

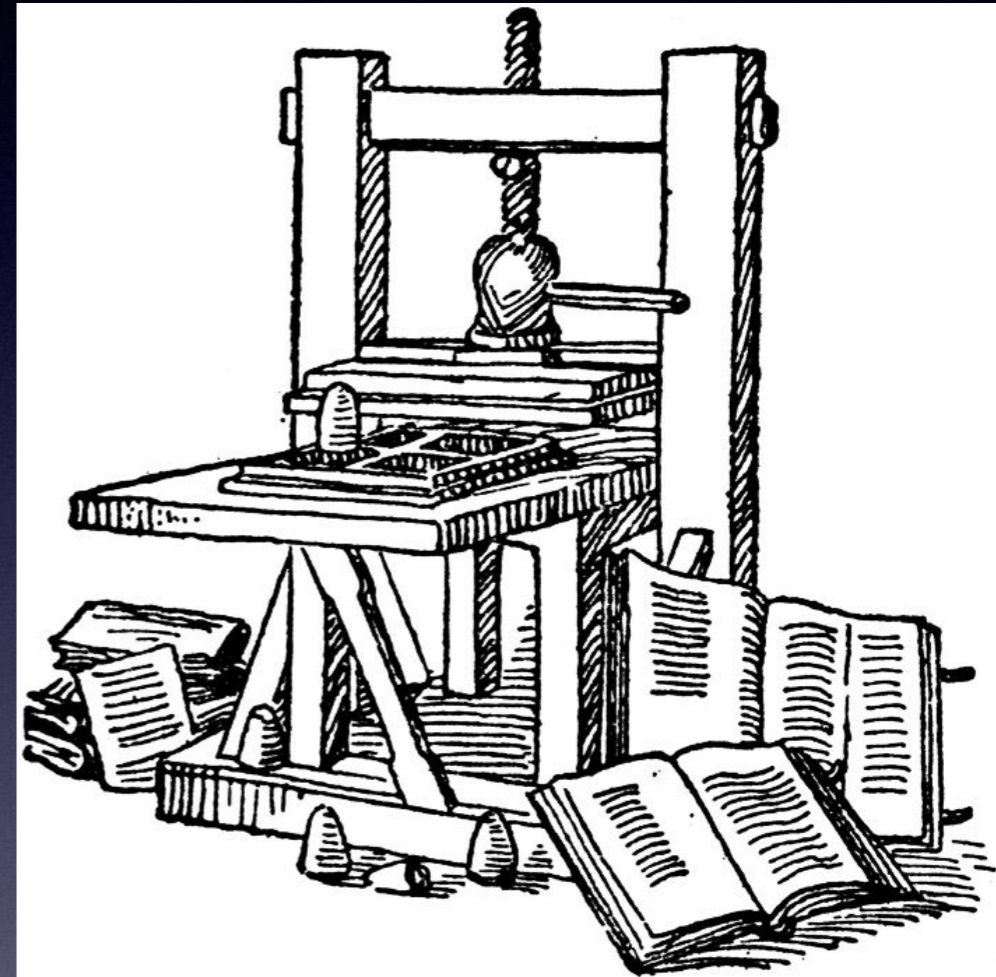
mindat.org and the future
of mineral information
publishing

