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GEORGIUS AGRICOLA

DE RE METALLICA

TRANSLATED FROM THE FIRST LATIN EDITION OF 1556

with

Biographical Introduction, Annotations and Appendices upon
the Development of Mining Methods, Metallurgical
Processes, Geology, Mineralogy & Mining Law
from the earliest times to the 16th Century

BY

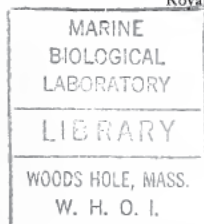
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schist, marble, and also in stone which easily melts in fire of the second degree, and which is sometimes so porous that it seems completely decomposed. Lastly, gold is found in pyrites, though rarely in large quantities.

When considering silver ores other than native silver, those ores are

ARSENICAL MINERALS. Metallic arsenic was unknown, although it has been maintained that a substance mentioned by Albertus Magnus (*De Rebus Metallicis*) was the metallic form. Agricola, who was familiar with all Albertus's writings, makes no mention of it, and it appears to us that the statement of Albertus referred only to the oxide from sublimation. Our word "arsenic" obviously takes root in the Greek for orpiment, which was also used by Pliny (XXXIV, 56) as *arrhencicum*, and later was modified to *arsenicum* by the Alchemists, who applied it to the oxide. Agricola gives the following in *Bermannus* (p. 448), who has been previously discussing realgar and orpiment:—"Ancon: Avicenna also has a white variety. *Bermannus*: I cannot at all believe in a mineral of a white colour; perhaps he was thinking of an artificial product; there are two which the Alchemists make, one yellow and the other white, and they are accounted the most powerful poisons to-day, and are called only by the name *arsenicum*." In *De Natura Fossilium* (p. 219) is described the making of "the white variety" by sublimating orpiment, and also it is noted that realgar can be made from orpiment by heating the latter for five hours in a sealed crucible. In *De Re Metallica* (Book X.), he refers to *auripigmentum facticum*, and no doubt means the realgar made from orpiment. The four minerals of arsenic base mentioned by Agricola were:—

<i>Auripigmentum</i> ..	<i>Opement</i> ..	Orpiment (As ₂ S ₃) ..	Orpiment
<i>Sandaraca</i>	<i>Rosgeel</i> ..	Realgar (As S) ..	Realgar
<i>Arsenicum</i>	<i>Arsenik</i> ..	Artificial arsenical oxide	White arsenic
<i>Lapis subrutilus atque</i> .. <i>splendens</i>	<i>Mistpuckel</i> ..	Arsenopyrite (Fe As S)	*Mispickel

We are somewhat uncertain as to the identification of the last. The yellow and red sulphides, however, were well known to the Ancients, and are described by Aristotle, Theophrastus (71 and 89), Dioscorides (v, 81), Pliny (XXXIII, 22, etc.); and Strabo (XII, 3, 40) mentions a mine of them near Pompeiopolis, where, because of its poisonous character none but slaves were employed. The Ancients believed that the yellow sulphide contained gold—hence the name *auripigmentum*, and Pliny describes the attempt of the Emperor Caligula to extract the gold from it, and states that he did obtain a small amount, but unprofitably. So late a mineralogist as Hill (1750) held this view, which seemed to be general. Both realgar and orpiment were important for pigments, medicinal purposes, and poisons among the Ancients. In addition to the above, some arsenic-cobalt minerals are included under *cadmia*.

IRON MINERALS.

<i>Ferrum purum</i> ..	<i>Gedigen eisen</i> ..	Native iron	*Native iron
<i>Terra ferria</i>	<i>Eisen ertz</i> ..		
<i>Ferri vena</i>	<i>Eisen ertz</i> ..		
<i>Galenae genus tertium</i> <i>omnis metalli</i> <i>inanissimi</i>	<i>Eisen glantz</i> ..	Various soft and hard iron ores, probably mostly hematite ..	Ironstone
<i>Schistos</i>	<i>Glasköpfe</i> oder <i>blütstein</i> ..		
<i>Ferri vena jecoris</i> <i>colore</i>	<i>Leber ertz</i> ..	Part limonite ..	Iron rust
<i>Ferrugo</i>	<i>Rüst</i>		
<i>Magnes</i>	<i>Siegelstein</i> oder <i>magnet</i> ..	Magnetite	Lodestone
<i>Ochra nativa</i>	<i>Berg geel</i> ..	Limonite	Yellow ochre or ironstone
<i>Haematites</i>	<i>Blüt stein</i> ..	Part hematite .. Part jasper	Bloodstone or ironstone
<i>Schistos</i>	<i>Glas köpfe</i> ..		
<i>Pyrites</i>	<i>Kis</i>	Part limonite.. ..	Ironstone
<i>Pyrites argenti coloris</i>	<i>wasser</i> oder <i>weisser kis</i> ..	Pyrites	Pyrites
<i>Misy</i>	<i>Gel atrament</i> ..	Marcasite	*White iron pyrites
<i>Sory</i>	<i>Graw und</i> <i>schwarz atrament</i>	Part copiapite ..	<i>Misy</i> (see note on p. 573)
<i>Melanteria</i>	<i>Schwartz und</i> <i>grau atrament</i>	Partly a decomposed iron pyrite	<i>Sory</i> (see note on p. 573)
		Melanterite (native vitriol)	<i>Melanteria</i> (see note on p. 573)

The classification of iron ores on the basis of exterior characteristics, chiefly hardness and