T.C.
Ankara Üniversitesi
Mühendislik Fakültesi
Jeoloji Mühendisliği Bölümü

JEM 227
GEMOLOJİ

Dr. Öğr. Üyesi Kıymet DENİZ

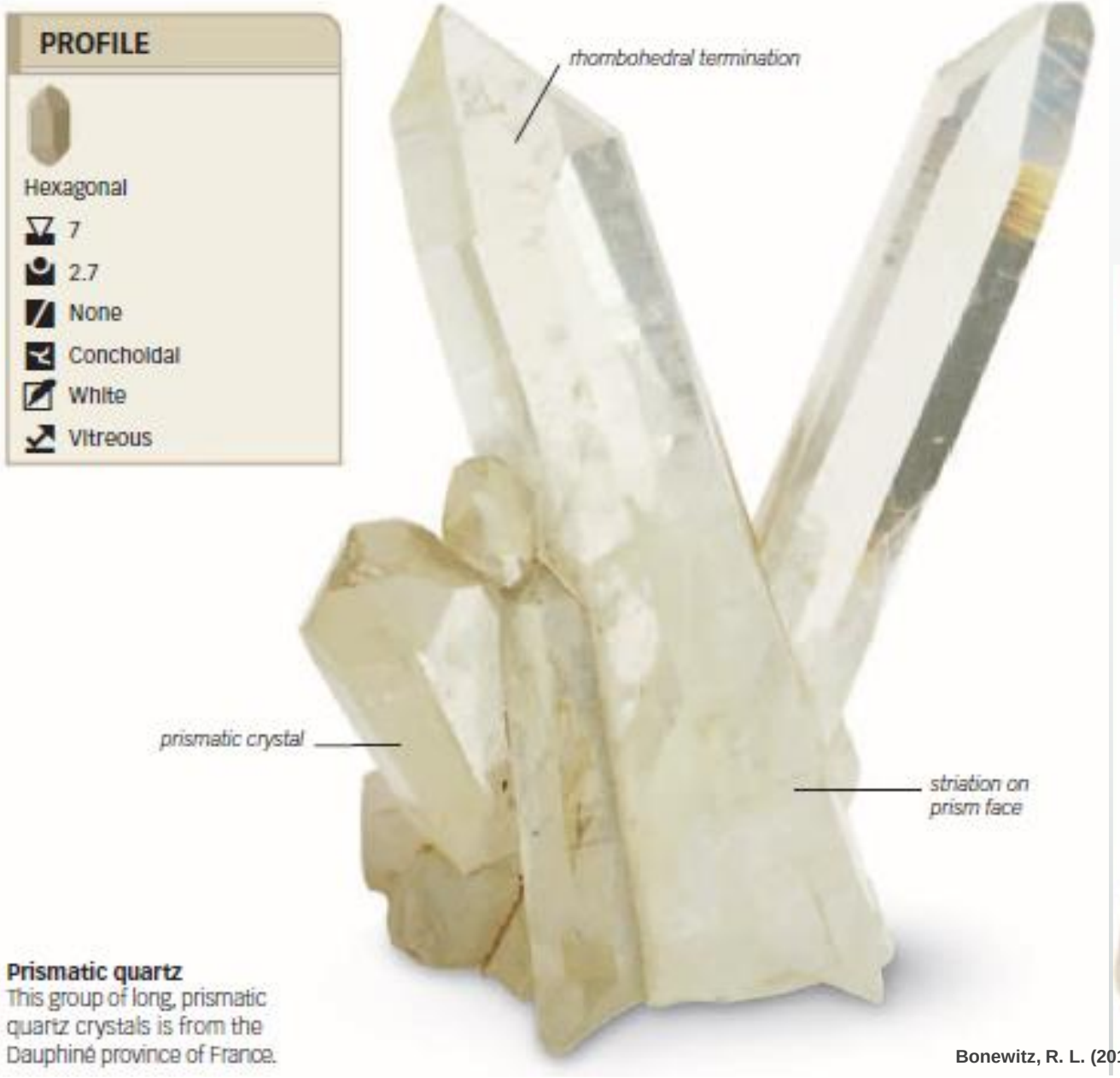
2. Hafta

2020-2021 Güz Dönemi

Bu ders notlarının hazırlanmasında Mefail Yeniyol'un sunumlarından ve Mineraloji kitabından yararlanılmıştır.