by Jolyon Ralph, mindat.org

A brief history of mineral information publishing

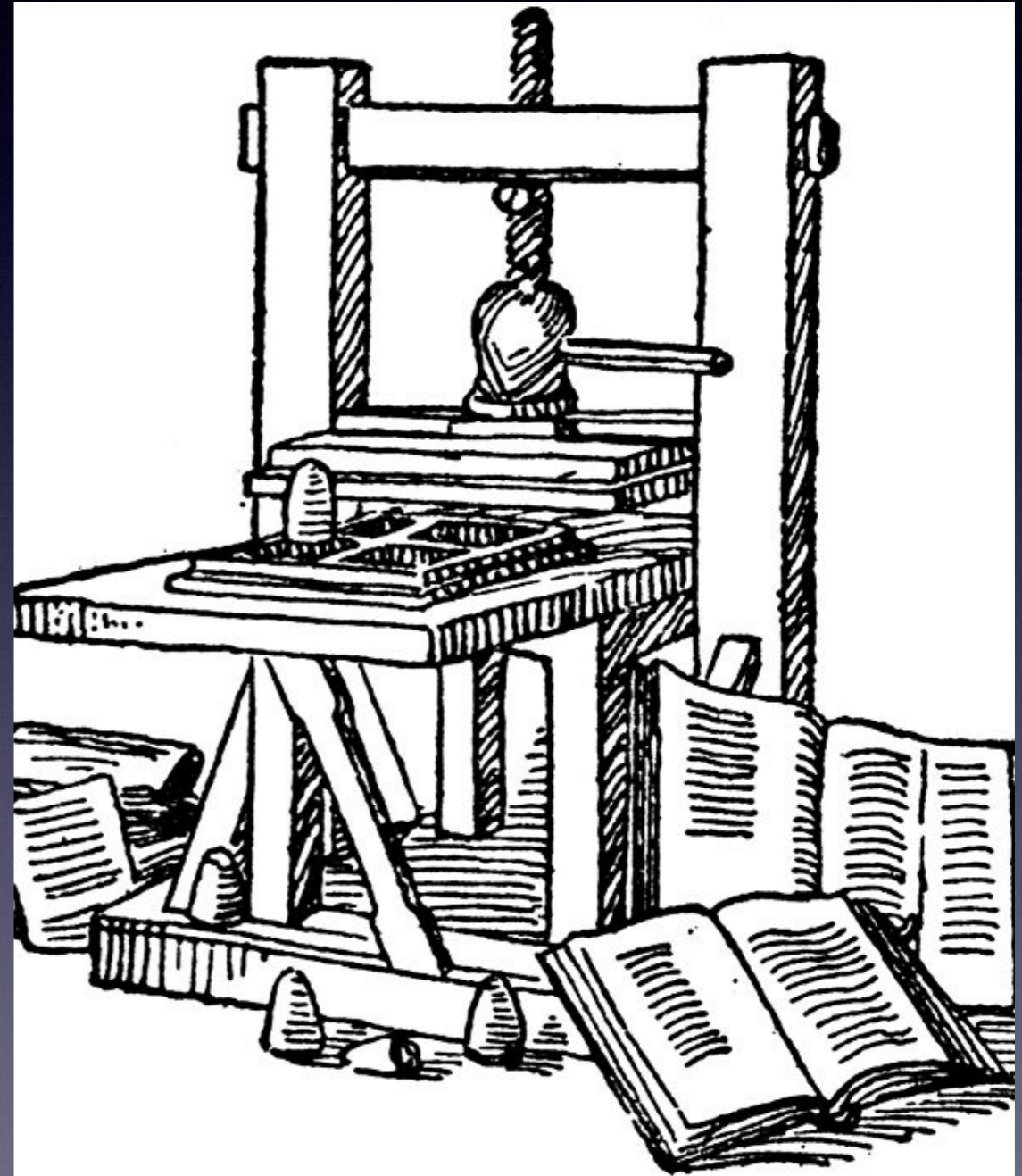
The Printing Press

~1450



