chiolite crystal, 0.126 mm, showing well-developed re-entrant angle. SEM photo.**

Chiolite $Na_5Al_3F_{14}$

Chiolite occurs as well-formed, water-clear crystals in solution cavities in massive cryolite. The crystals are twinned (011), and display prominent re-entrant angles. Chiolite twins from the Morefield pegmatite are different in appearance from others previously described for this species. The

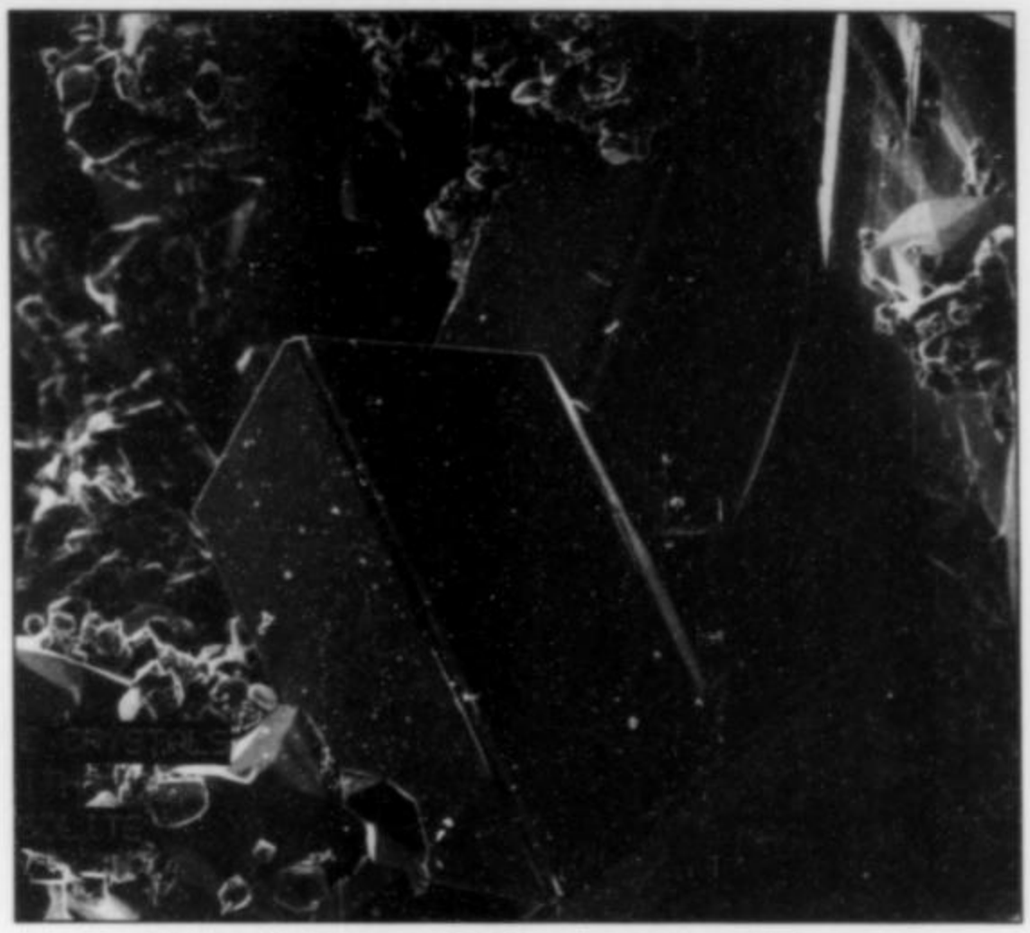


Figure 3. **Larger chiolite crystals to 0.4 mm (twinned) with smaller elpasolite and ralstonite crystals. SEM photo.**

Figure 4. **Clear crystal of chiolite (twinned). Crystal is approximately 1 mm long. Photomicrograph by Paul Smith.**

crystals of chiolite are the most common and the largest (up to 3 mm) of the secondary alumino-fluorides found in the cryolite cavities.

Chiolite has been reported from Ivigtut, Greenland, as irregularly bounded grains up to 10 cm (Petersen and Secher, 1993) in cryolite. It is also found associated with thomsenolite, topaz, phenakite, cryolithionite and fluorite (Palache *et al.*, 1951) in a cryolite pegmatite at Miass in the Ural Mountains of Russia. The Morefield mine is the first reported occurrence of chiolite in North America.

X-ray diffraction data agree well with the published data from Jacoboni *et al.* (1981).

Cryolite Na_3AlF_6

Cryolite is the second most abundant alumino-fluoride mineral found in the Morefield pegmatite. It occurs as dark gray to brown, translucent masses, and is generally surrounded by prosopite. Cavities within the cryolite masses have provided well-formed microcrystals of additional secondary alumino-fluoride species, however, euhedral crystals of cryolite have not been found at the Morefield mine.

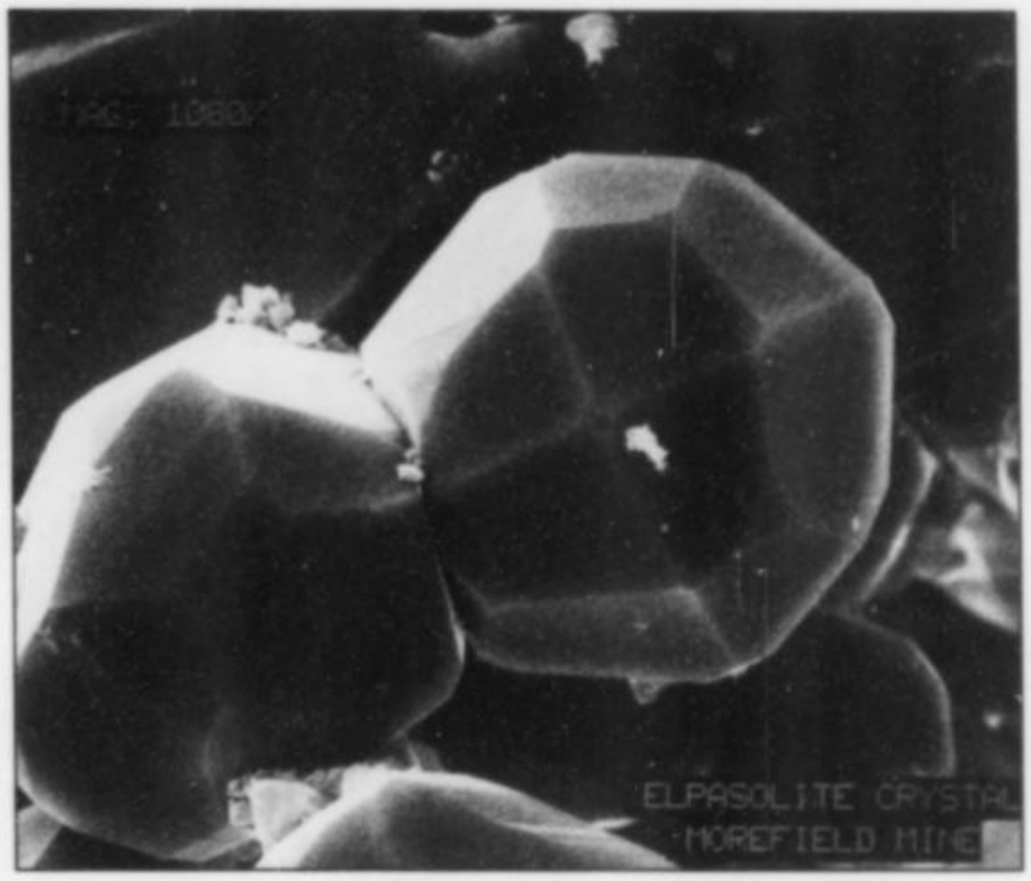


Figure 5. **Elpasolite crystals to 0.05 mm showing {111}, {100} and {511} modifications to the trapezohedron {211}. SEM photo.**

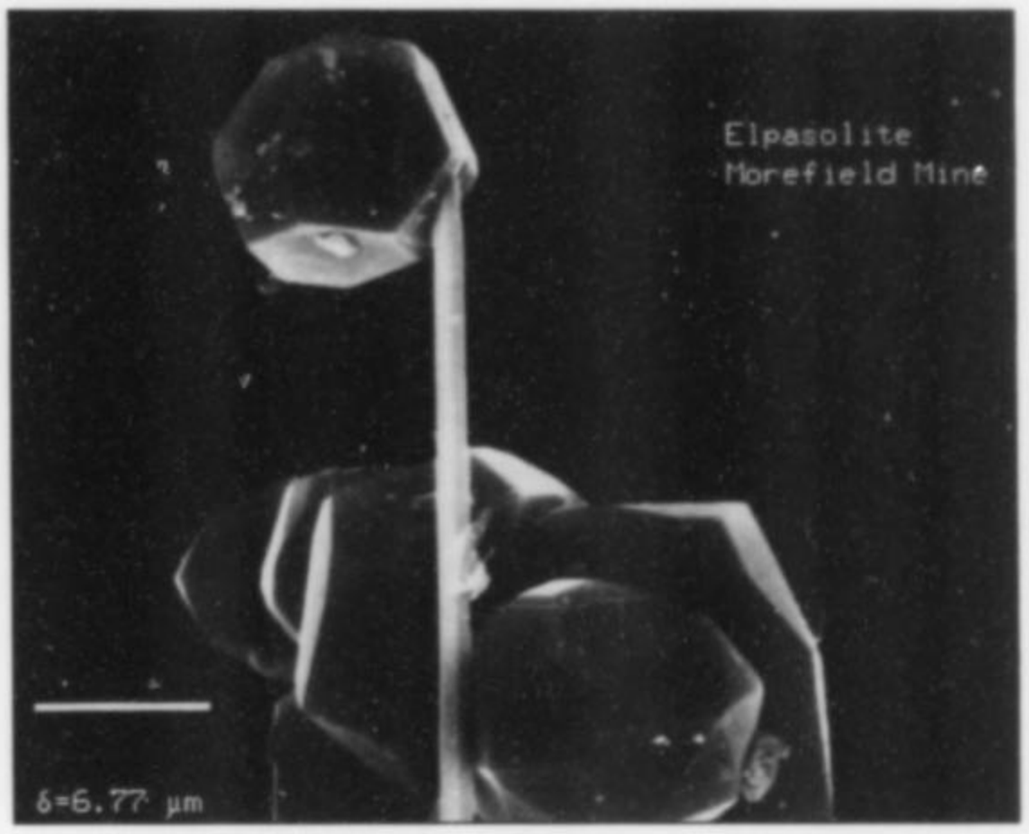


Figure 6. **Small elpasolite crystal, .007 mm, impaled on rutile needle. SEM photo.**

Elpasolite K_2NaAlF_6

Elpasolite was first identified at the Morefield mine as a bright purple, granular mass (Kearns, 1993a) intergrown with minor chiolite and surrounded by cryolite and prosopite. Purple elpasolite has not been reported from any other locality. A spectrographic analysis of 35 trace elements provided by the U.S. Geological Survey in Denver indicates that the color is not the result of impurities.* It probably

* Elements detected were: Ca 0.7%, Mg 0.2%, Na 5.0%, Ba 500 ppm, Mn < 10 ppm, Sr 500 ppm, and V < 10 ppm.

results from color centers similar to those responsible for color in fluorite. Vacancies within the structure, typically the result of radiation, leave holes in which electrons become trapped by the surrounding cations. Energy transitions of these electrons involve the absorption of specific wavelengths of visible light, giving rise to color (Nassau, 1983).

Elpasolite crystals are most commonly observed forming "sugary" masses of tiny, colorless trapezohedrons associated with chiolite crystals. The trapezohedrons are usually distorted and may show modifications by the cube {100}, octahedron {111} and a second trapezohedron {511}.

Elpasolite was first described by Cross and Hillebrand (1883). It is named for the type locality at St. Peter's Dome, El Paso County, Colorado, where microcrystalline aggregates are found sparingly with pachnolite, cryolite, prosopite, thomsenolite and gearksutite in aluminum fluoride pegmatites. The Morefield elpasolite is associated with prosopite, cryolite, chiolite, thomsenolite, pachnolite and ralstonite. Gearksutite has not been identified.

Other occurrences of elpasolite have been reported from the Cetine antimony mine in Tuscany, Italy (Sabelli, 1987), where it is found sparingly with ralstonite, and from the aluminum fluoride pegmatites of Ivigtut, Greenland (Petersen and Secher, 1993). The Morefield mine in Amelia County, Virginia represents the fourth reported world occurrence of this mineral.

A comparison of the averaged diffraction data for Morefield elpasolite with those of type specimens (St. Peter's Dome, Colorado) determined by Frondel (1948), synthetic material by the National Bureau of Standards (1971), and specimens from the Cetine mine, Tuscany, Italy (Sabelli, 1987) shows good agreement.

Prosopite $CaAl_2(F,OH)_8$

Prosopite is the most abundant alumino-fluoride mineral at the Morefield mine. It is found as irregular masses up to several feet across, ranging in color from gray-white to lavender-gray. Prosopite also appears to replace large euhedral topaz crystals, and is often associated with dark green fluorite and "gummy" white masses of kaolinite (Kearns, 1992). Alteration of topaz to prosopite, fluorite and kaolinite is reported from topaz-rich greissens in Altenberg, Saxony and Schleggenwald, Bohemia (Palache *et al.*, 1951). Nearly all masses of cryolite from the Morefield pegmatite are completely surrounded by a zone of prosopite. This suggests that prosopite is also derived from the alteration of cryolite. Prosopite is reported as powdery masses resulting from the alteration of a topaz-bearing porphyry in Tasmania; in the U.S. it is found with fluorite, quartz and pyrite in Utah, and as large unaltered masses in cryolite-bearing pegmatites of St. Peter's Dome, El Paso County, Colorado. Recently, numerous crystals of prosopite have been found in the cryolite stock of Ivigtut, Greenland (Petersen and Secher, 1993).

Ralstonite $Na_xMg_xAl_{2-x}(F,OH)_6 \cdot H_2O$

Crystals of ralstonite from the Morefield pegmatite are white and translucent. They occur as simple octahedrons {111}, octahedrons with cube {100} modifications, and as cubes with minor octahedral {111} faces. When both cube and octahedron faces are present, the {100} faces characteristically show development of growth hillocks. Ralstonite is the last mineral to form in the alumino-fluoride paragenesis.

Ralstonite, unlike the other alumino-fluorides, has a variable composition. Chemical variation creates variation in unit cell parameters, crystal habit and other physical properties (i.e., index of refraction and specific gravity). Pauly (1965) lists the chemistry of two ralstonite crystals from

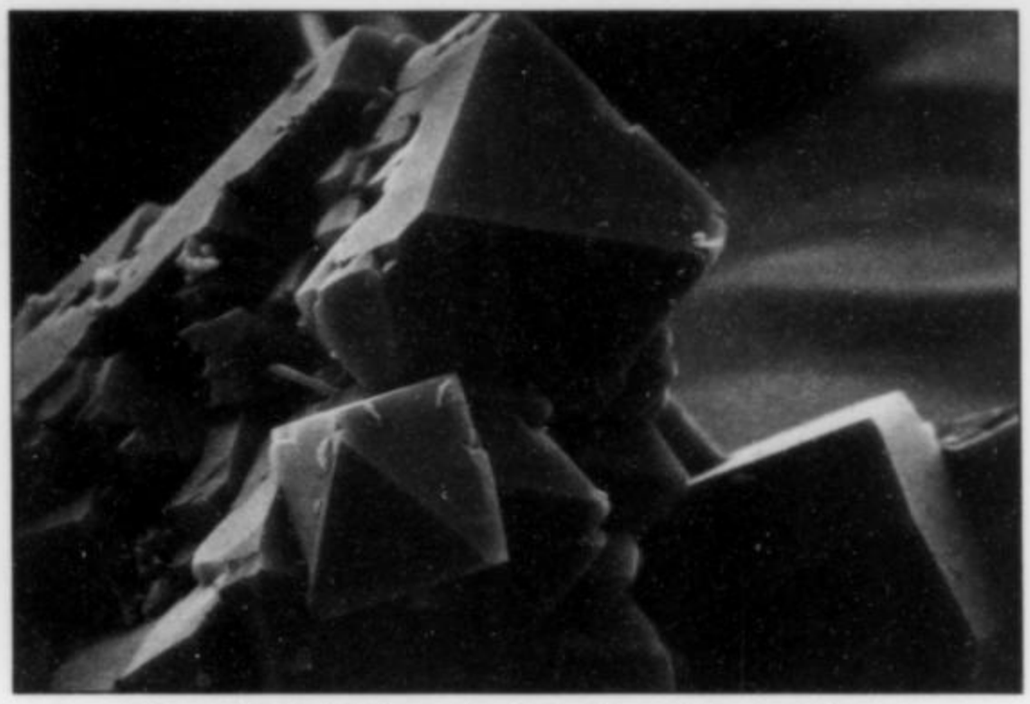


Figure 7. **Typical octahedral ralstonite crystals to 0.04 mm with thomsenolite (lower right) crystal. SEM photo.**

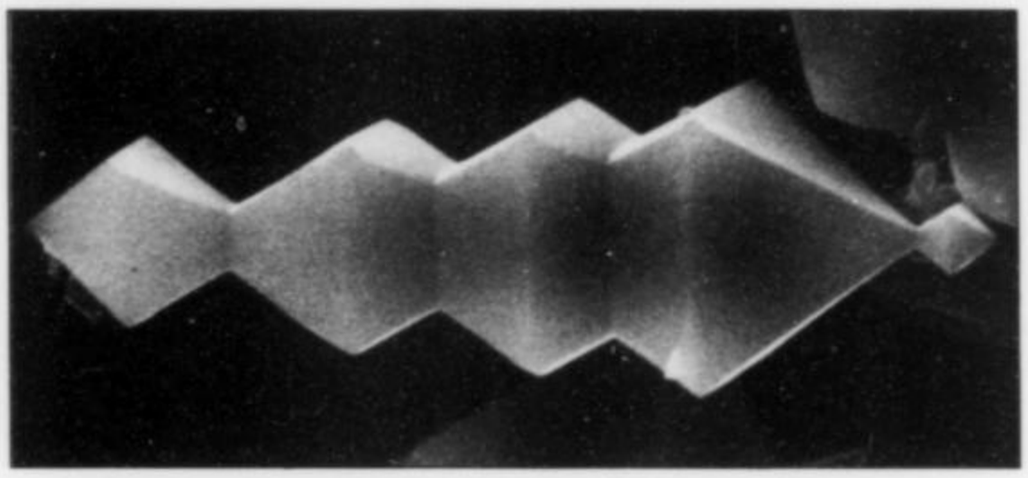


Figure 8. **Ralstonite crystals 0.02 mm showing serial growth with alignment of the tetrad axes. SEM photo.**

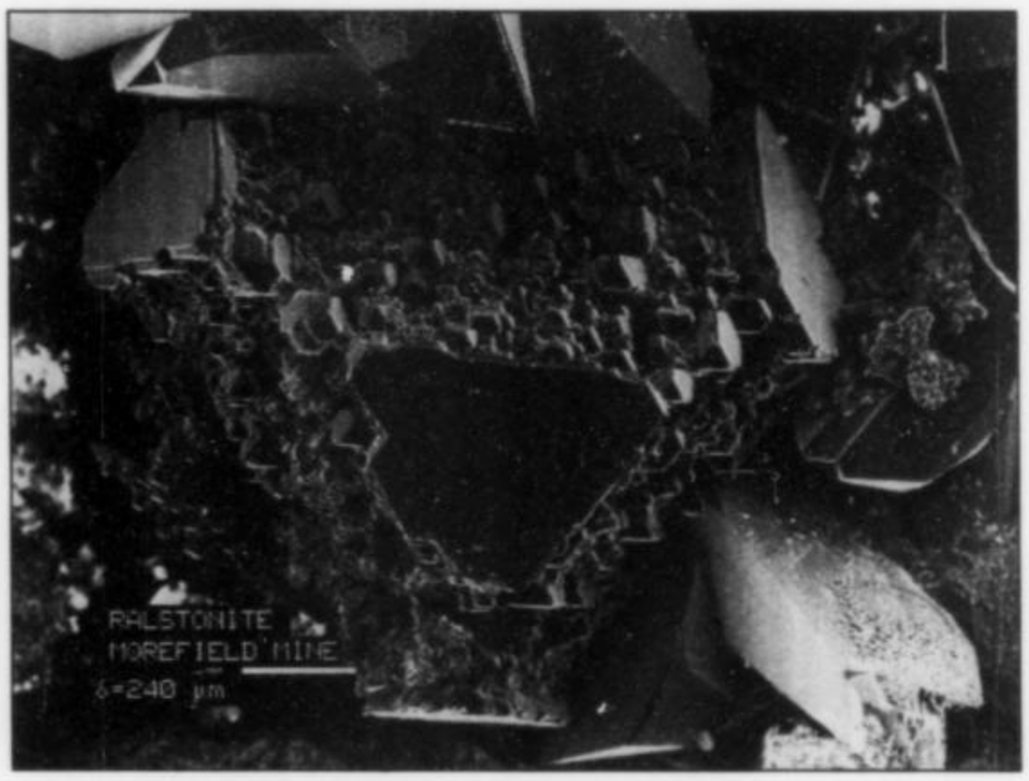


Figure 9. **Ralstonite crystal, 1.6 mm, with cube {100} and octahedron {111} forms. Growth hillocks are well-developed on the cubic faces. SEM photo.**