KUVARS

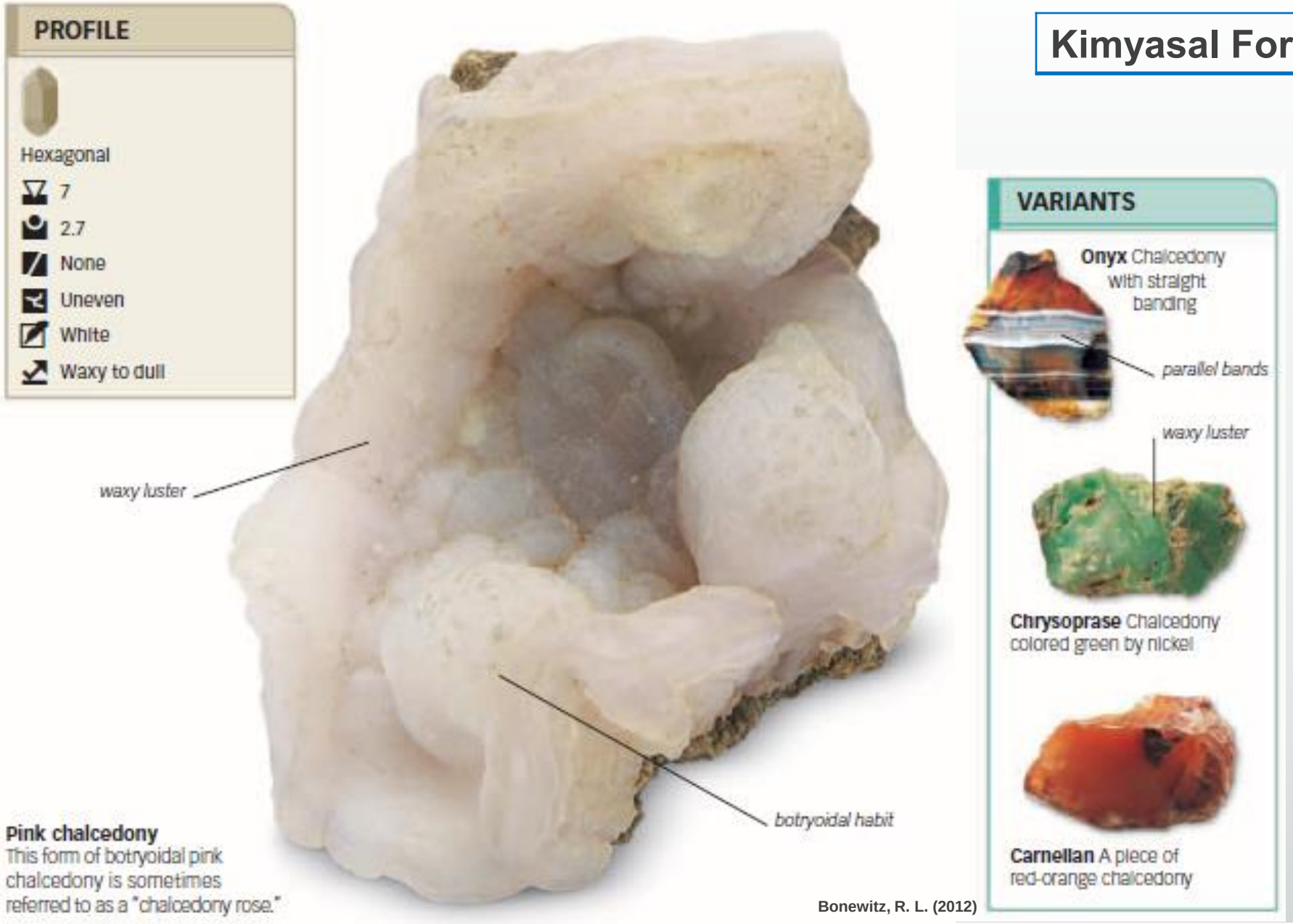
Kimyasal Formülü	SiO_2



Bonewitz, R. L. (2012)