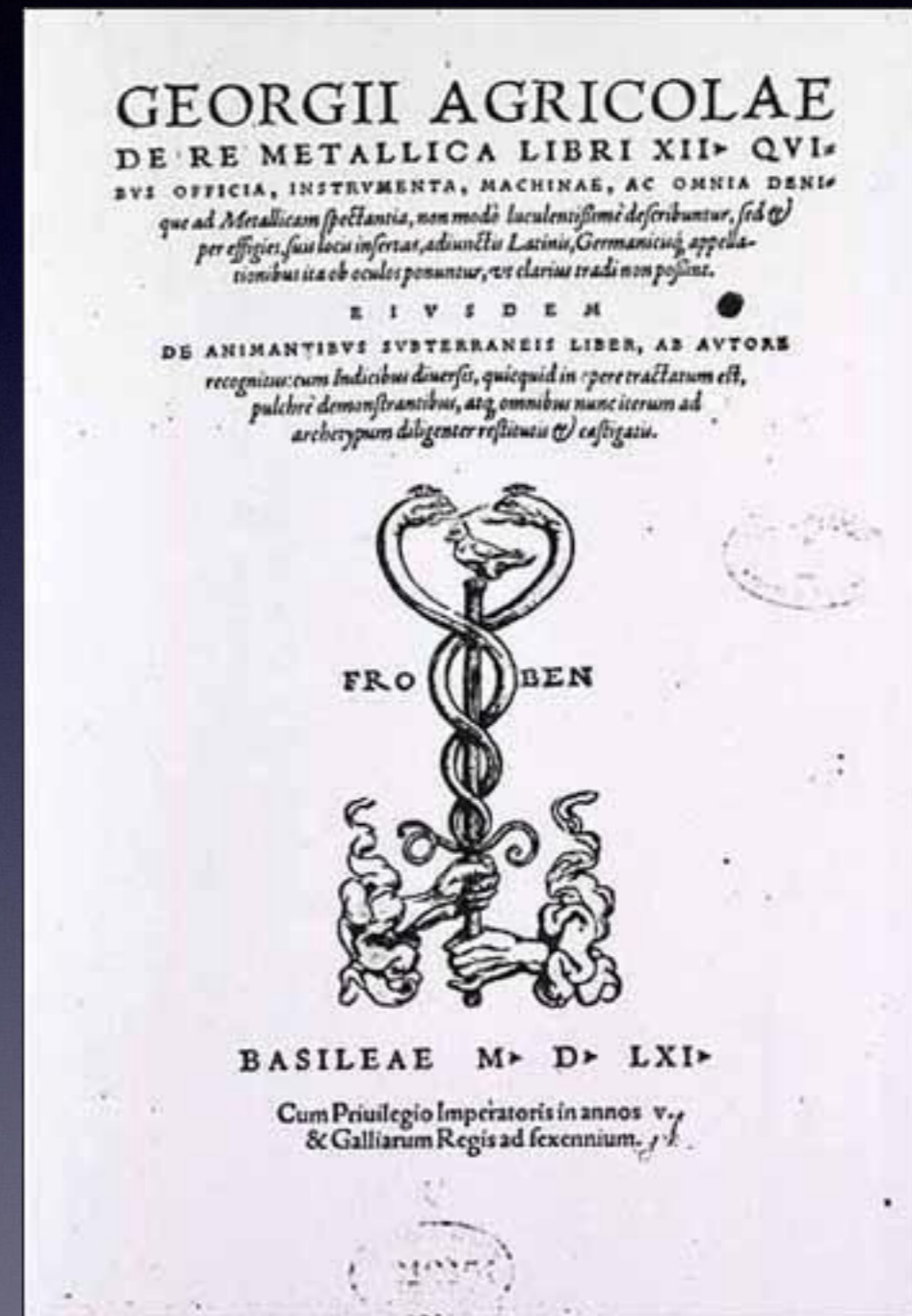
The Printing Press

- Invented by Gutenberg
- ~ 1450
- Information could be distributed cheaper than ever before