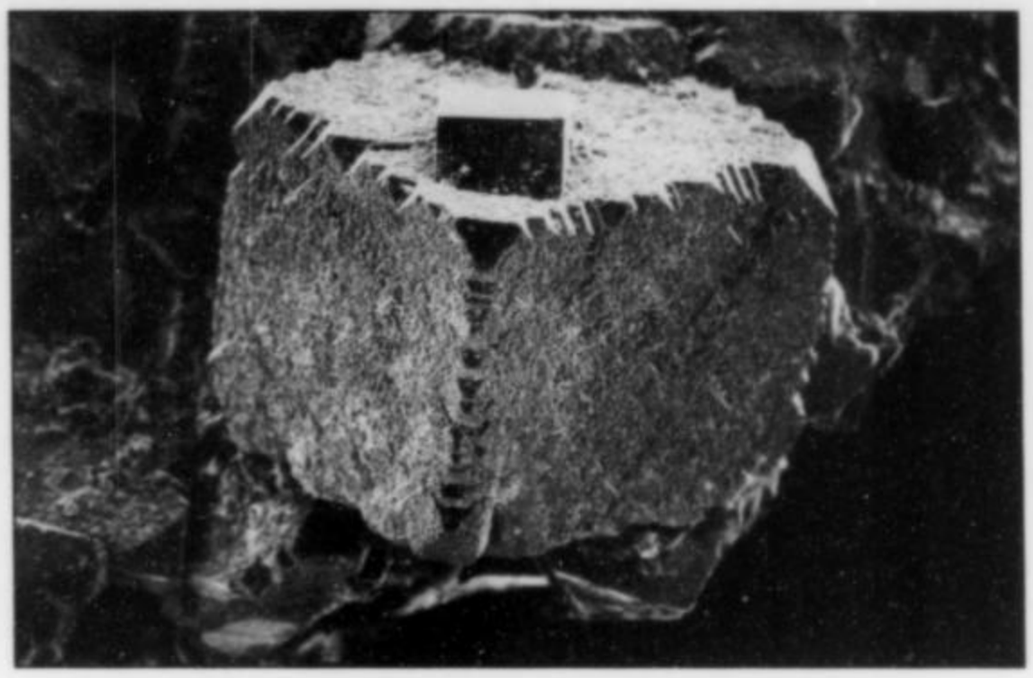


Figure 10. **Cubic-dominated ralstonite crystal. SEM photo.**

Ivigtut, Greenland, with $x = 0.88$ and $x = 0.34$ (see chemical formula above). Unit cell parameters were determined to be $a = 10.012$ and 9.93 Å respectively. Ralstonite compositions with greater x-values typically display crystals dominated by the cubic habit. Lower x-values are associated with octahedrally dominated forms (Pauly, 1965). X-ray diffraction data for Morefield ralstonite correllate reasonably well (though not precisely, for reasons of chemical variation) with previously published data.

Cross and Hillebrand (1883) reported ralstonite with elpasolite from the aluminum fluoride pegmatites at St. Peter's Dome, Colorado. Pauly (1965) references the occurrence of ralstonite from aluminum fluoride pegmatites at Ivigtut, Greenland, from fumarole deposits around Mt. Vesuvius, Italy and similar deposits in Kamtchatka, and from the Ilmen Mountains of Russia and Kazakhstan.

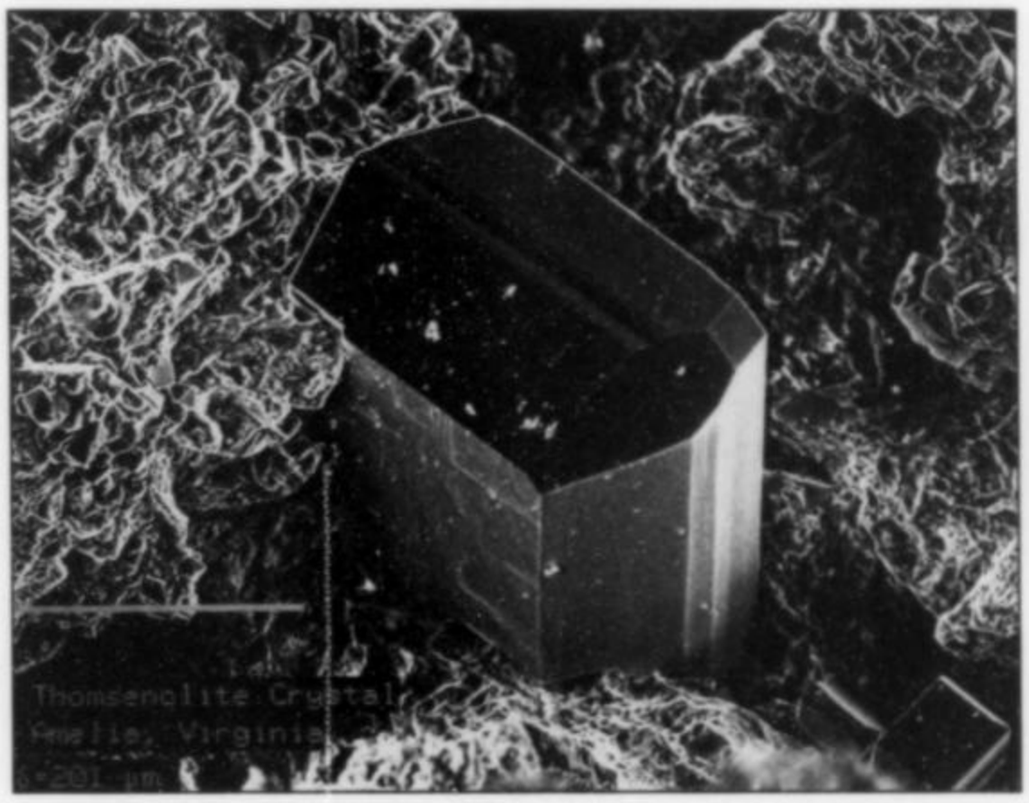


Figure 11. **Well-formed crystal of thomsenolite, 0.4 mm, surrounded by a mass of small ralstonite crystals. SEM photo.**

Thomsenolite/Pachnolite $NaCaAlF_6 \cdot H_2O$

Thomsenolite and pachnolite are dimorphous forms which generally occur together in cryolite solution cavities. Thomsenolite is relatively common, while pachnolite is the rarest

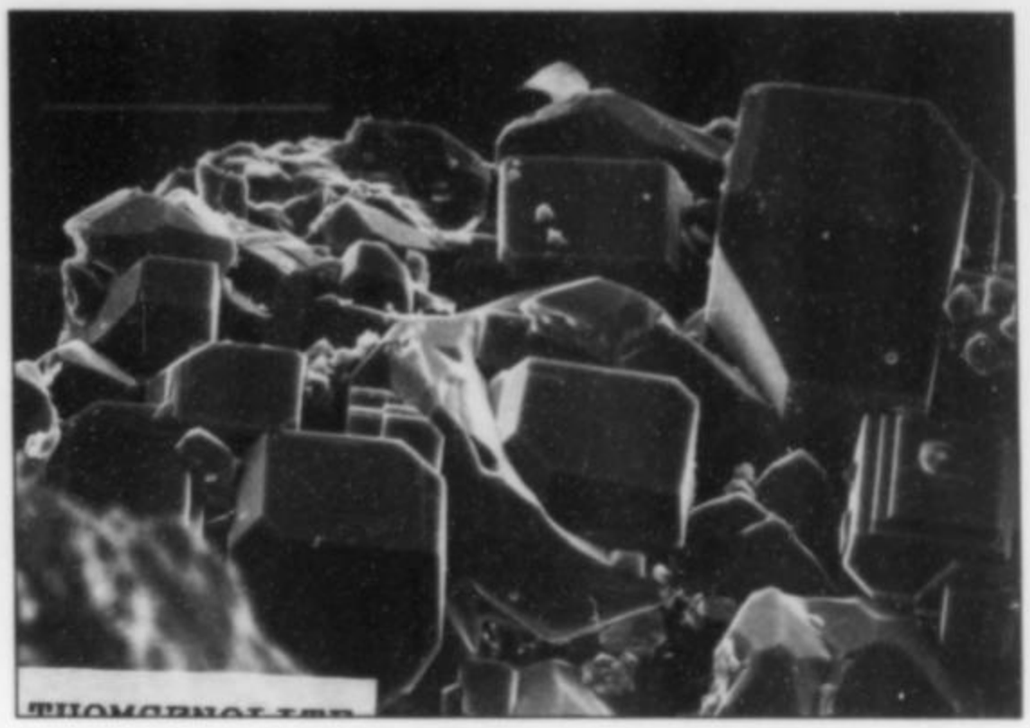


Figure 12. **Thomsenolite crystals to 0.16 mm exhibiting parallel orientation and unequal development of (111) face.**

species in the Morefield mine's alumino-fluoride assemblage. Only a few small specimens of pachnolite have been found.

Optical determinations were used to verify the identity of these two closely related species. Pachnolite is biaxial positive with $2V = 76°$, and thomsenolite is biaxial negative with $2V = 50°$. A detailed description of the crystal morphology of these two species is given by Ferguson (1946).

Thomsenolite is clear, colorless, and characteristically forms aggregates of blocky crystals in parallel orientation. Thomsenolite crystals are dominated by well-developed {001} and {111} forms, and are bounded by a stubby {110} prism. One of the {111} faces is characteristically overdeveloped with respect to the others of the same form. Other commonly expressed forms are {331} and {100}.

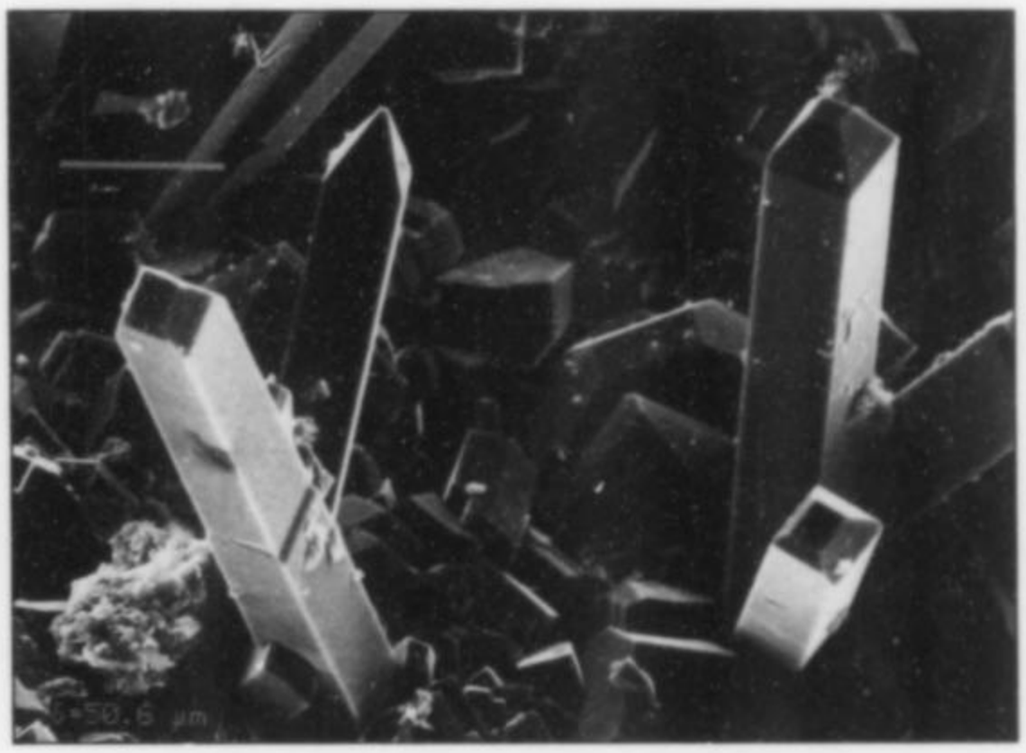


Figure 13. **Prismatic crystals of pachnolite to 0.17 mm with blocky crystals of thomsenolite at the base. SEM photo.**

Pachnolite occurs as long prismatic crystals growing on thomsenolite in a non-parallel orientation. Free-standing crystals of pachnolite are characteristically bounded by the {110} and {111} forms, and are frequently, but not always, terminated by the {001} pinacoid.

RECENT WORK

Extensive work has been done at the Morefield mine since it was reopened in 1985 by William and Joan Baltzley, under the name of the Powhatan Mining Company. The extension of the 60-foot adit to the northeast and the sinking of the new shaft have nearly doubled the extent of accessible mine passages and mineral exposure. During the summer and fall of 1993 the original Morefield shaft was completely retimbered, and now the 60-foot level is being extended toward the southwest. The tireless efforts of the Baltzleys to develop and preserve this exceptional gem mine, and to make mineralogical research opportunities available, will no doubt bring to light many new and exciting discoveries in the future. The mineralogical community owes a debt of gratitude to Mr. and Mrs. Baltzley for their work, knowledge and commitment to the Morefield pegmatite.

ACKNOWLEDGMENTS

I would like to thank Ms. Cynthia Evaniak for her careful proofreading of this manuscript, and her many suggestions which improved the quality of this project. Thank you to Dr. Steven Wright, Department of Geology and Geography, James Madison University, for providing the location map. I would also like to thank the James Madison University Scanning Electron Microscope Center for providing access to the SEM and EDAX facility. Tim Hopkins of the U.S. Geological Survey's Denver Laboratory performed the spectrographic analysis of the purple elpasolite, for which I am also grateful.

BIBLIOGRAPHY

BROWN, W. R. (1962) Mica and feldspar deposits of Virginia. *Virginia Division of Mineral Resources mineral resources report no.* **3**.

COWLEY, J. M., and SCOTT, T. R. (1948) Basic fluorides of aluminum. *Journal of the American Chemical Society*, **70**, 105.

CROSS, W., and HILLEBRAND, W. F. (1883) On minerals of the cryolite group recently found in Colorado. *American Journal of Science,* **26**, 271.

DIETRICH, R. V. (1990) *Minerals of Virginia*. Virginia Division of Mineral Resources, Charlottesville.

FERGUSON, R. B. (1949) Observations on some aluminum fluoride minerals. *American Mineralogist,* **34**, 393–395.

FERGUSON, R. B. (1946) On the crystallography of thomsenolite and pachnolite. *Transactions of the Royal Society of Canada*, **40**, 1–25.

FRONDEL, C. (1948) New data on elpasolite and hagemannite. *American Mineralogist,* **33**, 84–87.

GLASS, J. J. (1935) The pegmatite minerals from near Amelia, Virginia. *American Mineralogist*, **20**, 741–768.

JACOBONI, C., LEBLE, A., and ROUSSEAU, J. J. (1981) Determination precise de la structure de la chiolite $Na_5Al_3F_{14}$ et etude par R.P.E. de $Na_5Al_3F_{14}:Cr^{3+}$. *Journal of Solid State Chemistry,* **36**, 297–304.

KEARNS, L. E. (1992) Prosopite from the Morefield mine, Amelia County, Virginia. *Virginia Minerals,* **38**, 14–15 (quarterly publication of Division of Mineral Resources, Charlottesville).

KEARNS, L. E. (1993a) Alumino-fluoride minerals from the Morefield mine. *Virginia Minerals*, **39**, 15 (a quarterly publication of the Division of Mineral Resources, Charlottesville).

KEARNS, L. E. (1993b) Minerals of the Morefield pegmatite, Amelia County, Virginia. *Rocks and Minerals*, **68**, 232–242.

LEMKE, R. W., JAHNS, R. H., and GRIFFITTS, W. R. (1952) Mica deposits of the Southeastern Piedmont, pt. 2, Amelia district, Virginia. U.S. Geological Survey Professional Paper **248-B**.

MORSS, L. R. (1974) Crystal structure of dipotassium sodium fluoroaluminate (elpasolite). *Journal Inorganic Nuclear Chemistry,* **36**, 3876–3878.

NASSAU, K. (1983) *The Physics and Chemistry of Color: The Fifteen Causes of Color.* John Wiley and Sons, New York, 454 p.

NATIONAL BUREAU OF STANDARDS (1971) Monograph 25, Sec. 9, 43.

PALACHE, C., BERMAN, H., and FRONDEL, C. (1951) *The System of Mineralogy.* 7th edition, vol. 2, John Wiley and Sons, New York.

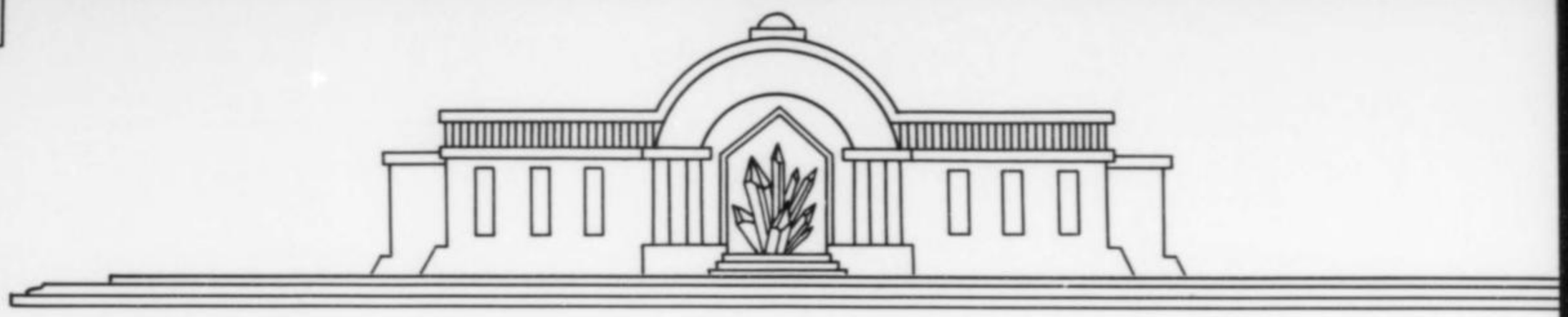
PAULY, H. (1965) Ralstonite from Ivigtut, South Greenland. *American Mineralogist,* **50**, 1851–1864.

PETERSEN, O. V., and SECHER, K. (1993) The Minerals of Greenland. *Mineralogical Record,* **24**, 1–88.

SABELLI, C. (1987) Structure refinement of elpasolite from the Cetine mine, Tuscany, Italy. *Neues Jahrbuch für Mineralogie Monatshefte,* **11**, 481–487.

SABELLI, C., and BRIZZI, G. (1984) Alteration minerals of the Cetine mine, Tuscany, Italy. *Mineralogical Record*, **15**, 27–36.

SWEET, P. C., and PENICK, D. A., Jr. (1986) Morefield pegmatite mine reopens—Virginia's only active underground gem mine. *Virginia Minerals*, **32**, 13–18 (quarterly publication of the Division of Mineral Resources, Charlottesville).