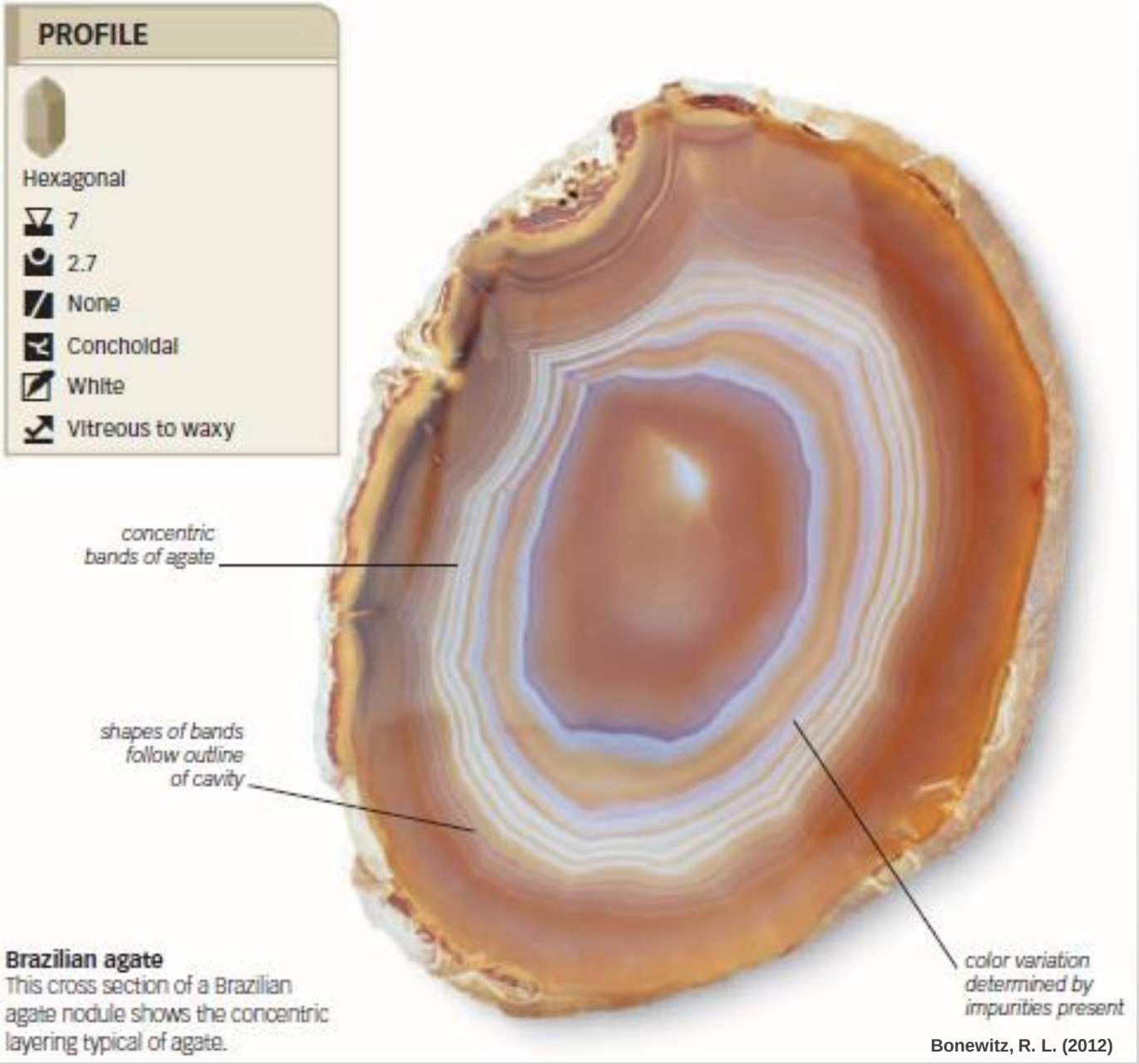
KALSEDON

Kimyasal Formülü	SiO_2



Bonewitz, R. L. (2012)