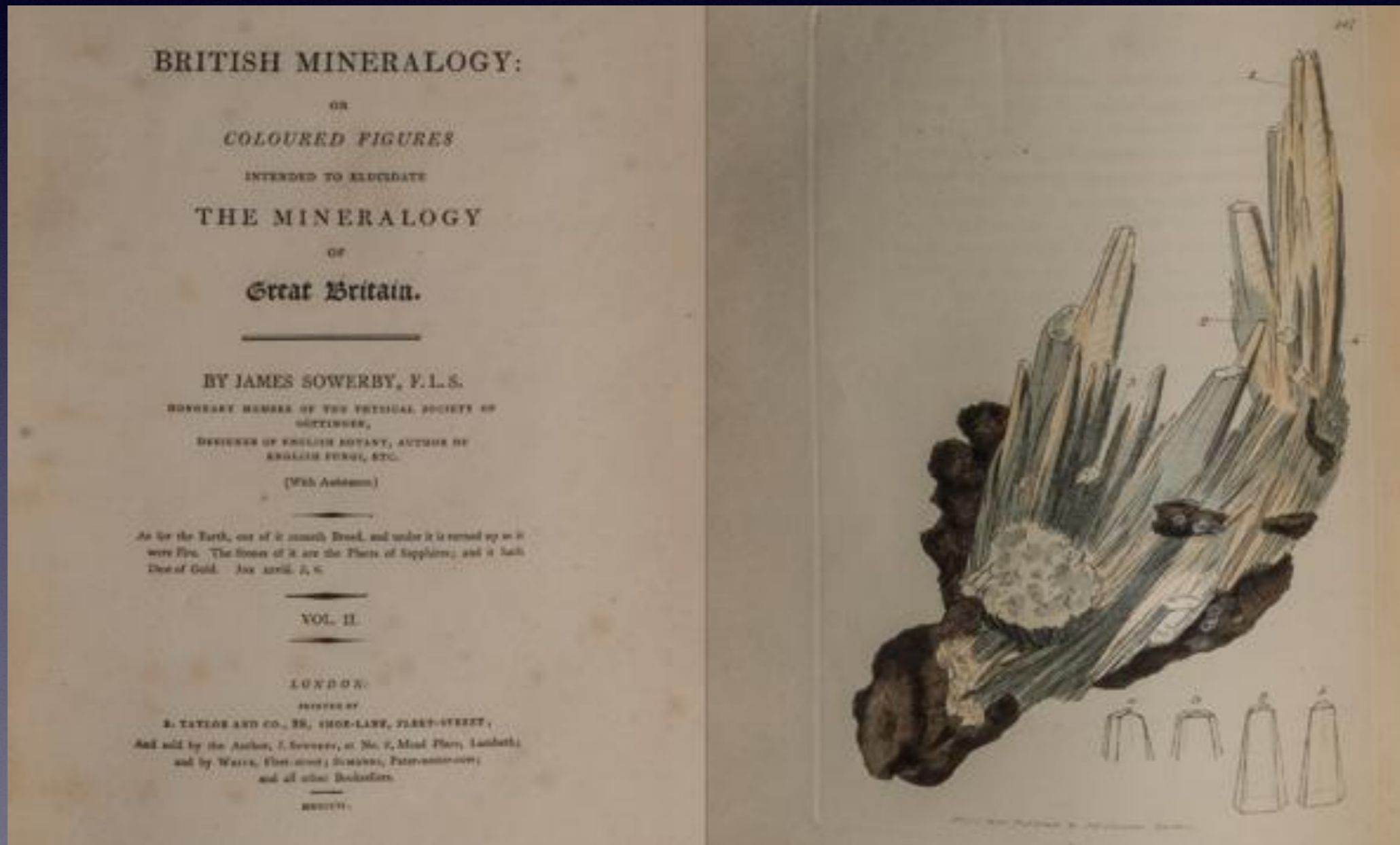
Mineral Books

- Books on minerals and mining followed
- 1556 De Re Metallica first book on mining