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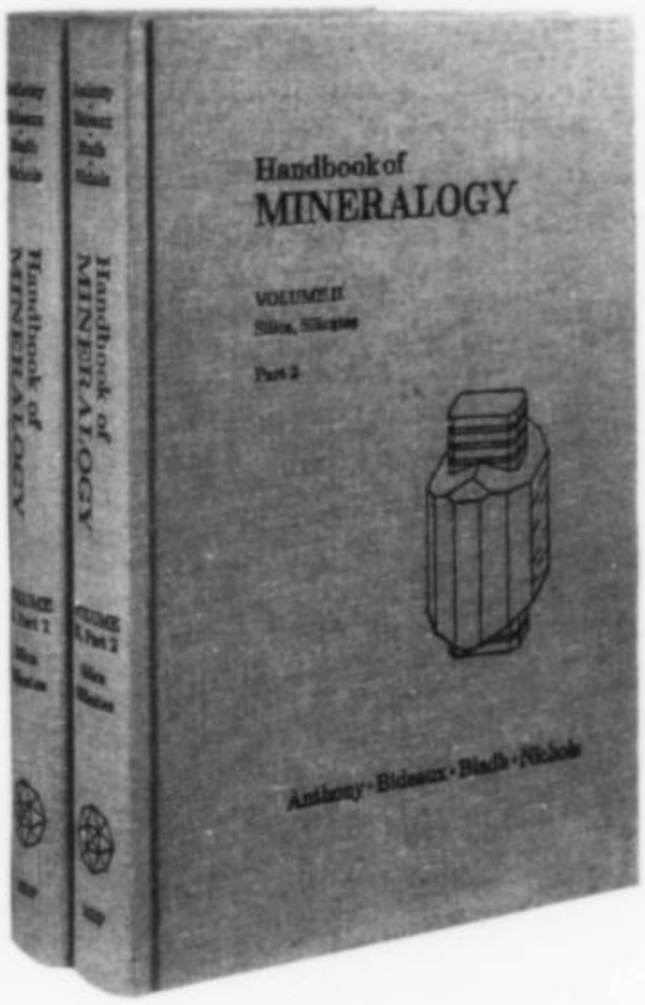

Handbook of Mineralogy

Volume II (in two books: Silicia, Silicates; by John W. Anthony, Richard A. Bideaux, Kenneth W. Bladh, and Monte C. Nichols. Published (1995) by Mineral Data Publishing, P.O. Box 37072, Tucson, Arizona 85740. Hardcover, buckram, without dustcovers, 18 x 26 cm, 904 plus xiv pages, ISBN 0-9622097-1-6, $135 plus $7.50 shipping and handling.

The *Handbook of Mineralogy,* continued with this publication of the silicates in two books (together comprising Volume II) is a most welcome and exciting addition to the bookshelf. It provides a very up-to-date reference work for all silicate minerals, including publications in the international literature through 1992, and publications in the *American Mineralogist* through 1994, for both full descriptions and abstracts.

Those who have been using the first volume* of the *Handbook of Mineralogy* for the last 4–5 years will slip seamlessly into using Volume II. The style is the same, with all silicate species listed alphabetically, one per page, and the critical data for each species neatly and consistently summarized. All of the high-quality characteristics of Volume I (see review in *Mineralogical Record,* **22**, 59–60) are repeated in Volume II. This is the "Dana" for the next few generations.

The two parts of Volume II are consecutively paginated. Part 1 contains the species *absuurmbachite* through *lamprophyllite,* and Part 2 contains the species *långbanite* through *zussmanite.* The special complexities of amphibole nomenclature are explained in a 5-page prefatory section, and the introduction is well written and informative.

In addition to the great care evident in the preparation of the content of this book, the publishing aspects also received much attention. As with Volume I, every aspect of this work is very well done; it is superb! For the serious collector and mineralogist, this volume is a "must have" acquisition.

Pete J. Dunn
Smithsonian Institution

* Volume I, on elements, sulfides, and sulfosalts, has been reprinted and is available for $90 and $6 shipping and handling; ISBN 0-9622097-8.

Bergmännische Geduldflaschen

by Otto Fitz and Peter Huber. Published (1995) by the Österreichisches Museum für Volkskunde, Laudongasse 15-19, A-1080 Vienna, Austria; softcover, 17 x 24 cm, 72 pages, with color covers and 8 interior pages of color; ISBN 3-900359-62-8; price 160 Austrian schillings plus shipping.

This little book describes an interesting type of old European mining art called the "patience bottle," the miner's equivalent of the old sailors' ship-in-a-bottle. Eighteenth and 19th-century miners in Germany and the former Austro-Hungarian Empire would sometimes spend their evenings carefully assembling little multi-level mining scenes inside small-necked round or square bottles. The miniature miners, tools, timbers and mine equipment were all meticulously carved and painted, then lowered (along with real ore samples) through the bottleneck with tongs and glued in place.

These are prime mining collectibles, quite rare and expensive even in Germany and Austria.

The book contains a general descriptive chapter (well footnoted), 53 photos, a remarkably long bibliography (over four pages), and a catalog of many known examples giving details of size, construction, region of origin and date.

Yes, it's an esoteric field; but authoritative books on mining collectibles are uncommon, and anyone who enjoys such things will want to have this book.

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MINERAL STORIES

Lawrence A. Conklin

The Taxco Silvers

Jim and Imelda Klein

We had just arrived in the Mexican city of Taxco for our family vacation. We were particularly excited, as we hoped to add some specimens to our fledgling mineral collection. On our first day in the city we wandered into a mineral shop several blocks off of the city center. They had an assortment of miscellaneous sulfide minerals along with calcites and quartz specimens, but nothing of great interest. When we asked if they had any silver minerals the shop owner produced several interesting pieces that looked like pseudomorphs of silver after pyrite and other sulfides. We were rather new to collecting and had little knowledge of silver minerals and occurrences. After the usual haggling and discussion, we spent our entire mineral budget, and came away with several rather expensive pieces. Later in the day we saw similar specimens in other shops (we later found out that the shop owners were members of the same family).

After the purchase our suspicions and doubts began to grow. The specimens were too good to be true. A small scratch applied to the back of one piece revealed the bronze color of pyrite beneath. These were not replacements but rather sulfides coated with a thin layer of silver. Could they be real or were they fakes? Much discussion resulted. In the afternoon we visited a tourist information center and were told that not only were the minerals natural they were the best produced in some time. For some reason we were not much reassured.

That evening we were at the city plaza eating popcorn while our children, Aida and Will, were running around blowing soap bubbles. We struck up a conversation with a young man sitting next to us. He was raised in Taxco, but now lived in Chicago. When asked about Taxco minerals, he said we should visit his uncle, who worked in the mine and collected minerals. A quick phone call and conversation with the uncle's daughter resulted in an appointment to meet with him the following afternoon.

When we arrived at the home of the Mexican miner the next day, we noticed a cabinet bolted to the wall containing numerous specimens. Our hopes rose that we would be able to resolve the question about our silvers. After some polite small talk, we got down to business. He had worked in the mines of Taxco for 25 years, but had never seen anything like these silver specimens. He was reluctant to pronounce them fakes, but said that he would ask the mine geologist to meet with us the next day at noon.

When we met the geologist the following day, he inspected the minerals and confirmed our suspicions that they were fake. He produced a small pyrargyrite crystal from his pocket, and gave us some quick instruction on silver occurrences in Taxco mines. The geologist accompanied us back to the mineral shop, but followed us in pretending that he didn't know us. We asked the shop owner for a refund since we believed the specimens to be fake. He protested that they were natural and became somewhat belligerent. The mine geologist at this point identified himself and took charge. He informed the shop owner that (1) the minerals were fake and that (2) he should refund our money under threat of losing his business license. That resolved the problem, and our traveler's checks were eventually restored to us to our great relief.

We visited the geologist again to express our gratitude for his assistance. We were treated to the famous warm Mexican hospitality and made to feel quite at home. He showed us his pyrargyrite collection, which was quite impressive (and not for sale). A year later when we returned, the pyrargyrites had been sold to a German dealer. Alas, an opportunity lost. We did not return home empty handed, though. He gave us a number of specimens from his collection. More importantly, we gained a very good mineral friend. We now visit Taxco every year and spend much of our time renewing our friendship with this gentleman and his family, and exchanging minerals.

As it turned out, we were not the only ones taken in by the silver fakes (see *Mineralogical Record*, vol. 19, p. 210 and 213). Miguel Romero subsequently warned the collecting community about them (*Mineralogical Record*, vol. 20, p. 405). They are still available in the mineral shops in Taxco.

We returned in 1994 from our fifth visit to Taxco. We now have one display case dedicated to Taxco minerals, many of which have been obtained by trading with our friend. Although not as prolific as other Mexican localities, Taxco currently produces attractive calcites, barites, sulfides and quartz crystals. Mining in a new section of one of the mines offers the promise of producing wire silver. And there is always the hope of more pyrargyrites.

Red Cloud Coincidence

Wally Mann

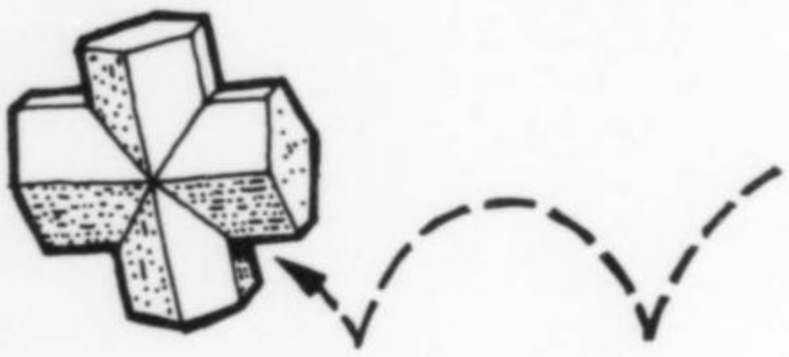
It was the spring of 1981 and I was still daydreaming about the article and color photographs of Red Cloud mine wulfenite shown in the *Mineralogical Record* the previous year (vol. 11, no. 3), so I contacted Betty Roberts of *Roberts Minerals* and asked her to find a Red Cloud wulfenite for me.

At about the same time Rick Rolater was selling a major portion of his fine collection. I asked him if he had a Red Cloud wulfenite for sale and he told me that among the specimens he was selling was a wulfenite miniature that came with an Ed Over provenance. He invited me to come to his house to look at it.

Somehow, I never made it over to Rick's house to see the specimen, but in early summer I received a package from Betty Roberts which contained a Red Cloud wulfenite. It was a complex crystal of the best color and it measured 3.1 cm x 4.1 cm. To say I was excited was a gross understatement. I finally had a great Red Cloud mine wulfenite!

October 1981 was our turn to host the monthly meeting of the MAD group (Mineralogical Association of Dallas). Among the early arrivals were Rick and Cholly Rolater, who went to look at my collection. Rick's first comment was "What are you doing with my Red Cloud wulfenite?" I was shocked, but told him it couldn't he his because I bought it from Betty Roberts. He then told me he had consigned it to Cal Graeber who had obviously sold it to Betty. This was later confirmed by Cal and Betty.

I still own that wulfenite, and I wonder what the odds are for a mineral specimen to be sold across the country and end up, within two months, eight miles from where it started.



The Mysterious Missing Staurolite

L.H.C.

This is a true story, and although it happened many years ago it is as fresh in my mind as though it were yesterday. The names have been omitted to protect the guilty as well as the innocent.

The year was almost certainly 1969 and I had not been occupying my 2 West 46th Street showroom very long. It was, I recall, a very nice Spring day and I was being visited by a man-and-wife collecting team from out-of-town who I am still in touch with today. They collect mostly miniature-sized minerals and have had much success with their displays. They choose their specimens very carefully and their collection reflects this discrimination.

On this particular day they had finally narrowed down their selection to a really lovely, bright, twinned staurolite crystal from Brazil that had been collected at the source by Richard Gaines. Their selecting style however, unlike many other collectors, does not involve taking the specimens out of the display cases and making decisions, in hand, at a desk or table. So the candidate for the sale remained in my cabinet.

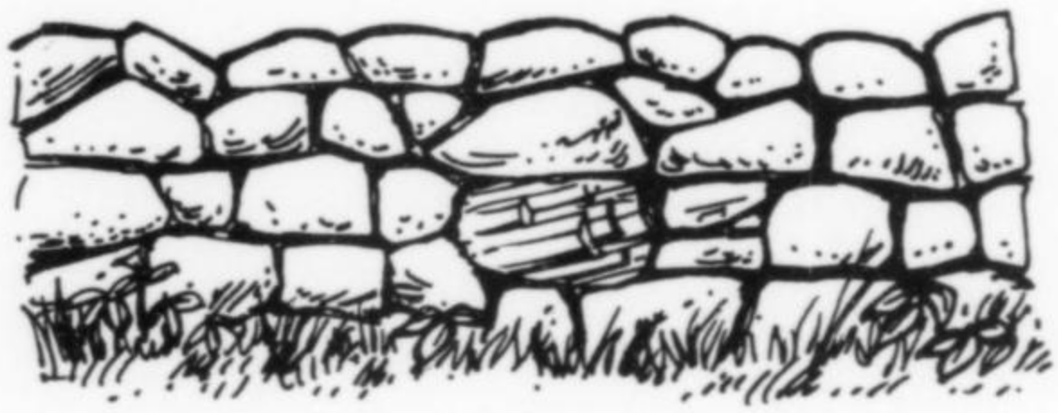
While they were deciding, another collector (who I knew from previous encounters) arrived and asked if he could browse. After a while the collector team decided to purchase the staurolite, I went to the cabinet to get it, and it was *gone.*

The word "encounter" used in the last sentence was carefully chosen because I was aware at that time of this collector's somewhat unsavory reputation. I thought, however, that with careful observation I would be safe in admitting him; but somehow, from behind the closed cabinet doors, he had managed to *pilfer that staurolite;* at least that is what I decided at that moment. In some weird way I found myself being impressed with, and amazed at, his skill. If he had chosen any other specimen to steal he almost certainly would have gotten away with it.

So I sprang into (verbal) action. I told the couple that their chosen specimen had disappeared, and I could not explain it. I then, in a forceful voice, invoked the name of the Deity and assured them that somehow, He would, as if it were a miracle, make that staurolite reappear. In the meantime the thief admitted he had, indeed, seen it and that it was really a junky specimen that *he* would certainly not want. The couple looked absolutely dumbfounded and could not figure out what was going on. I repeated my heavenly invocation and strategically moved to block the door.

And then, just like in a true miracle, the staurolite mysteriously re-appeared *rolling* across the floor of my showroom! I picked it up and, after assuring myself that it was unharmed, handed it over to my open-mouthed friends, saying something like—look how God came through after all. I then turned to the would-be thief and told him to leave and never to come back. After he left I discussed the matter with the couple, but, of course, they had figured it all out by then.

The epilogue to this story is that the thick-skinned, would-be thief showed up at my office a few years later but, of course, was refused admittance.



A Beryl Find

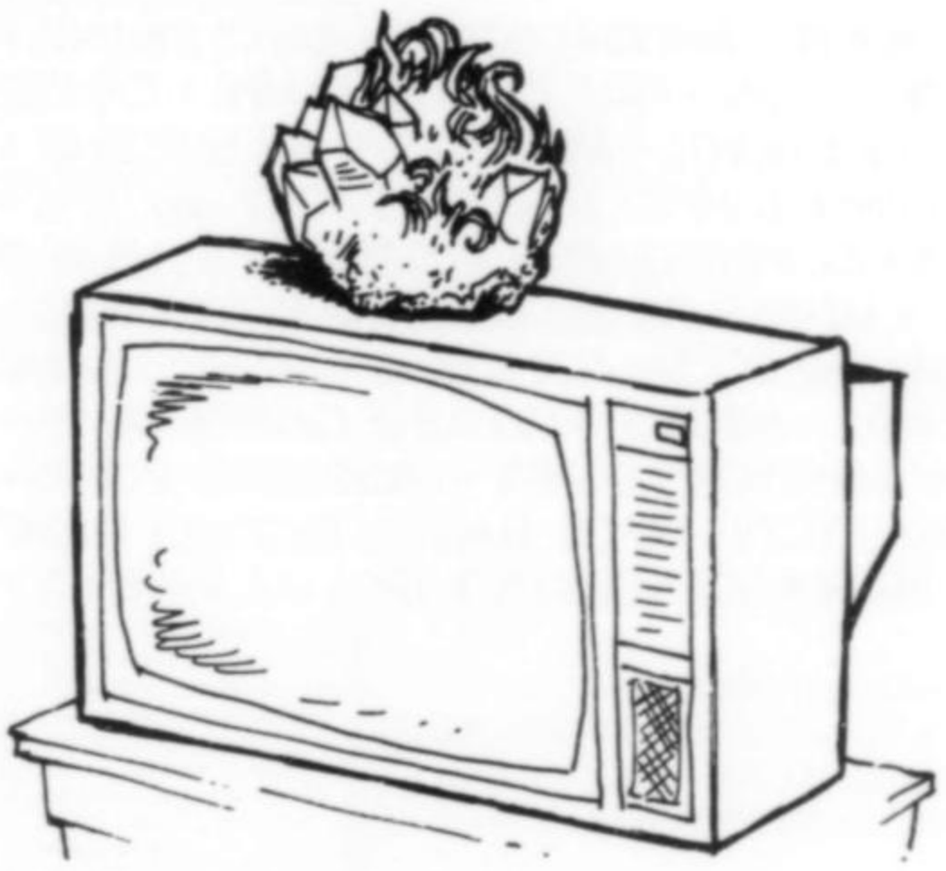
Charles B. Sclar

It was a hot and humid day in July of 1942 when a group of three teenage mineral collectors, recently smitten with the beauty of minerals, set off on a collecting trip from New York City to the pegmatite quarries at Bedford, New York. We had examined intensively the mineral exhibits at the American Museum of Natural History in Manhattan and had studied the collecting guides of Manchester and others on the minerals of the metropolitan area. We decided to focus on beryl as a target. Fired with the enthusiasm of beginners and armed with knapsacks, hammers and cold chisels, we took a train from Grand Central Station and got off at Bedford. We then hiked about 6 miles (it seemed like 10 miles in the heat) to the abandoned pegmatite quarries.

After several hours of searching, however, we had found only a few small broken chips of beryl, but we did find abundant sheets of muscovite, large cleavages of pink microcline, black tourmaline and some poor crystals of smoky quartz. In our naive enthusiasm, we were not aware of how

heavily picked over some of the classical mineralogical sites could be, even in 1942.

Discouraged, we set off on the long walk back to the train station. About halfway back we stopped to rest on a stone wall by the side of the road. As I looked down at my feet to avoid the poison ivy vines growing on the wall, I noticed an angular 7-inch greenish boulder in the middle of the wall. We hastily disassembled the dry (unmortared) stone wall, removed the green boulder, and then reassembled the wall. The green boulder was a monomineralic mass of beryl, on one side of which was a "striated" columnar aggregate of beryl crystals 6 inches long and 4 inches wide, just like those illustrated in mineralogical texts! What a thrill! I still have the specimen in my collection. Of the three intrepid collectors that day, two became professional geoscientists: one had a career in petroleum geology with a major producer; the other (myself) had a professional career as a mineralogist-petrologist in industrial research and as a university professor.



The Best Deals Passed By

Art Smith

In June of 1971, when I was working for Texaco, a fellow geologist and I decided to combine our family vacations with a mineral collecting trip to Colorado. So, with vehicles loaded with our families and camping gear we batted across the hot flatlands of Texas and New Mexico and into the cool San Juan Mountains at Creede, Colorado.

Finding an ideal camping place proved a problem since all the campgrounds were along the swift-flowing Rio Grande River, and with young curious children in tow we wanted no part of it. We finally settled in a secluded spot in 30-mile Campground which is about that distance west of Creede.

The next day we left the women and children and with our collecting gear headed back to Creede and Emperius's Commodore Number Five mine north of town on West Willow Creek. I parked on a leveled part of the dump across the road from the mine's ore bin and we climbed out. Jeff quickly located a large mass of pyrite from which he trimmed a nice, large cabinet-sized bright botryoidal specimen and placed it in the Scout next to the driver's seat and spare gas tank switch.

We spent the next few hours combing the dump; it was loaded with microcrystals of chalcopyrite, sphalerite, quartz, galena and pyrite and we also found rare native silver wires. The trouble was, Jeff did not collect microminerals, and so with interest waning he half-heartedly picked away at the canyon wall next to the road. A teenager on a motorcycle stopped and asked him what he was looking for.

"Silver!" was Jeff's reply.

"My dad is a miner at the Bull Dog mine and he has lots of it and will probably give you some," said the boy.

"Better come over here and listen to this," Jeff called to me. So I did.

"My dad gets home at 4:30. Come see us at our trailer."

So, with directions in hand we promised to meet him at 4:30 at his trailer in the trailer park at the south end of town. Unfortunately it was now 3 o'clock and we were due back at our camp in 30 minutes. However, we both could see the opportunity of a lifetime knocking, and visions of silver danced in our heads. Who could collect the dumps with the good stuff within easy reach? So we climbed back to the Scout and hastily packed our collected material.

The large pyrite was a little in my way. So I asked, "Do you really want this big glob of pyrite?"

"Yeah, I think so," was the reply.