AGAT

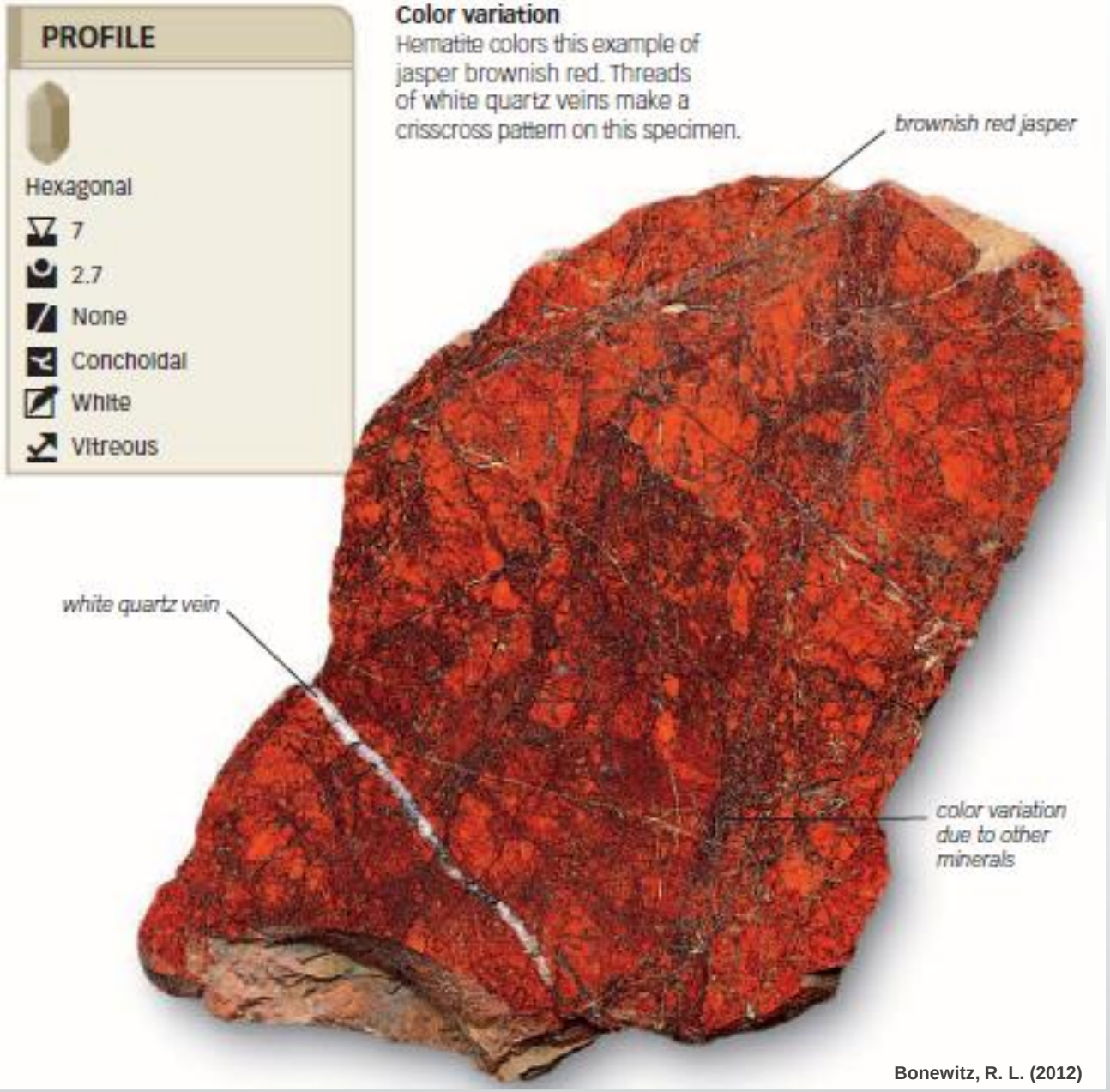


Brazilian agate
This cross section of a Brazilian agate nodule shows the concentric layering typical of agate.

Bonewitz, R. L. (2012)