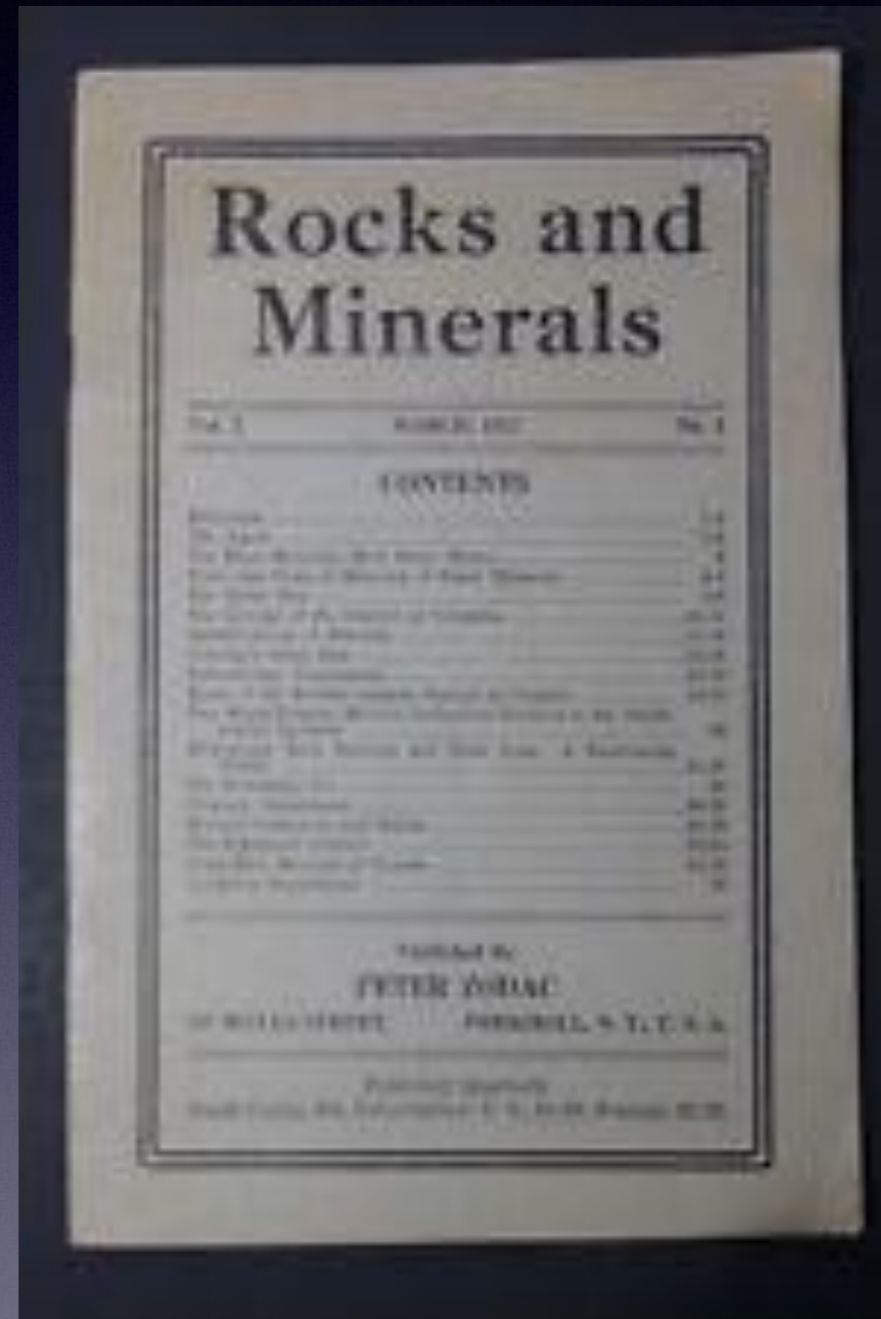
Partwork Publications

James Sowerby, British Mineralogy 1802-1817



Mineral Magazines

- Rocks and Minerals magazine published since 1926
- Now many other regular mineral magazines



The World Wide Web

Sir Tim Berners-Lee, 1993



Welcome to Mindat.org

Newest Minerals

- Little Falls Diamond
- Middleville Diamond
- Cape May Diamond
- Binghamite
- Arkansas Candle
- Sceptre Quartz
- Apricotine
- Blue Jasper
- Blood Jasper
- Bloodstone

Mindat.org is probably the largest mineralogical reference on the internet. Currently there are 7611 different minerals, varieties and synonyms listed, and information on 18355 mineral occurrences worldwide, from 5336 different sites! You can help - register and add in the information on your new local sites.