"It probably contains a lot of marcasite and will be a pile of white powder in six months," I warned. "Why not just leave it?"

"Okay," agreed Jeff; I quickly tossed it out the door and we drove off.

[I should mention here that six months later, at another Texaco geologist's Christmas party in Houston, my eye was attracted by a large, showy, botryoidal pyrite on his mantle. There was no doubt it was Jeff's piece, and inquiry confirmed that he had picked it up from the dump several days after we were there. As far as I know it is still bright and shiny with no alteration.]

After getting a refreshing drink in town and some groceries on the list for supper we drove to the trailer park but only the boy was there.

"Dad should be home at any minute."

But the minutes rapidly slipped away. We were offered some rocks for sale but they were only junk. Five o'clock came, then 6 o'clock, no miner. I started pleading with Jeff to get going back to camp because we were already 3 hours late. At six thirty he relented and we slowly started to drive away. As we left the trailer park a pickup truck turned in.

"That's him I bet!" and I did a quick U-turn on the highway back to the trailer which now had the pickup parked beside it.

We knocked and the boy opened the door and explained our presence to the miner who had obviously been hoisting something besides ore. We were warmly welcomed into the trailer. And there on the top of the TV was a large, spectacular specimen of milky quartz and native silver with a large rope of native silver twisted across the top!

"Wow!"

But what was to be *our* treasure was under the bed in the other room, where some boxes yielded small but nice specimens of quartz crystals, amethystine quartz, silver (wires

and microcrystals), tabular barite, sphalerite crystals, galena crystals, chalcopyrite crystals, and massive ruby silver (pyrargyrite). We were generously given samples of each and any money in return was refused.

"I can't take money for something I just pick up off the ground. It doesn't seem right," was the reply.

We joyously left the room with our hands and arms full of specimens, realizing that our follow-through and wait was a true bonanza.

After much small talk and on our way out the trailer door, I looked again at the specimens on the TV and shook my head in appreciation.

"Yeah," remarked the miner, "someday I may sell that thing for fifty dollars."

I do not know if our brains were jammed by thinking of the specimens we already had in hand or what was going to face us when we got back to camp, five hours late, with the uncooked supper. But it was several days and a few hundred miles down the road that we both realized we could have had that magnificent specimen for fifty bucks. Any suggestion we turn back in the presence of our wives resulted in silence and cold stares. So to prevent probable mutiny we dropped the subject and no doubt someone else now has the silver.

New Minerals Recently Approved

BY THE
COMMISSION ON
NEW MINERALS AND MINERAL NAMES
INTERNATIONAL MINERALOGICAL ASSOCIATION

J. A. Mandarino, Chairman Emeritus
Commission on New Minerals and Mineral Names
International Mineralogical Association

The information given here is provided by the Commission on New Minerals and Mineral Names, I.M.A. for comparative purposes and as a service to mineralogists working on new species.

Each mineral is described in the following format:

Chemical Formula
Any relationship to other minerals
IMA No. _____

Crystal system, space group. Unit cell parameters. Color; luster; diaphaneity. Optical properties. Strongest lines in the X-ray powder diffraction pattern.

The underlined space is provided to write in the name when published.

The names of these approved species are considered confidential information until the authors have published their descriptions or released information themselves.

NO OTHER INFORMATION WILL BE RELEASED BY THE COMMISSION.

1994 PROPOSALS

$Mg(Fe^{3+},Fe^{2+},Al,Ti,Mg)(BO_3)O$
The Fe^{3+}-dominant analog of warwickite
IMA No. 94-001 _____

Orthorhombic: Pnam. a 9.258(6), b 9.351(4), c 3.081(2) Å. Black; adamantine to submetallic; subtranslucent to nearly opaque. In reflected light: light grey, weak anisotropism, indistinct bireflectance, pleochroic from dark red to dark brown. R_{max}: (9.99 %) 470nm, (9.66 %) 540nm, (9.29 %) 589nm, (8.79 %) 650nm. 6.563 (23), 4.176 (38), 2.957 (30), 2.570 (100), 2.088 (20), 1.591 (18), 1.550 (19).

$Mn_2SiO_3(OH)_2 \cdot H_2O$
IMA No. 94-002 _____

Orthorhombic: $Pca2_1$. a 12.682(4), b 7.214(2), c 5.337(1) Å. Brown-yellowish; vitreous; transparent. Biaxial (-), α 1.681, β 1.688 γ 1.690, 2V(meas.) 54.4°, 2V(calc.) 56.1°. 7.220 (60), 4.083 (60), 3.011 (100), 2.547 (80), 2.456 (80), 2.440 (80), 1.552 (60).

$NaNa_2Mn^{2+}_2Mn^{3+}_3Si_8O_{24}$
A member of the amphibole group
IMA No. 94-004 _____

Monoclinic: C2/m. a 9.89(2), b 18.04(3), c 5.29(1) Å, β 104.6(1)°. Cherry red to very dark red; adamantine; transparent. Biaxial (-), α 1.717, β 1.780, γ 1.800, 2V(meas.) 51°, 2V(calc.) 57°. 3.400 (8), 3.146 (9), 2.544 (9), 2.176 (10), 1.656 (8), 1.447 (9).

$(Zn,Cu)_6Zn_2(OH)_{13}[(Si,S)(O,OH)_4]_2$
IMA No. 94-005 _____

Hexagonal (trigonal): $P\bar{3}$. a 8.322(1), c 7.376(1) Å. Light green; vitreous; transparent. Uniaxial (-), ω 1.705, ε 1.611. 7.37 (100), 3.623 (25), 3.282 (30), 2.724 (30), 2.556 (50), 2.191 (15), 1.572 (20).

$(Mg_{1-x}\square_x)_2Mg_{12}(PO_4)_6(PO_3OH)_2O_6H_{6+4x}$
x = 0 to 0.3
IMA No. 94-006 _____

Hexagonal: $P6_3mc$. a 12.47(1), c 5.036(6) Å. Azure blue; vitreous; transparent. Uniaxial (-), ñ ~ 1.61, Δ ~ 0.01. 3.66 (65), 3.15 (100), 3.109 (100), 2.692 (95), 2.213 (70), 1.803 (50), 1.552 (50).

$Na_3(Fe^{2+},Fe^{3+})_6[Ti_2Si_{12}O_{30}(O,OH)_4](OH,O)_7 \cdot 2H_2O$
IMA No. 94-007 _____

Monoclinic: P2/c. a 5.353(4), b 16.18(1), c 21.95(2) Å, β 94.6(2)°. Dark brown-green; vitreous to silky; translucent. Biaxial (-), α 1.627, β 1.667, γ 1.693, 2V(meas.) 75°, 2V(calc.) 76°. 13.00 (30), 10.94 (100), 4.44 (30), 2.728 (50), 2.641 (40), 2.547 (30), 2.480 (30).

$AgFeS_2$
IMA No. 94-008 _____

Tetragonal: $P4_2mc$. a 5.64(1), c 10.34(3) Å. Megascopic color not observed; metallic; opaque. In reflected light: cream with a greyish tint, moderate anisotropism, no bireflectance, nonpleochroic. R_{min} & R_{max}: (27.2, 30.1 %) 470nm, (32.3, 36.4 %) 546nm, (33.0, 37.1 %) 589nm, (31.2, 35.3 %) 650nm. 3.15 (10), 2.445 (2), 2.340 (2), 1.910 (4), 1.692 (2).

$K(K,Na,\square)(Mn,Zr,Y)_2(Zn,Li)_3Si_{12}O_{30}$
A member of the milarite group
IMA No. 94-010 _____

Hexagonal: P6/mcc. a 10.196(5), c 14.284(8) Å. Dark blue, violet blue, greyish brown-blue; vitreous; transparent. Uniaxial (-), ω 1.590, ε 1.586. 7.13 (30), 4.15 (45), 3.75 (50), 3.25 (100), 2.924 (39), 2.777 (32), 2.548 (520).

$(NH_4,K)NO_3$

IMA No. 94-011

Orthorhombic: Pbnm. a 7.075(5), b 7.647(5), c 5.779(5) Å. White; vitreous; transparent. Biaxial (-), α 1.458, β 1.527, γ 1.599, 2V(meas.) ~ 90°, 2V(calc.) 87°. 3.863 (75), 3.364 (85), 3.212 (95), 3.194 (100), 2.805 (35), 2.595 (90), 2.400 (50).

$(Na,Mn,Fe,Al,REE)_{15}(Y,REE,Ca,Na)_2(CO_3)_9(SO_3F)Cl$

IMA No. 94-012

Hexagonal: P3. a 8.773(1), c 10.746(2) Å. Yellow to orange-brown; vitreous; transparent. Uniaxial (-), ω 1.548, ε 1.537. 6.20 (40), 4.39 (80), 2.774 (80), 2.532 (100), 2.240 (80), 2.067 (30), 1.657 (40).

$Cu_2Zn[(As,Sb)O_4](OH)_3$

IMA No. 94-013

Hexagonal (trigonal): P$\bar{3}$. a 8.201 (1), c 7.315 (1) Å. Emerald green; adamantine; transparent. Uniaxial (-), ω 1.801, ε 1.796. 2.522 (100), 2.166 (88), 1.805 (92), 1.550 (100), 1.513 (85).

$CuNiSb_2$

IMA No. 94-014

Hexagonal (trigonal): P$\bar{3}$m1. a 4.0489(2), c 5.1358(3) Å. Silver-white; metallic; opaque. In reflected light: white with yellowish hue, distinct anisotropism, weak bireflectance, nonpleochroic. R_O & R_E: (59.3, 52.4 %) 470nm, (63.0, 56.8 %) 546nm, (65.5, 60.9 %) 589nm, (68.6, 64.9 %) 650nm. 2.901 (100), 2.572 (10), 2.074 (65), 2.023 (51), 1.660 (11), 1.284 (10).

$(Zn,Fe^{2+})_{1-2x}Ti_xAl_2O_4$ $x \sim 0.12$

The Zn-dominant analog of högbomite-*8H*

IMA No. 94-016

Hexagonal: most probably $P6_3mc$. a 5.708(4), c 18.31(2) Å. Deep brown to black; adamantine; transparent in thin sections. Uniaxial (-), ω 1.878, ε 1.832. 2.85 (50), 2.60 (80), 2.42 (100), 1.592 (60), 1.550 (50), 1.470 (70), 1.425 (80).

$Na_8(Mn,Fe^{3+},Ti)_2Si_{10}O_{25}(OH,Cl)_4 \cdot 10H_2O$

IMA No. 94-017

Orthorhombic: $C222_1$. a 13.46(2), b 14.98(1), c 17.51(2) Å. Yellow to orange; vitreous; transparent. Biaxial (+), α 1.532, β 1.540, γ 1.550, 2V(meas.) 89°, 2V(calc.) 84°. 10.049 (100), 8.823 (50), 5.025 (20), 3.806 (20), 2.718 (50).

$PbCa_2Al(F,OH)_9$

IMA No. 94-018

Monoclinic: A2, A2/m or Am. a 23.905(5), b 7.516(2), c 7.699(2) Å, β 92.25(2)°. White to colorless; vitreous; transparent. Biaxial (-), α 1.510, β 1.528, γ 1.531, 2V(meas.) 36°, 2V(calc.) 44°. 11.9 (100), 3.71 (70), 3.51 (85), 2.98 (60), 2.94 (60), 2.027 (60), 1.971 (60).

$(Co,Mg,Ni)Al_2(SO_4)_4 \cdot 22H_2O$

The cobalt-dominant member of the halotrichite group

IMA No. 94-019

Monoclinic: $P2_1/c$. a 6.189(4), b 24.23(1), c 21.20(1) Å, β 100.33(5)°. Empire rose; silky; transparent. Biaxial (sign unknown), α 1.477, β unknown, γ 1.484, 2V unknown. 6.03 (22), 4.790 (100), 4.295 (27), 4.106 (22), 3.945 (26), 3.768 (33), 3.494 (92).

$Pb(Zn,Fe^{3+})_3(Fe^{3+},Mn^{3+},Mn^{4+},Al,Ti)_9O_{19}$

A member of the magnetoplumbite group

IMA No. 94-020

Hexagonal: $P6_3/mmc$. a 5.854(1), c 22.882(6) Å. Black; metallic; opaque. In reflected light: black, isotropic, no bireflectance, nonpleochroic. R_{mean}: (23.8 %) 470nm, (22.4 %) 546nm, (21.7 %) 589nm, (20.7 %) 650nm. 11.39 (45), 3.811 (100), 2.858 (75), 2.745 (50), 2.605 (40), 2.407 (25), 1.6361 (30).

$Pb(Ga,Al,Fe)_3(AsO_4)(SO_4)(OH)_6$

The gallium-dominant analog of beudantite

IMA No. 94-021

Hexagonal: R3m. a 7.225(4), c 17.03(2) Å. Pale yellow; vitreous; transparent. Uniaxial (-), ω 1.763, ε 1.750. 5.85 (90), 3.59 (40), 3.038 (100), 2.851 (30), 2.513 (30), 2.271 (40), 1.948 (30).

$Y_3Si_3O_{10}F$

The F-analog of thalenite-(Y)

IMA No. 94-022

Monoclinic: $P2_1/n$. a 7.321(2), b 11.133(4), c 10.375(6) Å, β 97.17(2)°. Colorless to white; adamantine; translucent. Biaxial (-), α 1.719, β 1.739, γ 1.748, 2V(meas.) 73°, 2V(calc.) 67°. 5.60 (5), 3.81 (5), 3.12 (10), 2.828 (8), 2.253 (8), 2.187 (4), 2.131 (4).

Ir_3Fe

The Ir-dominant analog of isoferroplatinum

IMA No. 94-023

Cubic: Pm3m. a 3.792(5) Å. Steel black; metallic; opaque. In reflected light: bright white with yellowish tint, isotropic, nonbireflectant, nonpleochroic. R: (66.2 %) 470nm, (69.3 %) 546nm, (71.1 %) 589nm, (72.5 %) 650nm. 2.18 (80), 1.89 (60), 1.34 (70), 1.26 (20), 1.200 (15), 1.142 (100), 1.094 (80).

$(UO_2)Bi_4O_4(AsO_4)_2 \cdot 2H_2O$

An orthorhombic polymorph of walpurgite

IMA No. 94-024

Orthorhombic: Pbcm. a 5.492(1), b 13.324(2), c 20.685(3) Å. Yellow; adamantine; transparent. Biaxial (-), α 1.90, β 1.99, γ 2.00 (calc.), 2V(meas.) 36°. 10.354 (94), 5.610 (40), 3.277 (56), 3.208 (100), 3.088 (76), 2.999 (50), 2.852 (46).

$(UO_2)_8(SO_4)(OH)_{14} \cdot 13H_2O$

IMA No. 94-025

Monoclinic: $P2_1/a$. a 18.553(8), b 9.276(2), c 13.532(7) Å, β 125.56(2)°. Yellow; vitreous; translucent. Biaxial (-), α 1.715, β 1.718, γ 1.720, 2V(calc.) 78°. 7.56 (100), 7.13 (48), 3.771 (34), 3.554 (20), 3.234 (10), 3.206 (13), 2.052 (8).

$NaCa_2[B_9O_{14}(OH)_4] \cdot 2H_2O$

IMA No. 94-026

Monoclinic: $P2_1/c$. a 11.4994(8), b 12.5878(9), c 10.5297(1) Å, β 99.423(6)°. Colorless to light dirty-yellow and light grey; vitreous; transparent. Biaxial (+), α 1.532, β 1.538, γ 1.564, 2V(meas.) 54°, 2V(calc.) 52°. 5.41 (66), 5.20 (57), 4.20 (56), 3.35 (89), 3.27 (59), 3.04 (100), 2.210 (59).

$Pb_2Bi_2(S,Se)_3$

IMA No. 94-030

Hexagonal (trigonal): P$\bar{3}$ or P$\bar{3}$m. a 4.191(2), c 39.60(3) Å. Silver-grey; metallic; opaque. In reflected light: yellowish-white, distinct anisotropism, practically absent bireflectance, bluish-grey to brownish pleochroism. R_1 & R_2: (49.7, 48.5 %) 470nm, (48.4, 47.4 %) 546nm, (47.9, 46.8 %) 589nm, (47.9, 46.2 %) 650nm. 3.42 (5), 3.04 (10), 2.096 (8), 1.806 (6), 1.725 (5), 1.298 (7), 1.233 (6).

HgSAg(Cl,Br)

IMA No. 94-031

Hexagonal: $P6_2$, $P6_4$, $P6_222$ or $P6_422$. a 8.234(4), c 19.38(1) Å. Red to brownish red; adamantine; translucent. Uniaxial (-), ω 2.3 (from polished section), ε could not be measured). 6.47 (20), 4.124 (30), 3.357 (60), 3.237 (30), 3.127 (50), 2.879 (100), 2.009 (50).

Si_3N_4

IMA No. 94-032

Hexagonal (trigonal): P31c. a 7.758(5), c 5.623(5) Å. Brownish red to colorless; probably adamantine; transparent. Uniaxial (-), ω 2.03, ε 2.02. 2.893 (85), 2.599 (75), 2.547 (100), 2.320 (60), 1.486 (70), 1.418 (60), 1.351 (75).

$(Ba,K,Pb)Na_3(Ca,Sr)(Fe,Mg,Mn)_{14}Al(OH)_2(PO_4)_{12}$

Isostructural with the arrojadite-dickonsonite series

IMA No. 94-033

Monoclinic: C2/c. a 16.406(5), b 9.945(3), c 24.470(5) Å, β 105.73(2)°. Greenish-grey; greasy; translucent. Biaxial (sign unknown), $n_{average}$ 1.65. 3.186 (45), 3.018 (100), 2.824 (39), 2.813 (36), 2.685 (50), 2.530 (35).

$Mg(V,Cr)_2O_4$

The magnesium-analog of coulsonite

IMA No. 94-034

Cubic: Fd3m. a 8.385(3) Å. Black; metallic; opaque. In reflected light: light grey, isotropic, no bireflectance, nonpleochroic. R: (14.0 %) 470nm, (13.7 %) 546nm, (13.7 %) 589nm, (13.7 %) 650nm. 4.84 (9), 2.52 (10), 2.093 (8), 1.612 (8), 1.482 (9), 1.092 (7), 1.048 (5).

$(Na,Ca,K)Cu_3(AsO_4)_2Cl\cdot 5H_2O$

IMA No. 94-035

Tetragonal: $P4_22_12$ or $P4_222$. a 10.085(2), c 23.836(8) Å. Intense blue to emerald green; vitreous; translucent. Uniaxial (-), ω 1.686, ε 1.635. 11.90 (100), 9.29 (60), 7.132 (50), 5.043 (60), 4.641 (40), 3.098 (80), 3.061 (70).

$Hg_6^{1+}Hg^{2+}[Cl,(OH)]_2O_3$

IMA No. 94-036

Orthorhombic: Pbma. a 11.790(3), b 13.881(4), c 6.450(2) Å. Black to very dark brown; metallic; opaque. In reflected light: white, strong anisotropism, moderate bireflectance, pleochroic from white to a higher reflecting blue-white. R_1 & R_2: (22.8, 29.6 %) 470nm, (20.7, 25.7 %) 546nm, (20.3, 24.6 %) 589nm, (20.2, 23.2 %) 650nm. 5.25 (80), 3.164 (60), 3.053 (100), 2.954 (70), 2.681 (50), 2.411 (50).

$Ag(Cd,Pb)AsS_3$

IMA No. 94-038

Tetragonal: I4/amd. a 5.499(5), c 33.91(4) Å. Grey; metallic; opaque. In reflected light: greyish white with bluish tint; anisotropism, bireflectance and pleochroism not observed. R_O: (31.3 %) 470nm, (30.4 %) 543nm, (29.3 %) 587nm, (27.1 %) 657nm. 3.19 (50), 2.77 (100), 1.960 (80), 1.679 (70), 1.598 (70), 1.274 (60).

$Cu_3^{2+}Te^{6+}O_6\cdot 2H_2O$

IMA No. 94-043

Monoclinic: $P2_1/n$. a 9.204(2), b 9.170(2), c 7.584(1) Å, β 102.32(3)°. Emerald green; adamantine; transparent. Biaxial (sign unknown), n 1.91 - 1.92. 6.428 (100), 3.217 (70), 2.601 (40), 2.530 (50), 2.144 (35), 1.750 (35).