Kimyasal Formülü	SiO_2

JASPER

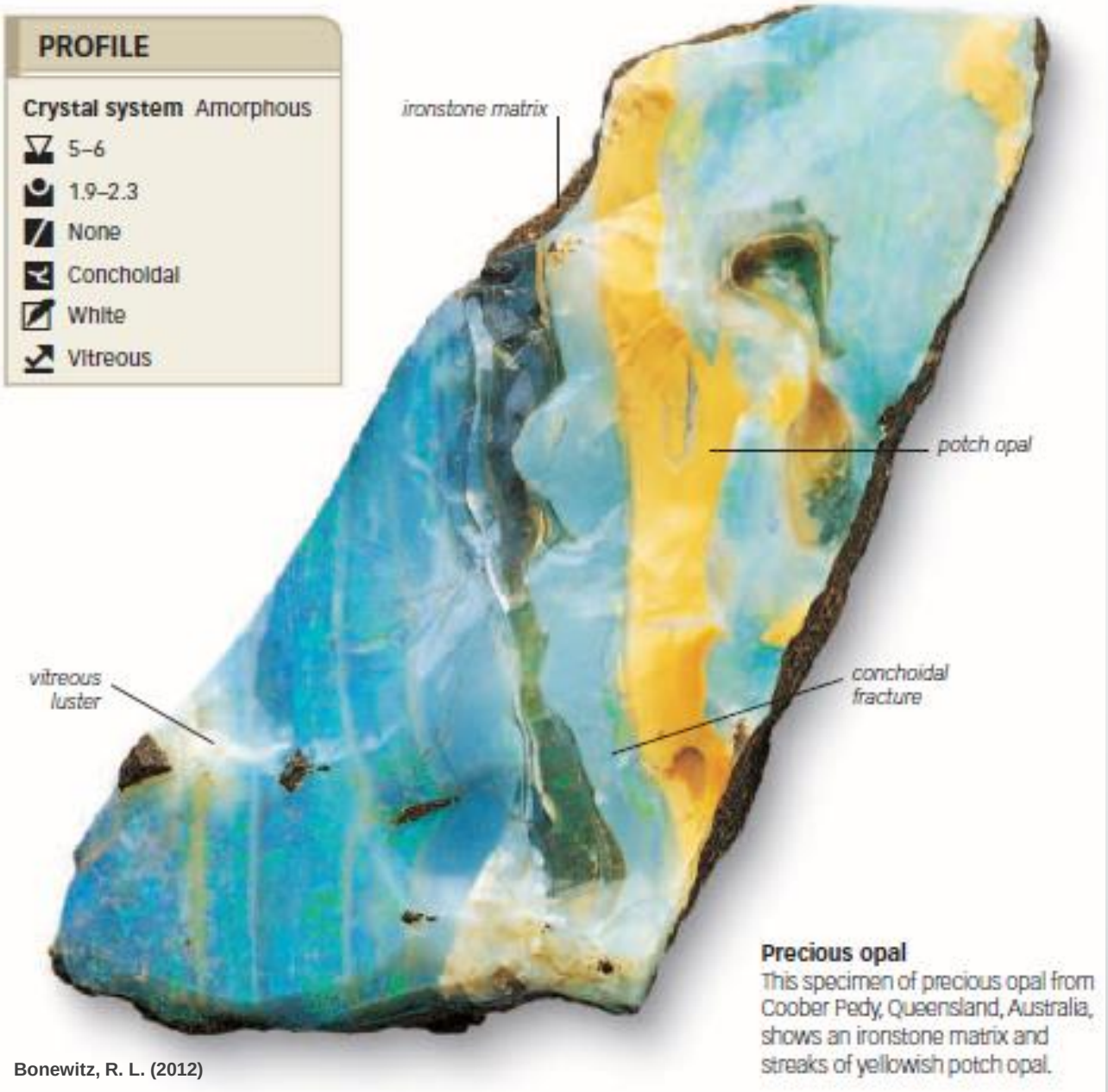


Bonewitz, R. L. (2012)

Kimyasal Formülü	SiO_2

OPAL

Kimyasal Formülü	SiO_2nH_2O



Precious opal
This specimen of precious opal from Coober Pedy, Queensland, Australia, shows an ironstone matrix and streaks of yellowish potch opal.

Bonewitz, R. L. (2012)

Victorian ring
Some cut opal dries and cracks with age and needs to be kept moist. The opal in this ring is well preserved.

ORTOKLAZ

Kimyasal Formülü	$KAlSi_3O_8$

PROFILE

Monoclinic

6–6½

2.5–2.6

Perfect

Subconcholdal to uneven, brittle

White

Vitreous

Orthoclase prisms In this specimen, white, blocky prisms of orthoclase are associated with cleavelandite albite and set in pegmatite.

Bonewitz, R. L. (2012)

VARIANTS

Yellow orthoclase A crystal of yellow orthoclase

Moonstone rough An opalescent variety of orthoclase

Orthoclase crystals Twinned orthoclase with smaller prism

Moonstone-set brooch Orthoclase exhibits the schiller effect which creates the shimmer seen on the moonstones in this brooch.