How to use this site: Just type in the name, or part of name (eg 'cupro'), into the mineral or locality box below, and click the 'Go' button

Mineral Dealers want to see your site promoted on here? Let mindat.org use your mineral photographs and you get free links and credits in return - contact jolyon@mindat.org for more information.

Newest Localities

- Cape May, New Jersey, USA
- Nipomo, California, USA
- Ojo Laguna, Chihuahua, Mexico
- Schmidtmanshall, Aschersleben, Germany
- Ilmen Mts, Russia
- Andilamena, Toamquina, Madagascar.
- Lane's Quarry, Westfield, Massachusetts, USA



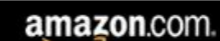
Search for a mineral

Enter name, or part of name.

Search for a locality

Enter name, or part of name.

Search by keywords:



Chemical Index of Minerals Groups

- 1 Elements and alloys
- 2 Carbides, nitrides, silicides and phosphides
- 3 Sulphides, selenides, tellurides, arsenides and bismuthides
- 4 Oxysulphides
- 5 Sulphosalts - sulpharsenites, sulphantimonites and sulphobismuthites
- 6 Sulphosalts - sulphostannates, sulphogermanates, sulpharsenates, sulphantimonates, sulphovanadates and sulphohalides

- 17 Silicates containing other anions
- 18 Niobates and tantalates
- 19 Phosphates
- 20 Arsenates
- 21 Vanadates
- 22 Phosphates, arsenates or vanadates with other anions
- 23 Arsenites
- 24 Antimonates and antimonites
- 25 Sulphates
- 26 Sulphates with halide
- 27 Sulphites, chromates, molybdates

Photographs



Scolecite
© 2001 John H. Betts



Cassiterite
© 2001 John H. Betts



Topaz
© 2001 John H. Betts



Kunzite
© 2001 John H. Betts



Benitoite
© 2001 John H. Betts



Aquamarine
© 2001 John H. Betts

mindat.org

October 2000

Advantages of Online

- Free to access
- Available on computer, tablet, phone
- Updated every day
- 100x more data than magazines
- Easily searchable

Advantages of Print

- Paid for content
- Do not need internet
- More detailed and comprehensive articles
- Long-term storage
- Physical items more desirable

Both Print & Web can die



MinMax
Mineral Information System

MinMax Minerals Localities Deutsch

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Find Locality
Go!

Find Mineral
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MinMax News

- **Editing own images**
Now every author can edit his/her images.
- **New: Mineral Determination**
Publish your unknown minerals on MinMax and let other users identify it!
- **New: Mineral Photo Gallery**

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The Open Content Community for Rockhounds. [What is MinMax?](#)

localities: comments

Pezinok mine closed
Peziok (Bösling) (Europe with Ural Mtns. - Slovakia)
Locality type incorrectly states that the mine is active. The Pezinok Antimonit mine was closed in the last decade of the 20th century.

pursuit exaxct site
Prickler Halt (Europe with Ural Mtns. - Austria)
...terrain gets somewhat plainer (ca. 160 height-m); the woods get lower here. Here a narrow, in part very indistinct path, follow it horizontally in both direction: nearly under the path there are...

pursuit exact site
Oberleidenberg (Europe with Ural Mtns. - Austria)
...places up and down the slope.

pursuit of exact site
Hirschengrube am Schwarzeck (Europe with Ural Mtns. - Germany)
..."Am Waldwiesmarterl" (figure of Christ). This point can also be reached from Schwarzenbach in the Lamer Winkel, but with larger difference of height. Hold to SE, after ca. 300m on Kaitersberg-Hö...