$Fe^{3+}(Mn,Fe^{2+},Mg)(PO_4)O$

IMA No. 94-045

Monoclinic: I2/a. a 9.977(2), b 6.339(2), c 11.836(3) Å, β 105.77(3)°. Black; weakly submetallic; opaque. Optical properties could not be measured due to the opaque nature of the mineral. 3.256 (23), 2.970 (100), 2.861 (35), 2.810 (98), 2.064 (25), 1.778 (22).

$(K,Na)Ca_2(Mg,Fe^{2+},Al,Fe^{3+},Ti)_5(Si,Al)_8O_{22}[(OH),F,O]_2$

A member of the amphibole group

IMA No. 94-046

Monoclinic: C2/m. a 9.9199(4), b 18.0591(8), c 5.3180(3) Å, β 105.36(1)°. Black; vitreous; opaque, but translucent in thin splinters. Biaxial (-), α 1.654, β 1.664, γ 1.670, 2V(meas.) = 79°, 2V(calc.) = 75°. 8.45 (95), 3.283 (45), 3.140 (100), 2.707 (35), 2.344 (70), 2.018 (35), 1.652 (40).

(Cu,Fe)(Sn,Sb)

IMA No. 94-047

Tetragonal: space group unknown. a 4.22(1), c 5.10(3) Å. Megascopic color was not observed; metallic; opaque. In reflected light: pinkish-white, distinct anisotropism, distinct bireflectance, pleochroic from light pink to pinkish-white. $R_{max.}$ & $R_{min.}$: (72.6, 64.8 %) 470nm, (77.4, 68.2 %) 546nm, (78.5, 68.9 %) 589nm, (79.0, 69.0 %) 650nm. 2.96 (9), 2.10 (10), 1.72 (3), 1.488 (3), 1.214 (4), 1.092 (4).

$(Mn^{2+},Ca)(La,Ce,Ca)(Al,Mn^{3+},Mn^{2+})_3(Si_3O_{11})O(OH)$

A member of the epidote group

IMA No. 94-048

Monoclinic: $P2_1/m$. a 8.891(3), b 5.704(3), c 10.107(8) Å, β 113.99(2)°. Brown-red; vitreous; transparent. Because of the small grain size, most of the optical properties could not be determined. 2.897 (100), 2.857 (45), 2.707 (60), 2.615 (60), 2.178 (60), 2.145 (60).

$Mn_3(Nb,Ta)_3(Nb,Mn)_2W_2O_{20}$

IMA No. 94-049

Monoclinic: $P2_1$. a 24.73(2), b 5.056(3), c 5.760(3) Å, β 103.50(7)°. Red to brown-red; metallic; opaque. In reflected light: light grey, weak anisotropism, weak bireflectance, nonpleochroic. $R_{max.}$ & $R_{min.}$: (19.2, 18.0 %) 470nm, (18.5, 17.5 %) 546nm, (19.3, 18.5 %) 589nm, (16.5, 16.0 %) 650nm. 6.0 (5), 3.74 (8), 3.69 (8), 2.98 (10), 1.783 (5), 1.744 (6), 1.732 (7), 1.456 (5).

$K_3Na_3Ca_5(Si_{12}O_{30})(F_3OH)\cdot H_2O$

An F-dominant, triclinic polymorph of canasite, with additional H_2O

IMA No. 94-050

Triclinic: P1. a 10.0941(3), b 12.6913(2), c 7.2405(1) Å. α 90.00(2)°, β 111.02(2)°, γ 110.20(2)°. Lilac-grey, blue-grey, rarely greenish; vitreous; translucent. Biaxial (-), α 1.536, β 1.539, γ 1.542, 2V(meas.) = 70°, 2V(calc.) = 89.8°. 5.88 (37), 4.70 (54), 4.21 (40), 3.01 (25), 2.915 (100), 2.354 (30), 2.307 (21).

$Pb_2Bi_2Te_2S_3$

IMA No. 94-051

Hexagonal: space group unknown. a 4.230(4), c 33.43(2) Å. Dark grey to black; metallic; opaque. In reflected light: greyish-white with a slight pinkish tint, very faint anisotropism, very weak bireflectance, nonpleochroic. R_O & R_E: (40.4, 39.3 %) 470nm, (42.1, 40.8 %) 546nm, (41.3, 40.8 %) 589nm, (41.9, 40.9 %) 650nm. 3.35 (40), 3.06 (100), 2.22 (25), 2.115 (50), 1.311 (25), 1.213 (25).

$K_2Na_4Ca_3Ti_2Be_4Si_{12}O_{38}$

IMA No. 94-052

Orthorhombic: Fddd. a 12.778(4), b 14.343(3), c 33.69(1) Å. Pink, dark red, seldom white; vitreous; transparent. Biaxial (+), α 1.630, β 1.644(calc.), γ 1.675, 2V(meas.) = 70°. 9.23 (9), 4.15 (10), 3.30 (10), 3.16 (10), 2.53 (10), 2.42 (10), 1.582 (9).

$Na_2C_2O_4$

IMA No. 94-053

Monoclinic: $P2_1/a$. a 10.426(9), b 5.255(5), c 3.479(3) Å, β 93.14(8)°. Pale yellow; vitreous; transparent. Biaxial (-), α 1.415, β 1.524, γ 1.592, 2V(meas.) = 72°, 2V(calc.) = 72°. 5.203 (13), 2.898 (27), 2.826 (100), 2.602 (56), 2.334 (33), 2.177 (13), 2.041 (14).

$Na_3Mg_3Ca_5Al_{19}Si_{117}O_{272}\cdot 93H_2O$

A member of the zeolite group

IMA No. 94-054

Orthorhombic: Cmca. a 13.698(2), b 25.213(3), c 22.660(2) Å. Colorless to light straw; vitreous; transparent. Biaxial (-), α 1.480, β 1.485, γ 1.486, 2V(meas.) <60°, 2V(calc.) 48°. 11.34 (100), 10.64 (31), 4.64 (35), 4.37 (79), 4.01 (57), 3.938 (36), 3.282 (68).

$SrCuSi_4O_{10}$

A member of the cuprorivaite group

IMA No. 94-055

Tetragonal: P4/ncc. a 7.366(1), c 15.574(3) Å. Color; vitreous; transparent. Uniaxial (-), ω 1.630, ε 1.590. 7.79 (35), 3.444 (40), 3.330 (100), 3.119 (55), 3.033 (50), 2.605 (30), 2.322 (30).

$Ag_{24}HgAs_5S_{20}$

IMA No. 94-056

Hexagonal: space group unknown. a 15.00(1), c 15.46(3) Å, Wine-red to violet; metallic; opaque. In reflected light: grey, weak to moderate anisotropism, very low bireflectance, weak pleochroism. $R_{max.}$ & $R_{min.}$: (31.0, 30.3 %) 470nm, (29.2, 27.6 %) 546nm, (27.6, 26.0 %) 589nm, (24.6, 23.9 %) 650nm. 3.17 (6), 3.091 (10), 2.998 (4), 2.755 (3), 1.878 (8).

$(Sr,Pb)(Y,U)(Ti,Fe^{3+})_{20}O_{38}$

A member of the crichtonite group

IMA No. 94-057

Hexagonal (rhombohedral): $R\bar{3}$. a 9.197(1), α 68.75(2)°. Black; metallic; opaque. In reflected light: ash-grey with pale bluish tones, weak anisotropism, low bireflectance, very weak pleochroism. R_1 & R_2: (17.73, 17.22 %) 470nm, (17.14, 16.50 %) 546nm, (16.54, 16.11 %) 589nm, (16.48, 16.00 %) 650nm. 3.412 (m), 2.902 (m), 2.846 (mw), 2.499 (mw), 1.916 (mw), 1.603 (m), 1.441 (m).

$BaMn_2^{3+}[Si_2O_7](OH)_2\cdot H_2O$

The Ba-analog of hennomartinite

IMA No. 94-058

Orthorhombic: Cmcm (?). a 6.325(1), b 9.120(1), c 13.618(1) Å. Dark brown; earthy to brilliant; translucent to transparent. Biaxial (-), α 1.82, β 1.845 (calc.), γ 1.85, 2V(meas.) 46°. 4.85 (100), 4.557 (50), 4.322 (59), 3.416 (77), 2.869 (80), 2.729 (82).

$(Na,K)(Ca,Na,Fe^{2+})_2Mg_5(Si,Al)_8O_{22}(F,O,OH)_2$

A member of the amphibole group

IMA No. 94-059

Monoclinic: C2/m. a 9.893(4), b 18.015(5), c 5.279(3) Å, β 104.61(4)°. Grey to black; vitreous; opaque, but thin fragments are transparent. Biaxial (-), α 1.603, β 1.613, γ 1.623, 2V(meas.) 90°, 2V(calc.) 89°. 9.06 (6), 8.46 (8), 3.282 (9), 3.140 (10), 2.703 (6), 1.443 (7).

J. Scovil

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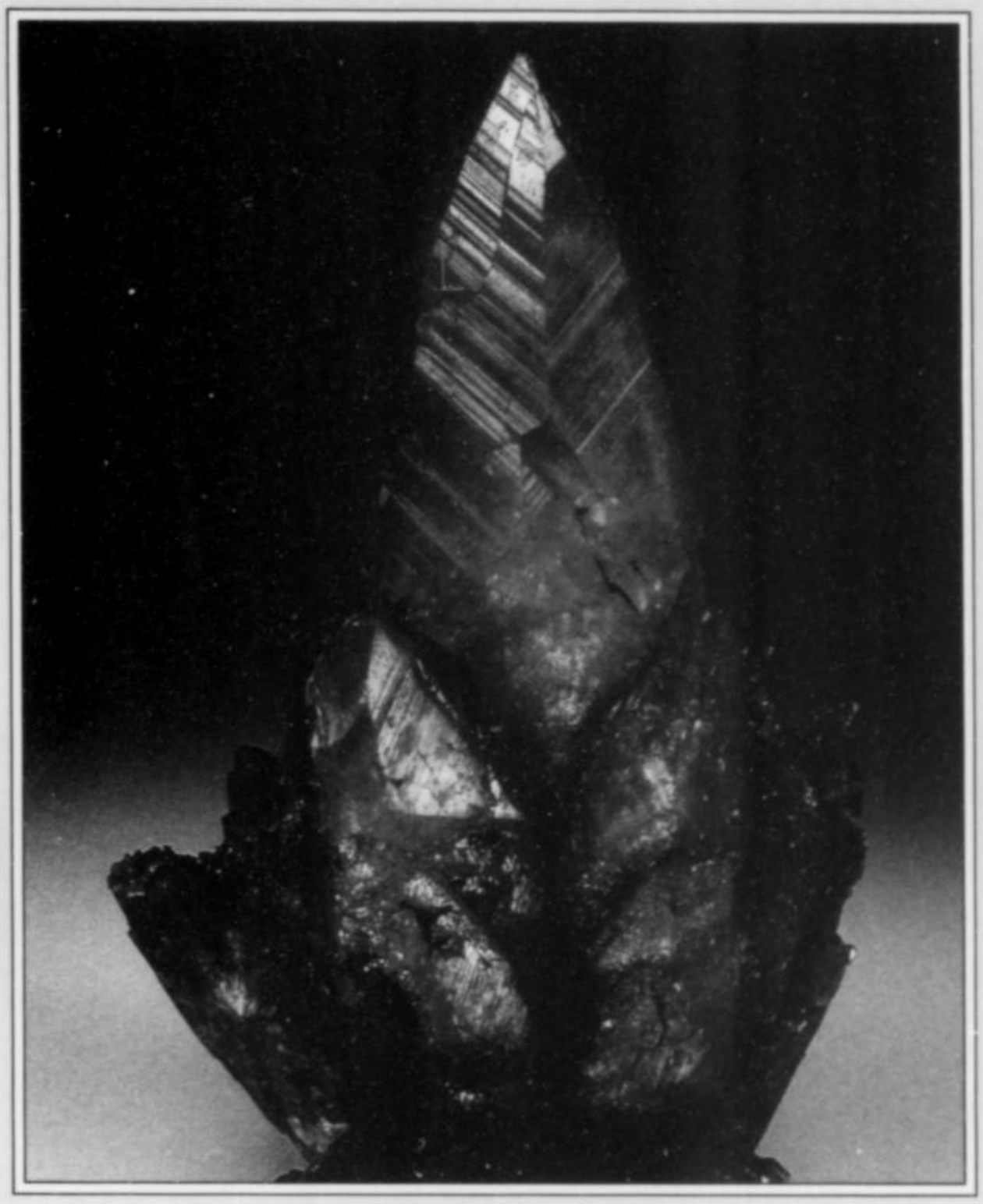

FEB. 8–11, 1996

This year it's CALCITE! Calcite minerals will be the featured species at this year's Tucson show; the exhibits are sure to be spectacular. If you've been thinking about making a trip to see the world-famous Tucson Show, this is the year to do it! Besides the extraordinary exhibits from museums and private collections worldwide, you'll see the world's top mineral dealers, publishers and program lecturers. Make your arrangements now to attend the greatest mineral event of the year.

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PHOTO: Calcite with copper, Franklin mine, Michigan; 8.5 cm; Seaman Mineral Museum collection (WEW)

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What's New in Minerals?

New Jersey Show 1995

by Joe Polityka

[April 22–23]

The New Jersey Earth Science Show was held this year in Westfield, New Jersey. It was previously held at William Paterson College about 30 miles north, so I was anxious to see if the new facility, the National Guard Armory, was better or worse than William Paterson. In my opinion the new location is better. It is larger, cooler and nearer to motels and restaurants. Obviously folks from north Jersey who live close to the old location would disagree; but it took me just 25 minutes to drive to the armory from my house, the proverbial hop, skip and jump.

Attendance, according to the show honchos, was down compared to last year. Whether this was due to the new location or to the scheduling of the show the week after Easter and Passover cannot be said with certainty. Obviously, it will take a few years to see if attendance improves. I did see, however, the usual collectors from Pennsylvania, Maryland, Connecticut and Massachusetts, in addition to the local regulars.

Thirty-six retail dealers were set up, along with 54 exhibitors. A separate section consisted of fluorescent displays, and it was superb. Unlike at other shows there is no wholesale or swap section. An outdoor swap area, with or without swapper dollars, would be a great addition. Anyone who has attended the Franklin, New Jersey or Cincinnati shows knows the excitement that is created by a swap area.

As an exhibitor I was allowed to partake in the Friday night buffet set up by the organizers of the show. This is the high point for my daughter and me. Every year I look forward to sampling this feast! No dried out pizza here! Aside from the roast beef, ham, abundant salads and desserts, there were local ethnic treats such as stuffed cabbage, kielbasa and sauerkraut and a nut roll pastry that sent me back to my childhood and memories of my Polish-American grandmother. A lot of work goes into this banquet, and Mary Guinter and her helpers must be commended.

Speaking of goodies, it is difficult to say what minerals were truly *new* finds considering the fact that a lot of specimens probably made their debut at previous shows. However, a few dealers were carrying choice specimens that require special mention.

The Collector's Edge had a good selection of Colorado **rhodochrosite** and Russian specimens. Most notable of the Russian specimens were the following: a 1-cm **platinum** crystal with sharp faces from Konder, Russia; a 30-cm matrix generously covered with sharp **ferroaxinite** crystals to 3.8 cm, from Puyva, Polar Urals; and the best Westmoreland, New Hampshire, fluorites, on matrix, that I have seen. Bryan had a 30-cm specimen with intergrown, emerald-green **fluorite** crystals up to 13 cm on an edge. He also had two cabinet-size matrix pieces with octahedrons to 3 cm on milky white, euhedral quartz druses.

Dave Wilbur was working the booth and kept everyone entertained with his tales of travels to Russia. Especially interesting were his descriptions of Aeroflot's unique takeoffs and landings! I purchased a 2-cm golden brown **scheelite** crystal on cassiterite from Tenkergin, Chukotska, Russia; a 2-cm brown **zircon** crystal on a tan-colored matrix from Lovozero, Kola Peninsula, Russia and a 2.5-cm mass of **millerite** needles on a half-geode matrix, from Hall's Gap, Kentucky.

Dave Bunk (Wheat Ridge, CO) had about 25 specimens of **pyromorphite**, from thumbnail to museum size and quality from the Bunker Hill mine, Kellogg, Idaho. He also had exceptional Bolivian **vivianite**, silver crystals from Batopilas, Mexico, and slices of **elbaite** (watermelon) from the Otjua mine, Karabib, Namibia. Dave also had a wide selection of one-of-a-kind specimens in all sizes and price ranges. I picked up a cabinet-size specimen of amethyst scepters from Kyung Sang Nam Do, Korea.

Hawthorneden had a wide selection of Brazilian specimens. Most notable were their **calcite** scalenohedrons with chlorite inclusions from Irai, Rio Grande do Sul, Brazil.

Graeber and Himes (Fallbrook, CA) had a variety of specimens including several fine **herderites** from the Bennett quarry, Buckfield, Maine; **peridots** from the recent find in Pakistan; **cerussite** crystals from Monteponi, Sardinia, Italy, and exceptional **emerald** thumbnails from Colombia.

The Rocksmiths had just received a shipment from China and Russia. Most notable were the Chinese **fluorite** and the Russian **quartz** from various locations. They also had a selection of andradite in dark brown crystals up to 1 cm, from Rudnyy, Kazakhstan.

Jendon Minerals had about 35 specimens of **gold** in quartz from Greaterville, Pima County, Arizona, in thumbnail to miniature sizes.

Parker Minerals (P.O. Box 1355, Columbia, MD) had a large selection of Franklin and Sterling Hill, New Jersey, rarities. A large group of Franklin collections, packed like sardines, crowded Fred's booth.

The Mineral Cabinet (New Providence, NJ) featured a large table full of Paterson, New Jersey, **zeolites** and associated minerals. Bill Butkowski also had about 20 specimens of exceptional **cavansite** hemispheres on white stilbite from Wagholi, India. The bright blue hemispheres, up to 1 cm, contrast well with the stilbite matrix. Bill also had three museum-quality, single white calcite crystals, up to 10 cm, from Dal'negorsk, Russia.

Williams Minerals (Rio, WV) had some green **calcite** pseudomorphs after gypsum from Yavapai County, Arizona, in miniature to small cabinet sizes. These, according to Keith, were collected by Jim Minette in 1960 and are of post-mining origin.

Another dealer present with a wide variety of choice specimens was *Wright's Rock Shop.* Chris had green **heulandite** crystals from a roadcut near Poona, India. The color is somewhere between an olive and lime-green and seems to be caused by microscopic inclusions of a chloritic mineral. *Mountain Minerals* had choice Indian zeolites and Pakistani **aquamarines**. *Willis Earth Treasures*, *STD Minerals* (Hyde Park, MA) and *Detrin Minerals* (Whitestone, NY) also had nice selections of various species.

For the academically inclined, lectures were given by Vandall King ("Almost Infinite Garnets"), Joe Peters of the American Museum of Natural History ("The Hidden Power of Gems"), Steve Okulewicz ("A Magic Show related to Geology"). The Thurstons did a show for kids of all ages entitled "Rocks in Your Head and Under Your Bed." My wife Lorraine told me the rocks in the head part described my persona accurately. She won't allow any rocks under or in our bed. Don't laugh. I heard of a collector who had rocks covering every square inch of his house, including the side of the bed his estranged wife used to occupy! Talk about sending someone a message.

Speaking of messages, I recommend you attend the New Jersey Earth Science Show in 1996. See you there!

Rochester Symposium 1995 by Jeffrey A. Scovil

The Rochester Mineralogical Symposium is always an enjoyable event. Attendees are serious mineral collectors and professionals in the field who come to hear a series of enlightening lectures, view exhibits and dine with one another in the evenings by the hotel's indoor swimming pool. Absent are the vast crowds and hoopla associated with the larger shows, and at only four days, it is no mind-melting, foot-wearying marathon. I actually have time to visit *all* of the dealers and even make a few purchases for my own collection.

The show is not the one that dealers save up all their new goodies for, but I did manage to find a few new things to include in this report. Ted Johnson of *Yankee Minerals* (22 E. Hayes Rd., E. Hampton, CT 06424) had visited Russia during the summer of 1994 and managed to pick up a flat or so of thumbnail-size **aquamarines** and **heliodors** from Cherlovaya Gora, Chita, Siberia. The site evidently has not been worked for some time, but you can dig around on the dumps and occasionally find a few beryls. It is much easier, though, to wait for the local children, who will arrive shortly after you do. They spend their spare time combing the dumps and will offer you their finds at very reasonable prices. Ted's prices reflected this, as the average specimen was only $12, sometimes with a paired aquamarine and heliodor in a single box.