pursuit exact site
Quarzgrube Poschingerhütte im Rauchloch (Europe with Ural Mtns. - Germany)

New Localities

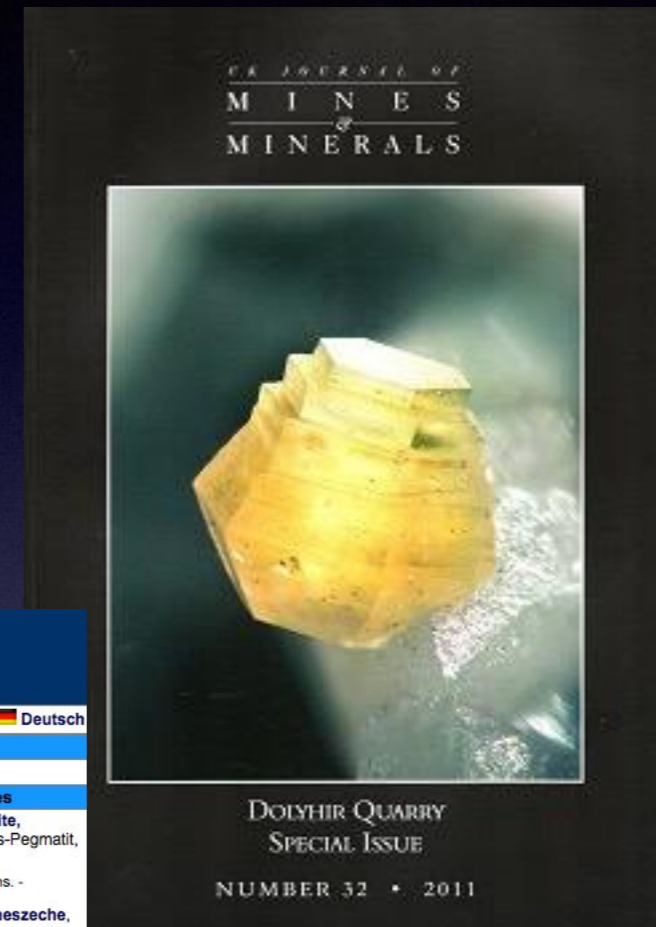
- **Hubertus pegmatite, Böbrach**, Hubertus-Pegmatit, Böbrach
Europe with Ural Mtns. - Germany
- **Gottesgabe, Kanneszeche**, Gottesgabe & Kanneszeche
Europe with Ural Mtns. - Germany
- **Eiserner Hut Silberberg**
Europe with Ural Mtns. - Germany

New Minerals

- **Abramovite**
- **Waterhouseite**
- **Tsepinite-Sr**

New mineral photos

Pyromorphite



Co-operation

- Out of print issues available online
- Short articles online, deeper versions in print
- Online indexes of articles in different magazines
- Electronic download (paid) of recent issues

mindat.org and magazines

- Live show reports
- Video
- Encourage more new article authors
- Build an index of ALL mineral magazine articles
- Conferences such as this

Other New Developments

- Mindat.org is now a 501(c)(3) not-for-profit
- Directory of mineral shows
- Ultra-high resolution images
- New Chemical Elements section

The Chemical Elements and Mineralogy

The periodic table of the elements. Click on an element to find out details about this element and related mineralogy. Elements in a darker shade of grey are not found in natural minerals but some may be found in trace amounts in the Earth.