Cardinal Minerals (2 Tulip Lane, Huntington, CT 06484) had several flats of some controversial material. Many collectors are familiar with the seemingly inexhaustible supply of calcite (and sometimes gypsum or aragonite) **pseudomorphs after glauberite** that came out of the Camp Verde area of Arizona for many years. The specimens are usually white to tan; but the new material is a bright turquoise blue. Many collectors are concerned about the natural origin of the coloration. I have heard a number of people swear that they are natural and others say that they are not. I examined one under a microscope and found that the surface is covered with tiny radiating groups of pale blue-green lath-shaped crystals. Mixed in amongst these groups are colorless laths of what appears to be gypsum.

A year ago at the same show, *Hawthorneden* was selling some interesting **barite** from João Pessoa, Paraíba, Brazil. This year, from the same locality they had obtained some interesting concretionary, globular to stalactitic **pyrite** groups. The pyrite had formed in open vugs with minor calcite in limestone. The largest I saw is 8 cm long.

As usual, *DeTrin-Rising Sun* (145-62 7th Ave., Whitestone, NY 11357) had some interesting new material from the former Soviet Republics. What really caught my eye were **quartz gwindels**—not from the Urals, but from the Gujivas River, Pamir, Tajikistan. This is the same locality as the Japan-law twin on the cover of the 1994 (no. 3) issue of *World of Stones* (the new Russian mineral magazine). The largest specimen they had is 18 cm across and has a very dark, gemmy smoky color.

Jim Mann of *Mountain Mann* (Box 597, Bethel, ME 04217) showed me some of what the Bennett mine, Buckfield, Maine, has recently produced: **hydroxylherderite**. These may be some of the largest crystals for the species in the U.S., with individuals to 2 cm and clusters to 15 cm. Many of the crystals are twinned and a pale yellow in color. Some have dark brown zones shaped like a bow-tie, reminiscent of the bow-tie mud inclusions in Oklahoma gypsum crystals. The Bennett mine also produced **cassiterite** crystals up to 4.4 cm, loose and on matrix. Jim then showed me a nice 1.1-cm dodecahedron of **microlite** on cleavlandite with cookeite, elbaite and lepidolite.

Dudley Blauwet of *Mountain Minerals International* seldom disappoints me when it comes to fine and new material. His specialty is Pakistan and India, but the new material I saw this time is **andorite** from the San José mine, Oruro, Bolivia. The crystals are loose, lustrous, dark gray, parallel-growth tablets up to 3.9 cm in length. They were originally collected in 1939 but held in storage until Dudley bought them recently. (He had them at the Tucson Show, but I managed to miss them somehow.)

Larry Venezia of *The Museum Piece* recently obtained a batch of Baveno-twinned **orthoclase** from the classic locality of Lake Maggiore, Baveno, Italy. The prismatic crystals to 5 cm long are of a pale "flesh" color and very inexpensive.

A recent find of **fluorapatite** from a new locality in upstate New York caused a bit of a stir among local collectors. The blue-gray prisms were found in an etched, vuggy calcite in August of 1994, in a roadcut on Theresa Oxbow Road, Moon Lake, Jefferson County, New York. Some of the crystals are broken, offset, and then frozen in the calcite. The crystals range from fairly clean and lustrous to rather rough and up to 4 cm in diameter and 17 cm long. They were originally found by Ed Brown, being sold by Phillips' *Rocky Road Minerals* (RFD 5, Box 185, Gouverneur, NY 13642).

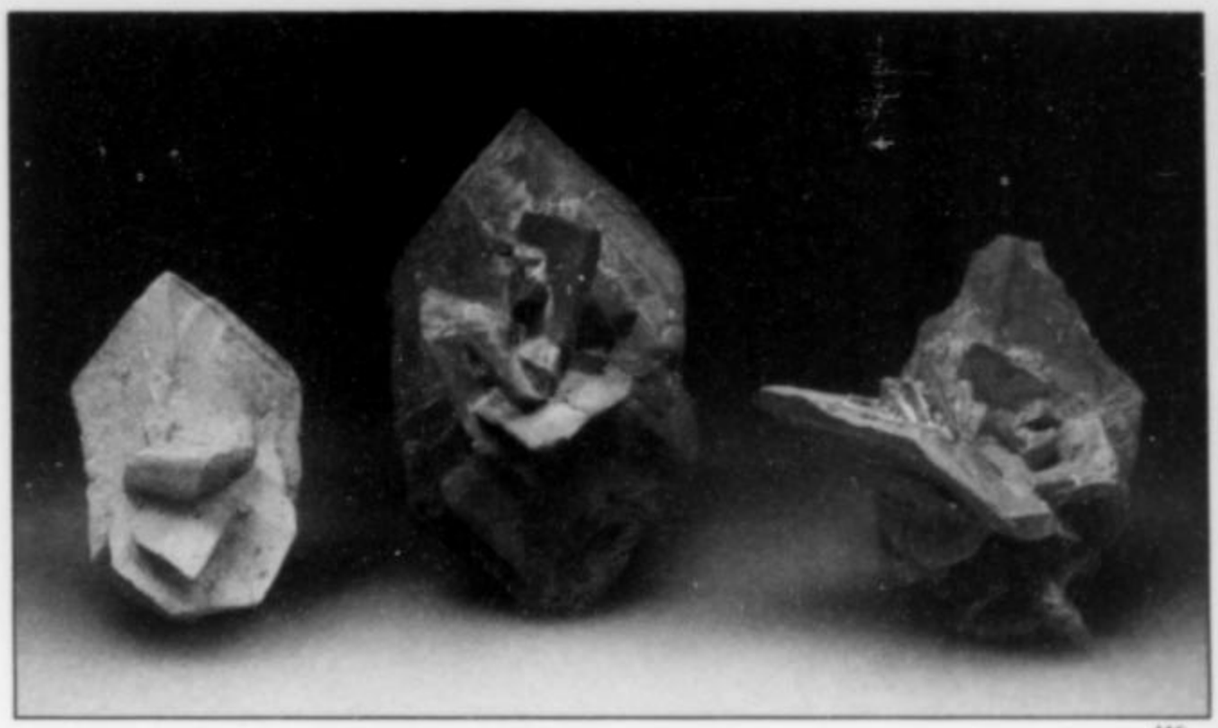

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Figure 1. **Calcite pseudomorph after glauberite, from Copper Canyon, Yavapai County, Arizona. The center crystal is 9.1 cm. *Keith Williams Minerals.***

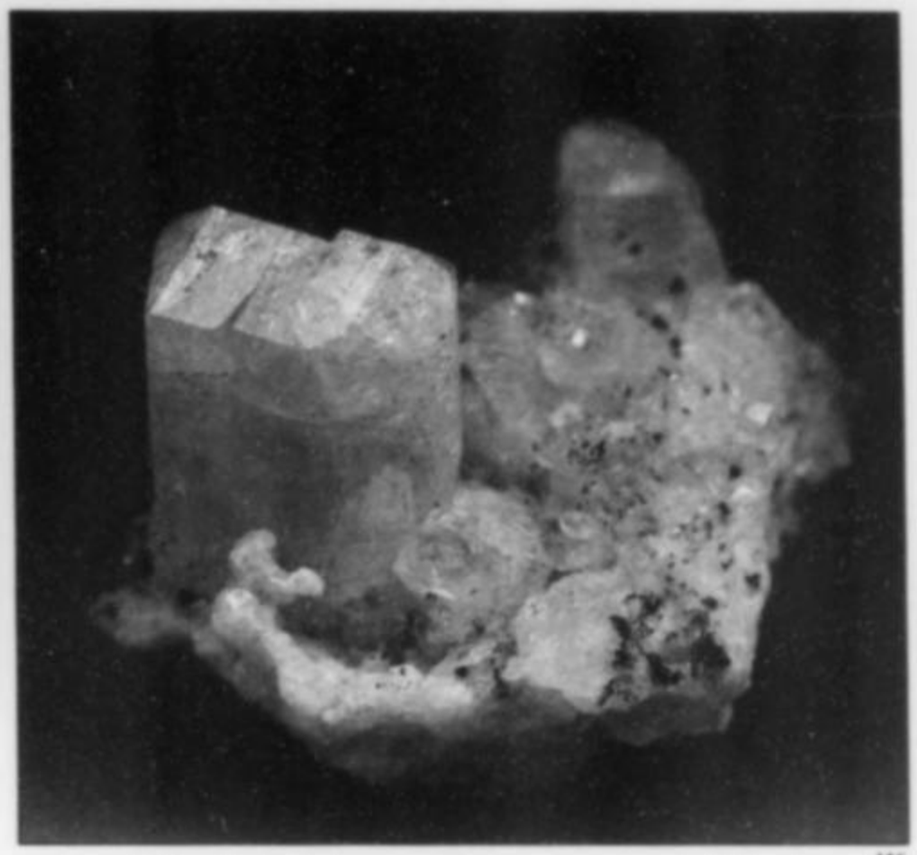

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Figure 2. **Hydroxylherderite from the Bennett mine, Buckfield, Main, 3.2 cm. *Mountain Mann* specimen.**

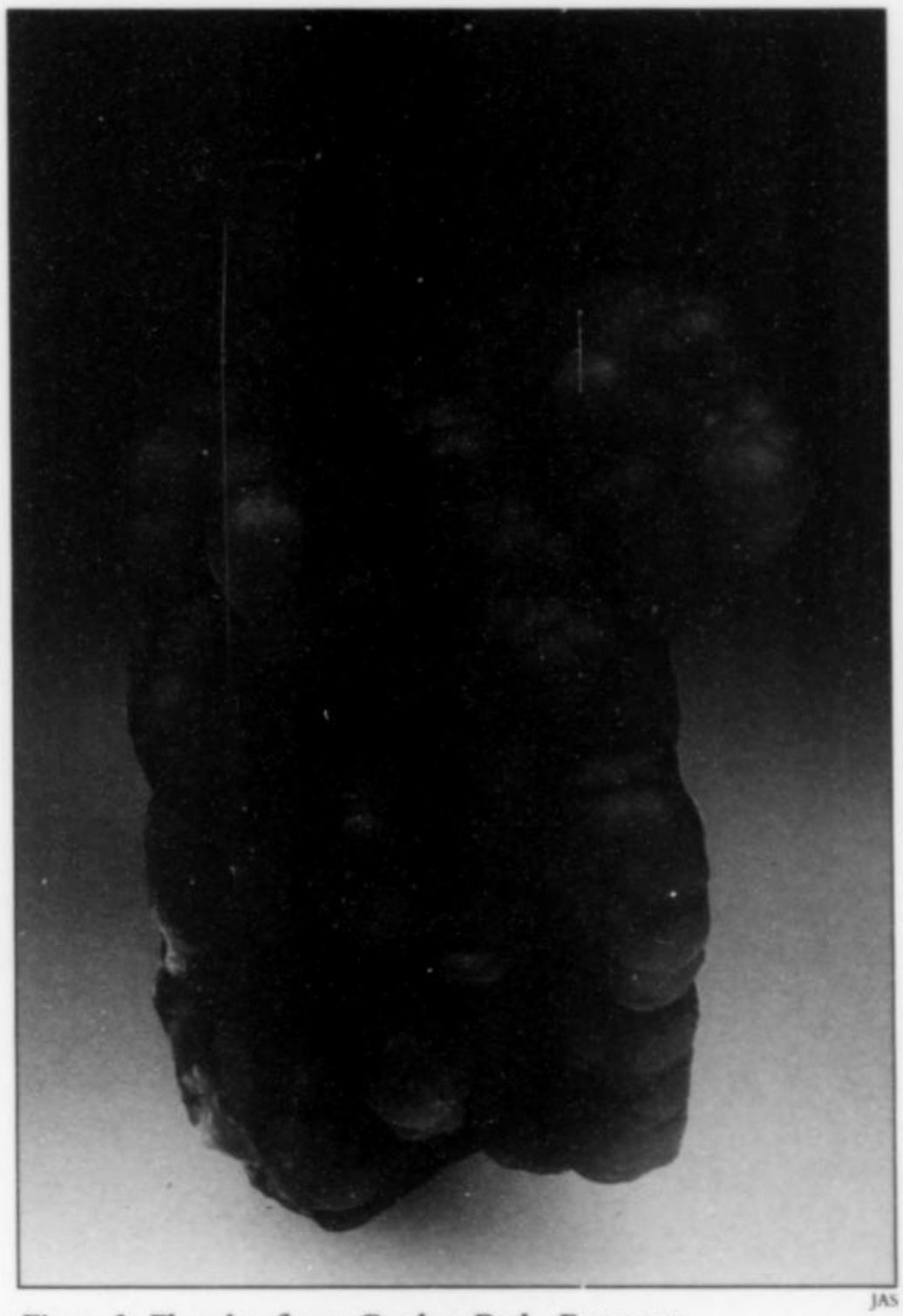

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Figure 3. **Fluorite from Garden Park, Fremont County, Colorado, 10 cm. George Witters Minerals specimen.**

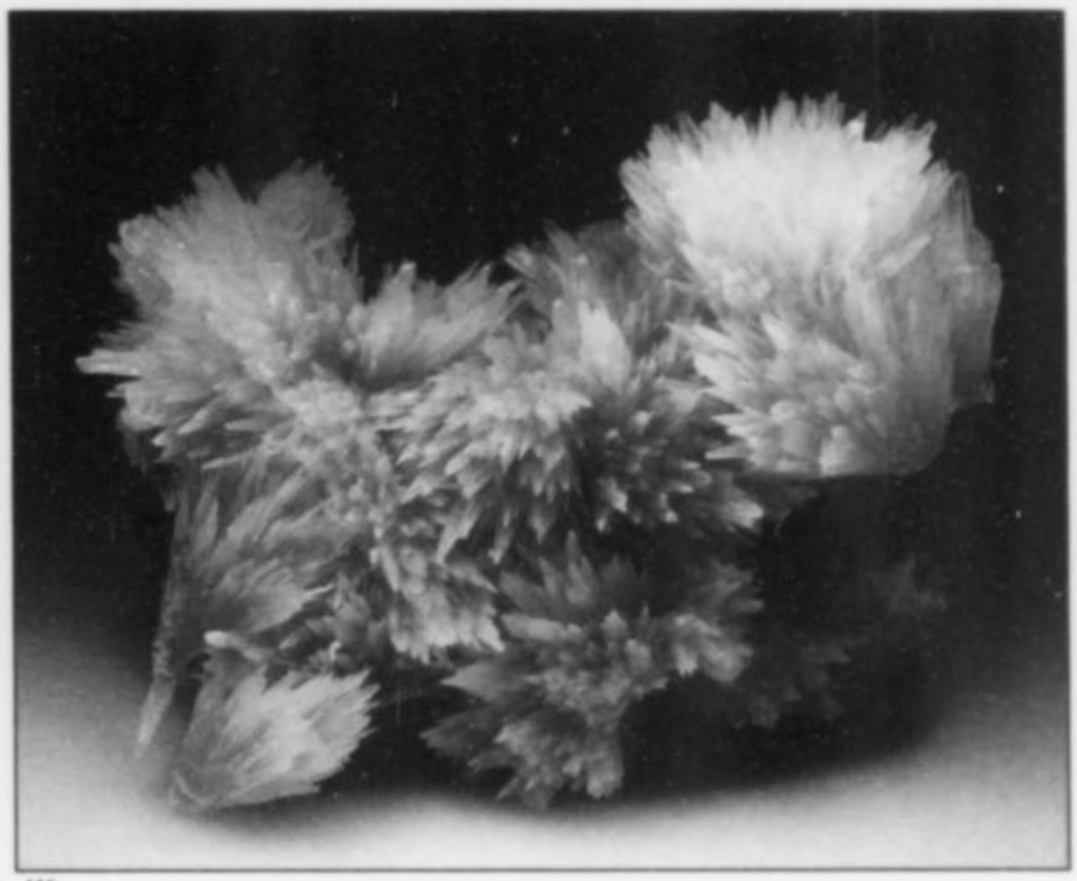

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Figure 4. **Strontianite from the Minerva #1 mine, Rosiclare Level, Hardin County, Illinois, 13.7 cm.**

JAS

Figure 5. **Barite from the Dikuluwe mine, Kolwezi, Shaba, Zaire, 4.6 cm. *Roberts Minerals* specimen.**

They also had some fluorapatite from a new, undisclosed locality in St. Lawrence County, New York, that is strong blue in color and fluoresces a bright blue.

The Goodall quarry, Sanford, Maine, was represented by many samples in the room of *John Betts Fine Minerals* (215 W. 98 Street #2F, New York, NY 10025). All John's pieces were matrix specimens, often of partial vugs with many thin to thick prisms of dark gray-green **vesuvianite** with minor **grossular** and **clinochlore**. Most of the vugs had been filled with calcite which was etched out. The material was collected in September 1994. John also had many specimens from the Millington quarry, Millington, New Jersey. This basalt quarry has produced many fine specimens of **pectolite, prehnite, fluorapophyllite, calcite, amethystine quartz, datolite, stilbite** and **pectolite**. John's fine display downstairs showed the range of minerals from this interesting locality.

Mongort Minerals continues to work the Emmons quarry in Greenwood, Maine and has been finding good material. This included pale purply pink to gray-blue **fluorapatite** in tabular to prismatic crystals to 1.5 cm across. Also found were microcrystalline **goyazite** with **hydroxylherderite** associated with quartz and altered schorl. From Mt. Mica, Paris, Oxford County, Maine, there were about 125 microcrystal specimens of **kosnarite** that came out of a single boulder. Mongort Minerals also had **perhamite** as white to tan microcrystal rosettes from the Ski Pike quarry, Cobble Hill, West Paris, Oxford County, Maine.

Brad Wilson (*Alpine Gems,* P.O. Box 352, Kingston, Ontario, Canada K7L 4W2) is a fine faceter and has joined the infamous *Coast to Coast* team. He is also a great field collector, and is responsible for the wonderful **spinel** from near McDonald Island, Northwest Territories, Canada that was the talk of the last Tucson Show. Brad had a number of them for sale at Rochester too, in a variety of sizes. The Polaris mine, Little Cornwallis Island, Northwest Territories, Canada is known for its lustrous **galena** cubes and recently produced for the first time some nice, pale yellow, scalenohedral **calcites** to 3.5 cm. Brad was selling these as well as galenas associated with sphalerite, calcite and dolomite. Brad has to be part mountain goat, because I saw photographs of another locality he has been working with Rod Tyson. It is called the Sceptre claims, near Emerald Lake, Yukon, Canada. Vugs there are on vertical cliff faces; collectors must work while dangling on ropes. Some of the pockets are big enough to crawl into, and have produced pale yellow-green prisms of **fluorapatite** to 4.5 cm long, large quartz scepters and a few sprays of schorl. One last locality Brad has been working is near Passmore, British Columbia, Canada, where he finds very gemmy Japan-law **quartz** twins up to 5 cm across.

One last dealer I would like to mention did not have anything that was really new, but had recently bought a collection of fine old classics. Two fellows—Roland Bounds (315 Stamford Dr., Newark, DE 19711) and Eric Meier (906 Prospect Ave., Wilmington, DE 19809) run *Broken Back Minerals* and got most people's vote for best name for a mineral dealer. It was a joy to enter their room and peruse the specimens that seemed so common years ago and now are just nostalgia. Included were **wulfenite** from Los Lamentos (both chopped carrots and gemmy transparent crystals); Tiger, Arizona, **wulfenite** and **cerussite**; Blanchard mine, New Mexico, **fluorites** and **galenas**; Cumberland, England, **hematite** kidney ore; **galena** from Derbyshire, England; **fluorapophyllite** from the Fairfax quarry, Virginia; Broken Hill, Australia, **cerussite**; blue-green botryoidal **willemite** from Tsumeb, Namibia; a 6.5-cm loose **stibiconite** crystal from Catorce, San Luis Potosi, Mexico, and **vanadinite** from San Carlos, Chihuahua, Mexico. I repatriated a nice Tiger wulfenite and brought a little closer to home a Los Lamentos wulfenite.

Cincinnati Show 1995 — by Jeffrey A. Scovil

[May 6–7]

Cincinnati is among the best of the midwest shows (the Cincinnati Gem-Mineral-Fossil-Jewelry Show). The show is run very efficiently by the Cincinnati Mineral Society and is a pleasure to attend.