1 Scandium Sc																	2 He								
3 Li		4 Be																		5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na		12 Mg																		13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr								
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe								
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn								
87 Fr	88 Ra	89 Ac	104 Rd	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo								
		58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu										

The Mineralogy of Arsenic

General Properties

Symbol:	As
Atomic Number:	33
Standard atomic weight (A_r):	74.92160(2)
Electron configuration:	[Ar] 3d ¹⁰ 4s ² 4p ³

Photos



< Ultrapure metallic arsenic under argon >

Atomic Properties

Electronegativity (Pauling scale):	2.18
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Element association of Arsenic in the Mineral World

This table compares the known valid mineral species listed with Arsenic and the other elements listed based on the official IMA formula. Note that unlike other sections on this page this includes non-essential elements.

The first data column contains the total number of minerals listed with Arsenic and the element listed for that row.

The second data column lists this number as a percentage of all minerals listed with Arsenic.

The final data column compares this percentage against the percentage of all minerals that contain the element listed in each row.

Click on a heading to sort.

Element	Valid Minerals listed with element and Arsenic	% of As minerals	Relative to % in all minerals
Oxygen	424 minerals with As and O	69.06%	15.16% lower
Hydrogen	346 minerals with As and H	56.35%	1.70% lower
Sulfur	155 minerals with As and S	25.24%	21.23% higher
Copper	151 minerals with As and Cu	24.59%	84.25% higher
Iron	134 minerals with As and Fe	21.82%	10.27% lower
Calcium	113 minerals with As and Ca	18.40%	29.81% lower
Lead	106 minerals with As and Pb	17.26%	69.19% higher

Relative Frequency

Comparing the ratio of the number of mineral species listed with each element + As with the ratio of all minerals listed with the element shows us which elements have a closer association with As. See the 'Element Association' table to view raw data.

Show/hide current element

1																	2										
H																	He										
3	4																	5	6	7	8	9	10				
Li	Be																	B	C	N	O	F	Ne				
11	12																	13	14	15	16	17	18				
Na	Mg																	Al	Si	P	S	Cl	Ar				
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36										
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr										
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54										
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe										
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86										
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn										
87	88	89	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118										
Fr	Ra	Ac	Rd	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Uut	Fl	Uup	Lv	Uus	Uuo										
														58	59	60	61	62	63	64	65	66	67	68	69	70	71
														Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
														90	91	92	93	94	95	96	97	98	99	100	101	102	103
														Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Key

- Lower ratio of As minerals with element
- No minerals with element and As
- Average ratio As minerals with element
- Higher ratio of As minerals with element

Localities with greatest number of different Arsenic mineral species



- | | | |
|----------|---|-----------------------|
| 1 | Tsumeb Mine (Tsumcorp Mine), Tsumeb, Otjikoto Region (Oshikoto), Namibia | 96 As minerals |
| 2 | Clara Mine, Rankach valley, Oberwolfach, Wolfach, Black Forest, Baden-Württemberg, Germany | 89 As minerals |
| 3 | Jáchymov (St Joachimsthal), Jáchymov District (St Joachimsthal), Krušné Hory Mts (Erzgebirge), Karlovy Vary Region, Bohemia (Böhmen; Boehmen), Czech Republic | 74 As minerals |
| 4 | Johann Mine, Burgfelsen, Wittichen, Schenkenzell, Black Forest, Baden-Württemberg, Germany | 68 As minerals |
| 5 | Anton Mine (St. Anton Mine), Heubach Valley, Wittichen, Schenkenzell, Black Forest, Baden-Württemberg, Germany | 68 As minerals |
| 6 | Sterling Mine, Sterling Hill, Ogdensburg, Franklin Mining District, Sussex Co., New Jersey, USA | 59 As minerals |
| 7 | Lengenbach Quarry, Fäld (Imfeld; Im Feld; Feld), Binn Valley, Wallis (Valais), Switzerland | 54 As minerals |
| 8 | Långban, Filipstad, Värmland, Sweden | 52 As minerals |

And finally...

- 1st Mindat Conference (2011) - Poland
- 2nd Mindat Conference (2012) - Morocco
- 3rd Mindat Conference (2014) - Madagascar
- 4th Mindat Conference (2016) - ????????

And finally...



Thank you!

Questions?