Not being one of the country's major shows, new material is not in abundance, but there is always something to report on. For years Ross Lillie of *North Star Minerals* (5671 Drake Hollow Dr. West, West Bloomfield, MI 48322) has been the best source of material from the mines of southern Illinois. Just weeks before the show, one of the best finds of **strontianite** was made at the Minerva #1 mine on the Rosiclare level. The crystals are a pale pink in tight radiating clusters up to 4 cm long, with some of the groups being as much as 13 cm across. Many are loose groups but some are associated with **sphalerite** and **fluorite**. The fluorite is a beautiful baby-blue, making for very aesthetic specimens. Unfortunately, the blue color is not at all friendly to any film I have tried and usually reproduces as a muddy purple.

George Witters Minerals (formerly of Boulder, Colorado, now located at 5535 Miami Rd. Cincinnati, OH 45243) has maintained his Colorado connections and had some nice **fluorite** from Garden Park, near Canyon City, Fremont County, Colorado. This is not brand-new material—some came out about ten years ago—but this is a welcome resurgence. The fluorite, as grayish purple, botryoidal plates and stalactitic groups, was collected during July and August of 1994 by Don Knowles and Dan Belsher. George had plates up to 25 cm across, but most are in the small cabinet size range.

Last we come to *Minerals America* (P.O. Box 540257, Orlando, FL 32854) otherwise known as Leonard Himes. If you have ever had to take a product called Phillips' Milk of Magnesia, you probably did not wonder where the stuff came from. Well, most of it comes from the company's mine at Mt. Brusselof, Radium Hot Springs, British Columbia, Canada. The mine is in a large deposite of **magnesite** which recently produced some pretty nice *crystals* of that mineral. The crystals are flattened rhombs modified by the pinacoid, in singles up to 7.5 cm across. Leonard also had a number of subparallel aggregates in thumbnail to miniature sizes associated with quartz crystals.

Costa Mesa Show 1995 — by Jeffrey A. Scovil

[May 19–21]

Our final stop on the spring mineral show tour is Marty Zinn's *West Coast Gem & Mineral Show*, held in Costa Mesa, California. This is the biggest show on the West Coast in the spring and there is usually an abundance of new material being offered by the dealers.

I made several interesting discoveries in the hotel ballroom. *Harvey Gordon Minerals* (1002 S. Wells Ave., Reno, NV 89502) was selling a small lot of **fluorapatite** associated with **arsenopyrite** from the Julcani mine, Julcani district, Peru. The crystals, up to 2.6 cm long, are heavily striated, pale yellow prisms.

Across the aisle was *Roberts Minerals* (P.O. Box 1267, Twain Harte, CA 95383) with new **cobaltian calcite** from the Dikuluwe mine Kolwezi, Shaba, Zaire. Most of the new material is a much deeper shade of pink than what has been on the market before, in crystals up to 9 cm in length. Unfortunately, most of the crystals are loose. The few that I saw on matrix are associated with **malachite** and are much paler in color. From the same locality, Ken had for sale several fine **barites** with **malachite** inclusions. These have been around for some time, but this latest lot is of particularly fine quality and good size, with specimens in the small cabinet range.

A new occurrence of **rhodonite** has been found at Conselheiro Lafaiette, Minas Gerais, Brazil. *Luis Menezes* displayed a small selection of the material. This was the first batch obtained, and the locality shows promise of much better things to come. The specimens are made up of blocky to prismatic groups with a few free growing crystals. The color is a deep pink, and Luis says he will have better material when he can get back to the mine and collect the material himself.

The first room to visit (for me at least) is always that of *Heliodor* (P.O. Box 10, 199 00 Praha 9, Letnany, Czech Republic). Brad and Star van Scriver are known for their fine specimens from the former Soviet Republics. Brad told me that the well-known deposit of Karaoba, Kazakhstan, had been closed for some time, but was recently dewatered and is producing again. As proof, he showed me some fine octahedral **fluorites** associated with **quartz** and **pyrite**. One is even perched on top of a fine **ferberite** crystal. The old locality of Kurt Koi, Pamir Mountains, Tajikistan, still produces specimens on occasion. The one piece Brad had is a doubly terminated, green to pink **elbaite** with a **cleavelandite** "jacket." It looks for all the world like the material from Stak Nala, Pakistan.

A surprise was **datolite** from a new locality in Dal'negorsk: the *Sovietskiy mine,* which has never produced the species before. The crystals are tabular and very sharp, and heavily included with a finely disseminated green mineral. Some groups have nice **ilvaites** perched on them.

Superb **quartz gwindels** continue to come out of the northern Ural Mountains in Russia. Brad and Star had a very impressive piece that was about 30 cm across. The Sokolovskiy quarry, Rudnyy, Kustanay Oblast, Kazakhstan, has been producing very fine, orange **stellerite** groups, and has something new now. Recently, the quarry has produced some very nice, highly modified **calcite** on orange **chabazite**. The calcites are up to 6 cm in diameter, but most are less than 5 cm.

Brad has been venturing a little farther afield to Australia, and while there he came up with a brand new locality. It is the Red Dome gold mine, Chillagoe, North Queensland. They passed through a copper-rich zone in the winter and spring of 1994, and encountered some superb **cuprites**. The first I saw is a perfect, loose, very dark dodecahedron about 2 cm across. The miners and the mining company have absolutely no concept of mineral specimens, and consequently few were recovered. The ones that made it out are not in the best shape. The mine has also produced some nice **calcite** included with **malachite**, **azurite** crystals to 10 cm long, and native **copper**. The company is expanding the big pit and will soon intersect old workings dating from the turn of the century. That, plus Brad's educating the mining company about specimens and their recovery, may mean more of this material in the future. The mine is operated by Nivgini Mining Pty. Ltd., who opened the main pit in 1986 and is heap-leaching the ore. Average production runs 100,000 ounces of gold, 360,000 ounces of silver and 4,600 tons of copper per year.

Rex Harris made news recently with the announcement that his famous Violet claims in the Wah Wah Mountains of Utah were being sold to a major mining company for gem production. The transfer will not be complete until some time next year; in the meantime, Rex continues to recover fine **red beryls** from the locality. His most recent prize is a matrix group 17.9 cm across with about 25 crystals on it, the longest one being 2.5 cm.

Cal Graeber Minerals (P.O. Box 2347, Fallbrook, CA 92088) recently acquired a fine collection that had people excited. While looking it over I noticed two very fine **elbaites** from Pech, Kunar, Afghanistan, that made my mouth water. They are beautifully zoned in pastel shades of blue, green and pink. One is 8.6 cm and the other 9.6 cm in length.

The Chinese **beryl**, **cassiterite** and **scheelite** locality continues to produce its gorgeous crystals. I ran into collector Irv Brown who showed me his recent acquisition from the locality (called the Ping Wu mine, in Sichuan). It is a nice loose, tabular, pale blue beryl with a small quartz crystal attached, 5.4 cm across. A fine miniature indeed.

That is all for my spring show schedule. By the time you read this I will have been to the East Coast Gem and Mineral Show in Springfield, Massachusetts, with numerous stops along the way.

Notes from Madagascar — by Jean-Paul Weiss

Many years ago, when the huge *aepyornis* bird laid its two-gallon eggs, Madagascar was green and a lemur could cross it east to west without setting foot on the ground. Then, between 1,000 and 2,000 years ago, man came to the island and decimated the landscape with fires. During the last

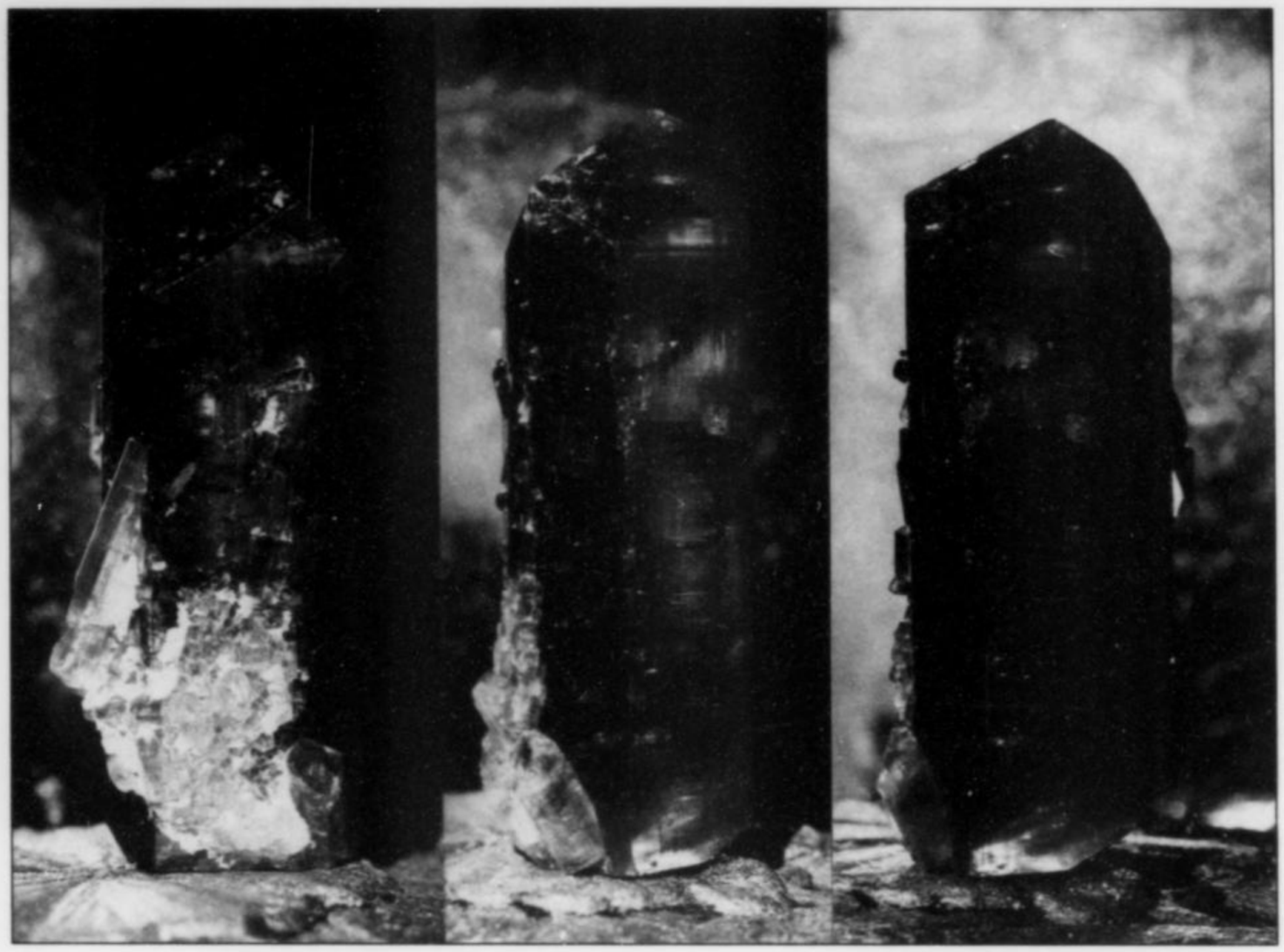

Figure 6. **Tourmaline crystal, 5.5 cm (three views), from the Sahatany Valley, Mt. Ibity, Madagascar. (Weiss collection and photo.)**

Figure 7. (below) **Phenakite crystals to 1.2 cm, on schorl, from the Anjanabonoina mine, Madagascar.**

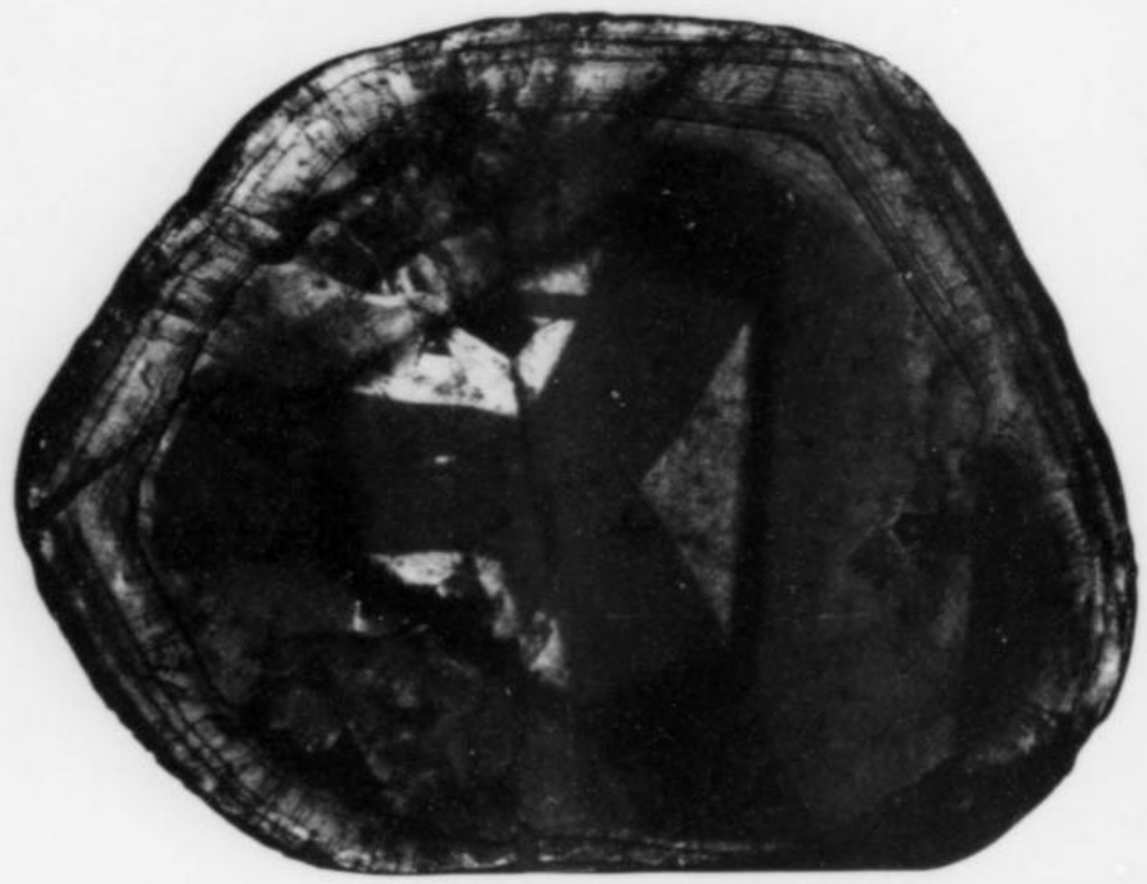

Figure 8. (above) **Tourmaline slab from Alakamisy, Madagascar. (Weiss collection and photo.)**

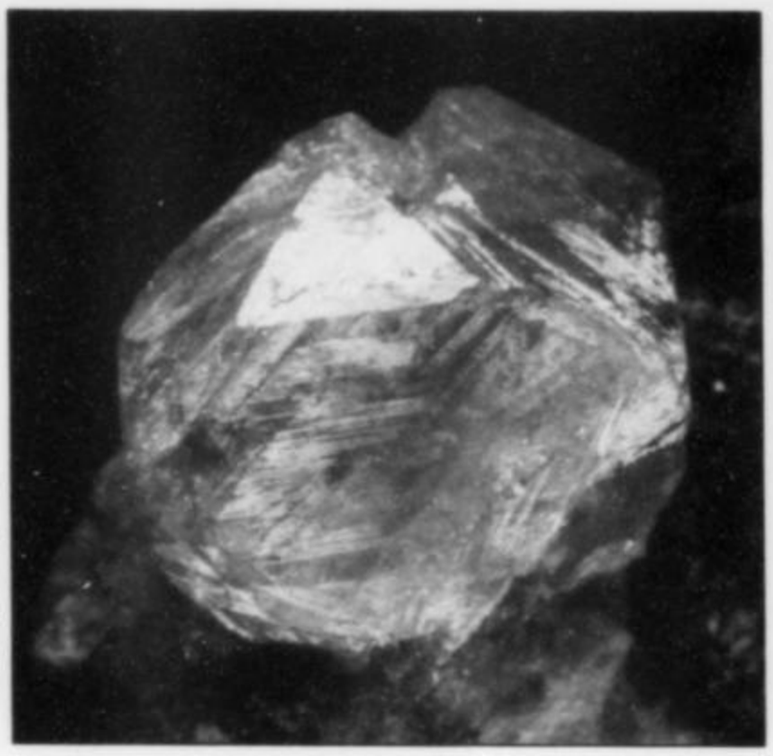

Figure 9. (right) **Rhodizite crystal, 1 cm, from Madagascar. (Weiss collection and photo.)**

century, mining has left further scars on many of the deforested mountain slopes, but from these workings a wealth of crystallized minerals emerged. Discoveries are still being made, and it will be the purpose of this correspondence to keep *Mineralogical Record* readers informed on what is happening at the source.

A small pocket found south of the Mania River has yielded a handful of fantastic colorless **tourmaline*** crystals decorated by ruby-red bands at each end. One of the crystals is doubly terminated and partially overgrown by pink tourmaline crystals and citrine quartz.

Phenakite crystals on schorl from Anjanabonoina (see vol. 20 no. 3, p. 191–200) are still offered from time to time. A rather flattened, doubly terminated, fully transparent gem crystal weighing 1.1 kg (nearly 2½ pounds!) was touring potential buyers last year.

Rhodizite used to be very scarce in Madagascar, but during the last four years the supply of single crystals and matrix specimens has been ample. However, crystals over 1.5 cm are still very rare. The color varies from transparent gray to yellow. For my own collection I am still looking for a nice yellow one in association with deep red tourmaline as reported by Alfred Lacroix from Manjaka in 1911. A fantastic specimen consisting of at least 15 rhodizite crystals (the kind never seen on matrix) on feldspar with carmine-red tourmaline crystals was offered to me recently. But my ecstasy lasted only a few seconds, before I noticed the mixture of crushed mica, sand and cement that was holding the whole thing together.

The exporting of rhodizite, hambergite and orthoclase is still prohibited despite the fact that they are being offered for sale on the local market. A new regulation which limits any tourist to a maximum export value of about $250 (one million Madagascar francs) is also hampering commerce.

Hambergite is not easy to recognize. Don't expect to find well-terminated crystals. Many parcels of purported hambergite are actually poor crystals of spodumene and albite. I was recently offered a dozen faceted "hambergites," but only two of them passed the refractometer test, the others being phenakite or quartz. This does not necessarily indicate deception by the local sellers, just lack of access to the necessary analytical tools.

Good **tourmaline** crystals for slabbing, like the famous Anjanabonoina specimens, have come from other deposits as well but are becoming increasingly scarce. One source, the Alakamisy-Itenina deposit east of Fianarantsoa, is unfortunately becoming exhausted. During the last ten years this pegmatite produced the most beautiful color combinations ever seen, surpassing even the spectacular examples from Anjanabonoina.

Five dealers from Madagascar were at the Sainte-Marie-aux-Mines Show last June in Alsace, France. Two of them were selling mainly **tourmaline** slabs in every size and color. Although the price of rough crystals has increased and their availability has declined, prices on the polished slabs seem to have remained about the same as the previous year. Slices showing the Mercedes-Benz star and triangles in red and pink sold well as usual. Yellow, green, blue and violet-colored slabs were less in demand, and thus a nice 10-cm slab with plenty of triangular color zones could be had for as little as $120. The tourmaline is predominantly from Alakamisy, Anjanabonoina (liddicoatite for sure) and Ibity, but new discoveries made in the old Laondany deposits have also yielded nice slabs of a grass-green color with a perfectly symmetrical red-orange triangle in the center. The tendency has been to present complete sets of all slices cut from a single crystal. Recently there have been more "long cuts" (parallel to the *c* axis), a technique suited to crystals which have well-stratified color zoning along the whole length of the *c* axis. Such specimens are often found these days at Alakamisy. Generally speaking, top-quality slabs are much in demand, and there seems to be no limit to the fantasy of mother nature when it comes to tourmaline. Each cut produces a unique piece of natural art, and certainly an investment worth the price.

* More than one species of tourmaline is found in Madagascar which cannot be distinguished visually; liddicoatite is among the most famous. Without a chemical analysis of typical material from a locality it will be most prudent simply to refer to the crystals as "tourmaline."

Springfield Show 1995 — by Thomas Moore

[August 11–13, 1995]

If readers can stand one more "banquet" metaphor in this space, I'll offer the remark that the Springfield Show in August makes a good appetizer for Denver's main course in September. Besides, as Springfield is the major annual East Coast show, it seems to balance Denver and Tucson in some sense. Lacking the internationalism of these (no foreign dealers at all attended this year), it is yet big enough to attract Americans from everywhere, including some interesting eastern dealers not usually seen elsewhere—I counted three here from Delaware alone.

The exhibit theme this year was *beryl*, and appropriately the chief inner motif was *New England beryl*. There were cases showing, for instance, Joel Sweet's self-collected Connecticut beryls; New England beryls from both the Harvard and Yale collections; the now-famous "rose" and "peach" morganites from the Bennet quarry, Buckfield, Maine (shown by Harvard); a whole case of the pretty pale green beryls of Royalston, Massachusetts, from the collection of Warren and Dorothy Johansson; Houston and Carnegie and University of Delaware worldwide beryls; and from the Connecticut Valley Mineral Club, more "general" beryls, but this display starring an extraordinary pale pink translucent 5 x 5 x 6-cm morganite in matrix from the old Gillette quarry near Haddam Neck, Connecticut (see the article in vol. 23, no. 1). Among other exhibits of note were a splendid small case of Italian minerals by Joe and Renée Polityka; nine assorted, large, show-stopping specimens by Russ Behnke; Laurium, Greece, minerals by Ted Johnson; two "mineral masterpiece" cases by Marvin Rausch; and two proud cases full of northeastern U.S. showpieces self-collected by members of the

Keene Mineral Club of New Hampshire (with a two-foot-wide New Hampshire cordierite crystal group with sharp blocky individuals the size of beer cans).

Among other show features were a large wholesale section, and a lecture by Bob Jones on Colombian emerald-hunting. Also, a liberal-sized snack bar and more of that ever-popular air-conditioning graced the event. Show manager Marty Zinn graced it too, with his own special "emerald store"; there were two inflexible rules: the flat price for any bright green piece of massive emerald was one dollar, and you had to be 12 or under to enter upon the transaction.

Being 12 or over myself, I can't report finding bargains quite like *that*, but I did find much of general interest:

Don Parsons (father of Doug, who was off somewhere chasing Chinese whatnots) had a new batch, dug just two weeks ago, of exceptionally nice **golden barite** from the Smith Ranch north of Wasta (the familiar "Elk Creek" locality), South Dakota. These are fine, deeply colored and gemmy, tapered prisms to 12 cm long, sticking up at all angles from drusy yellow calcite in seams in and interstices between hardened brownish mud concretions. A good lot of cabinet specimens—with matrixes to 30 cm across—was available; the star piece is a detached (unfortunately) barite crystal about 15 cm long, of matchless transparency and deepest orange/brown color throughout.

Hard-trucking *Dave Bunk* (1441 W. 46th Ave., Unit #8, Denver, CO 80211), who drives all the way here each year with boxes of rocks from the Rockies, had something quite radically impressive from Colorado: five thin, flat, miniature-sized specimens (from 3 to 5 cm wide, less than 1 cm thick) of matted **wire gold**, from the classic locality of Farncomb Hill, Breckenridge. They were the best smallish Colorado golds, and indeed I think the only Colorado *wire* golds, that I've ever seen for sale at a show. Dave further offered a few nice thumbnails of very pale yellow-orange, sharp **phenakite** crystals, mostly loose but some with adhering bits of quartz, from Mt. Antero. And there were plenty more large specimens of the sharp rhombs of "butterscotch" calcite on traprock from McMinnville, Oregon, on which I reported from Tucson '95.

Dennis Beals of *XTAL* (342 Lafayette Center, Suite 211, Manchester, MO 63011) has bravely gone mineralizing about in the wild opium-growing areas of Veracruz state, Mexico, which is also, of course, one of the world's best **amethyst**-growing areas . . . but it is *wild*; an entrepreneur (of some kind or other) was murdered there just last month, Dennis says. The prize, though, was a lot of about 100 beautiful specimens of the lovely transparent amethyst whose purple color dramatically deepens near the tapering prism tips. A few of these crystals are sceptered just where the purple is at its most royal. The best of the specimens at Springfield are 15 to 20-cm matrix-free clusters, usually consisting of from two to five large individuals, priced from $100 to $400. The locality, as precisely as it can be given, is the Piedras Parado mining area, Las Vigas, Veracruz, Mexico.

Also just back from the same country is Doug Wallace of *Mineral Search* (11882 Greenville Ave., Suite 123, Dallas, TX 75243), who's been looking into silver mineralization at the renowned Rayas (not Reyes) mine, Guanajuato, Mexico. He's also been looking into the much less familiar Sireña mine, which exploits the same orebody as the Rayas but is "administratively distinct," i.e., rival mine peoples can make like McCoys and Hatfields when underground turf issues come up as they not infrequently do. Anyway, a recently struck feeder vein of rich ore on the Sireña side has yielded some very brilliant 5-mm **acanthite** crystals of simple, sharp, cubic habit (different, that is to say, from the stacked, skeletal cuboctahedrons that are the typical Rayas specimens). The vivid little black cubes occur in shining, loosely packed swarms over massive acanthite, with lots of tiny, equally lustrous pyrite crystals mixing in too. The finest large group is a handsome, bristly, glittery thing 15 cm high ($2,000), but there are about 20 smaller pieces, down to large thumbnails. Meanwhile the Rayas mine has been producing, and Doug was offering, some outstanding thumbnails with small miniatures of **acanthite pseudomorphs after pyrargyrite**, with sharp, prismatic, hexagonal-looking shapes to 1 cm in aesthetic groups—duller-lustered, though, than the pure-blood acanthites of the Sireña.

An old-hand Ontario field collector with, to judge from what he was showing at Springfield, much promise as a new show dealer is Dan Lambert of *Lambert Minerals* (152 Colleen Cres., Ancaster, Ontario, Canada L9G 1J3). One of Dan's and his wife Shelley's most successful collecting experiences lately has been at a roadcut on Highway 28 near Hardwood Lake, Raglan Township, Renfrew County, Ontario, where large euhedral **tremolite** crystals occur, in both bladed and blocky habits, in vugs and wide seams in a dense pale green amphibolite. The tremolite is a pleasing dark blackish green with a medium glassy luster, and individual terminated blades can reach 8 cm long; blocky monoclinic forms to 2 x 2 x 3 cm can make stately-looking groups to 20 cm across. There were ample supplies of this material at Dan and Shelley's stand at Springfield, and, we're told, there should be yet more in their room in Denver.

A second Lambert Minerals paragraph must go to mention the handful of thumbnails of **ilmenite** in dull black flattened rhombs, from the "Bentley Lake Road occurrence" in Faraday Township south of Bancroft, Ontario—dug by the Lamberts last fall. In general aspect, including sharpness, these ilmenite crystals suggest and rival the classic ones from Norway, although they reach only 1.5 cm in maximum size and grow, unlike the generally anti-social Norwegian ones, in jumbled groups (originally embedded in calcite; some are naturally leached out when found).

Latest rumors from Romania concern a great walk-in pocket many meters long, solidly lined with fine **stibnite** crystals, which somebody hit about a year ago at the old Herja (formerly Kisbanya) mine at Maramures. For years the supplies of good Romanian minerals have been sporadic at best, but now, anyway, there seems to be a bit of a feast on, thanks in part to *Dan and Jill Weinrich* (16216 Copperwood Lane, Grover, MO 63040), just back from their listening post in Hungary. The stibnite specimens are very bright, metallic-black convocations of sprays of crystals to 10 cm long, a few nicely sited in cavities in a greenish cherty matrix; first-rate miniatures could be had for around $50. Another Herja mine standout is **berthierite** as loose spheres of tiny, steely gray

acicular crystals—think of a well-worn but somehow perfectly spherical Brillo pad—usually as thumbnails; larger berthierite specimens are brownish black groups of subparallel fans of compacted needles, the best of these at the Weinrich stand measuring a dramatic 17 cm.

Fine as Romanian stibnite is and can be, it was **stibnite** from China which, if anything stole it, stole this Springfield Show. I am not talking about the groups of acicular crystals that have for the past few years been coming abundantly out of the Xikuangshan mine, Hunan Province, but rather about huge, stout, thick, individual loose prisms, some gracefully bent from natural gliding, up to 30 cm long, and commonly 5 cm wide and thick. They are complexly terminated too, like the old Japanese ones, but brighter than the latter usually are; on the other hand, the Chinese upstarts are usually much damaged ("chewed" is the word that suggests itself) along edges and striation ridges. The exact locality thus far is a mystery. Dave Bunk, who had some of these steely beasts, has been told that they are simply a new strike at the Xikuangshan mine; but Danny Trinchillo of *DeTrin Minerals* (see later) had "Luayang, Leiyang Province" as the source. To their credit, neither gentleman waxes dogmatic, both admitting to being merely secondhand (at least) sources of information in this regard. So, as so often with new Chinese, Russian, Himalayan, etc. finds, we'll just have to wait and hope to see—but clearly this is a stibnite locality bidding fair to equal the Japanese one, especially if some coherent groups should appear, and if damage should lessen.

Note in passing: at least ten dealers around the show had further supplies of the very attractive, milky green chlorite-infused **heulandite** from Aurangabad, India, which I mentioned from Tucson. Some of the prettiest groups show perfect coffin-shaped heulandite crystals to 2.5 cm, these *not* all wholly greened-out but rather, many of them, part colorless/clear and part green. Chris Wright of *Wright's Rock Shop* (3612 Albert Pike, Hot Springs National Park, AR 71913) had the best I saw: four exquisite small cabinet pieces.

A truly new and greatly promising small lot of **heliodor beryl** in simple, sharp, hexagonal prisms to 3.5 cm long and/or wide was recently brought in from Tajikistan by Rob Lavinsky, and was being marketed in Springfield by Neil Pfaff. The locality given is Zelatoya Vada, Rangkul, east of Murgab, Tajikistan; there seems no real reason to think that these might in fact be from Volodarsk, Ukraine, as they're not etched at all, and as they sit smartly on a white pegmatitic matrix (some with small gray muscovite books in aesthetic beltlines). The color of the crystals is pale to medium yellow and they are *gemmy* just about all the way through, in nearly every case. The hope here is that the mysterious guerrilla wars now going on in Tajikistan, or else the misplaced priorities of the gem cutters at points of U.S. entry, do not rob us of further supplies of these lovely beryls.

As has become my habit, I'll finish off in Russia. There is, you see, a thing or two new to say about Dal'negorsk, in Primorskiy Kray, far eastern Siberia: the most prolific and, I'd say, most exciting of all the new Russian localities of post–Cold War note. Danny Trinchillo of *DeTrin Mineral Company* (145-62 7th Ave., Whitestone, NY 11357) makes regular trips to Russia, and this time returned with two more new (to me anyway) finds to add to the growing Dal'negorsk list. One is **calcite** of a new habit: loose bladed twins of thumbnail size, long and thin, with the twinning plane down the middle and a shallow re-entrant notch at the top of each crystal; he had about 50 of these from a recent pocket. In pellucid clarity and in that hard-to-describe subtly silky luster these calcites greatly resemble the best of the Cumbria, England, ones; there are no matrix pieces as yet but the little loose crystals do make wonderful thumbnails, especially for twin-fanciers. Also, the Trinchillos had a very few, very fine specimens of tetrahedrite from Dal'negorsk: modified tetrahedrons to 2 cm on edge, of a very bright metallic black with a slight iridescence on some faces. There were a couple of miniature clusters, and one fine thumbnail showing a single crystal sitting alertly up at the top of a piece of quartz/sulfide matrix.

As I'd not seen **tetrahedrite** from here before, and it seems I am *always* seeing new things from Dal'negorsk, I rechecked Mick Cooper's sketch of what's what at the locality (see his Munich report in vol. 24, no. 3), and Michal Hamat and Veronika Stědrá's full-scale article in the November-December 1992 issue of *Mineralien Welt*. Remember, if you too are trying to "keep up," that really there are two mines, and two very distinct mineralogies, adumbrated by "Dal'negorsk" on the labels. One is an open-pit boron mine (responsible in 1992 for the greater part of the boron production of all Russia), in whose fringing silicate skarn are found the remarkable specimens of non-metallic species like datolite, axinite, danburite, ilvaite—plus a so-far little-known but beautiful tabular orange calcite. Then, across a narrow valley, these is the big lead/zinc/copper orebody exploited by the Nikolai (or Nikolaevskiy) mine, and from here come the splendid specimens of metallic ore minerals (galena, sphalerite, pyrrhotite, chalcopyrite), as well as equally wondrous gangue specimens of ice-clear and green fluorite, and calcites of many moods. Tetrahedrite in good crystals from the Nikolai is not mentioned in the 1992 German article, which does attempt a complete list of noteworthy species, so one might suppose that we have here another new find. I'll not try to direct traffic among the conflicting rumors I've heard regarding how close "Dal'negorsk" is to closure as a commercial mine, and hence as a specimen source; with sufficient experience in these things and but little imagination, collectors can make up their own rumors in their own armchairs. I do opine and repeat, though, that Dal'negorsk is the most exciting of all the earth's mineral-specimen sites at their peaks of production just now (Mont Saint-Hilaire alone excepted); and take note that extensive suites of its very best things, including ongoing surprises, are not at all hard to gather around the show circuit. With which optimistic remark I will leave you until Denver Show report time.

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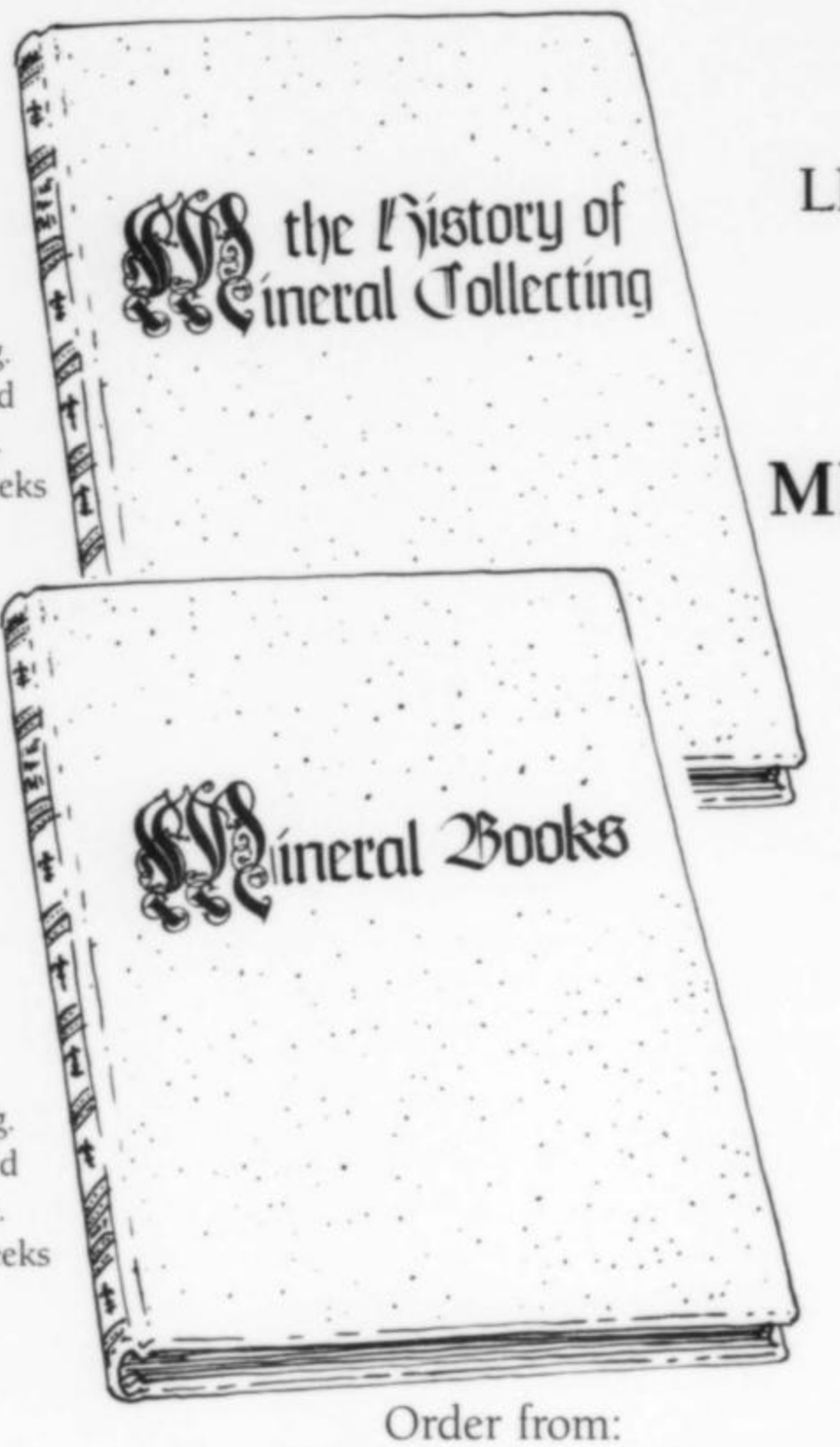

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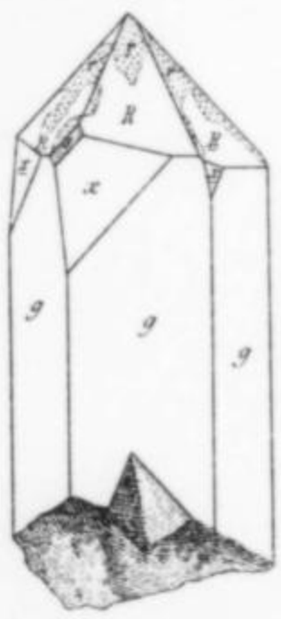

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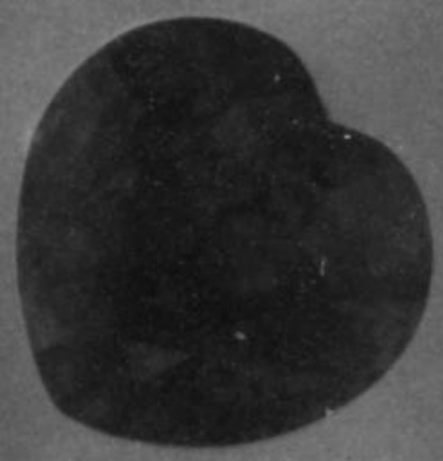

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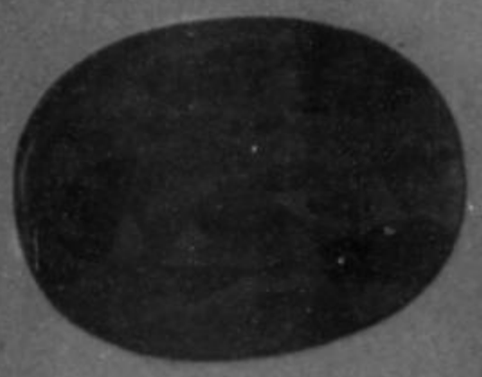

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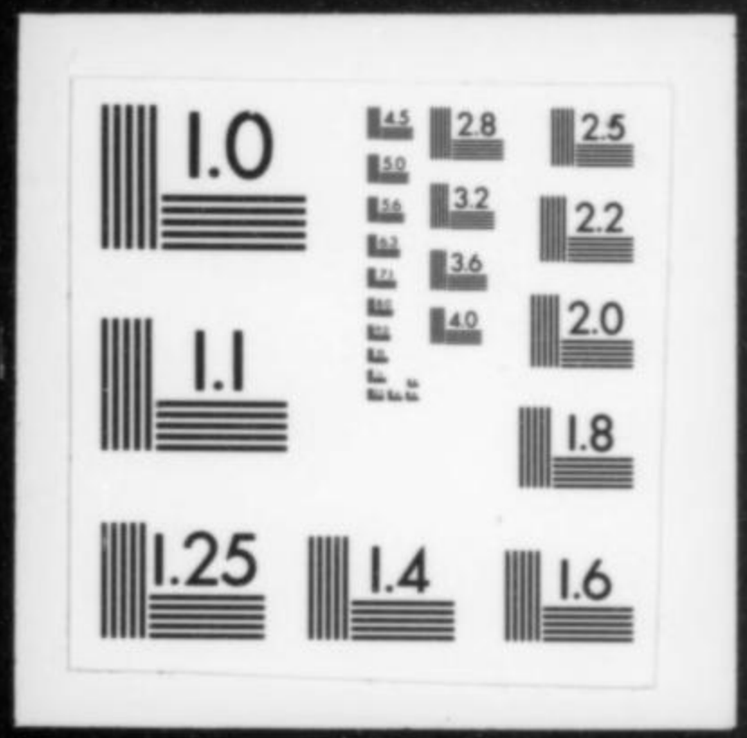
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