MİKROKLİN

Kimyasal Formülü	$KAlSi_3O_8$

PROFILE

Triclinic

6–6 ½

2.6

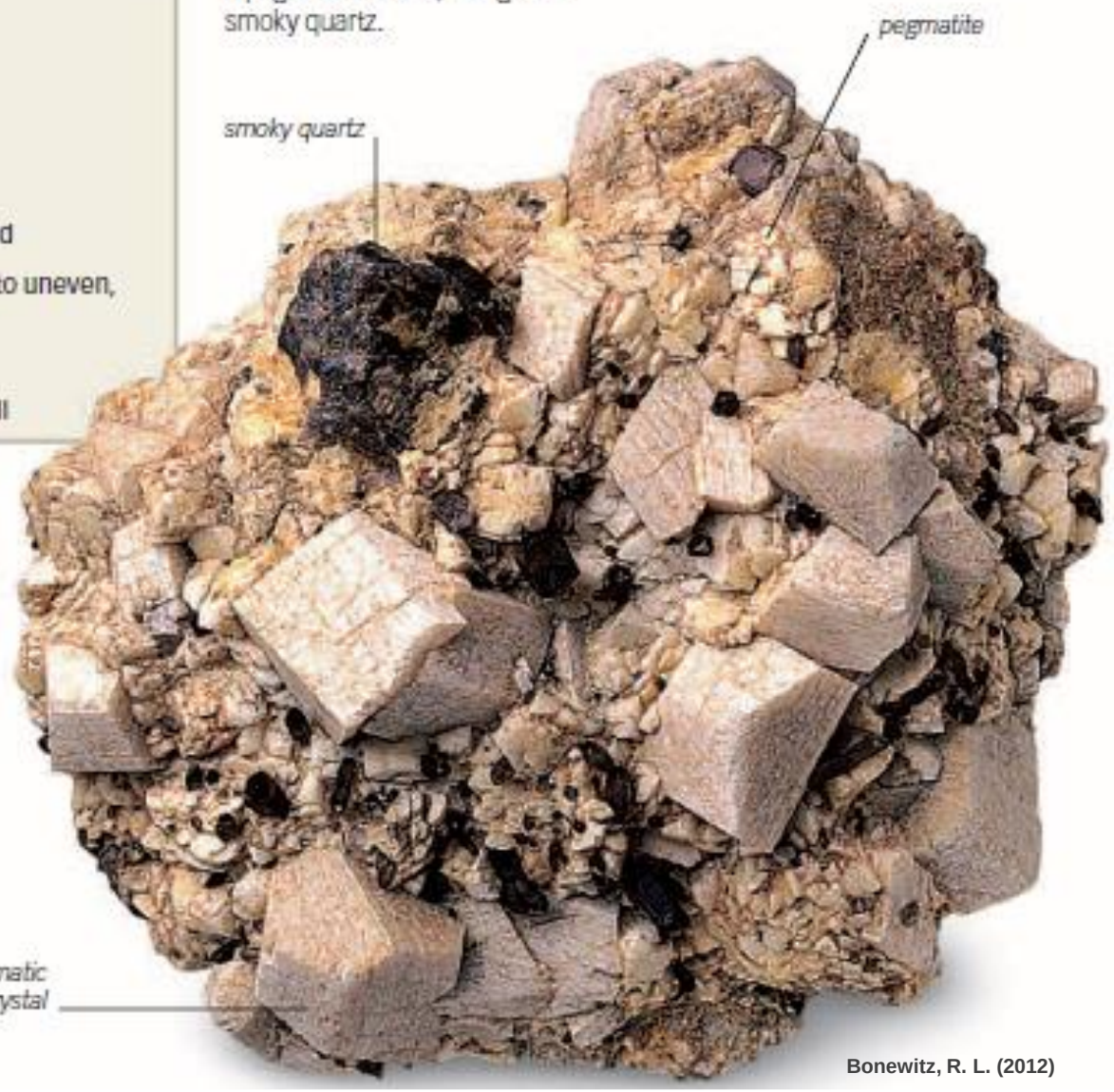
Perfect, good

Conchoidal to uneven, brittle

White

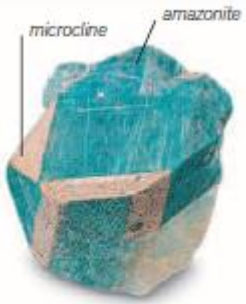
Vitreous, dull

Prismatic microcline
Numerous prismatic crystals of light-colored microcline sit atop a pegmatite matrix, along with smoky quartz.



Bonewitz, R. L. (2012)

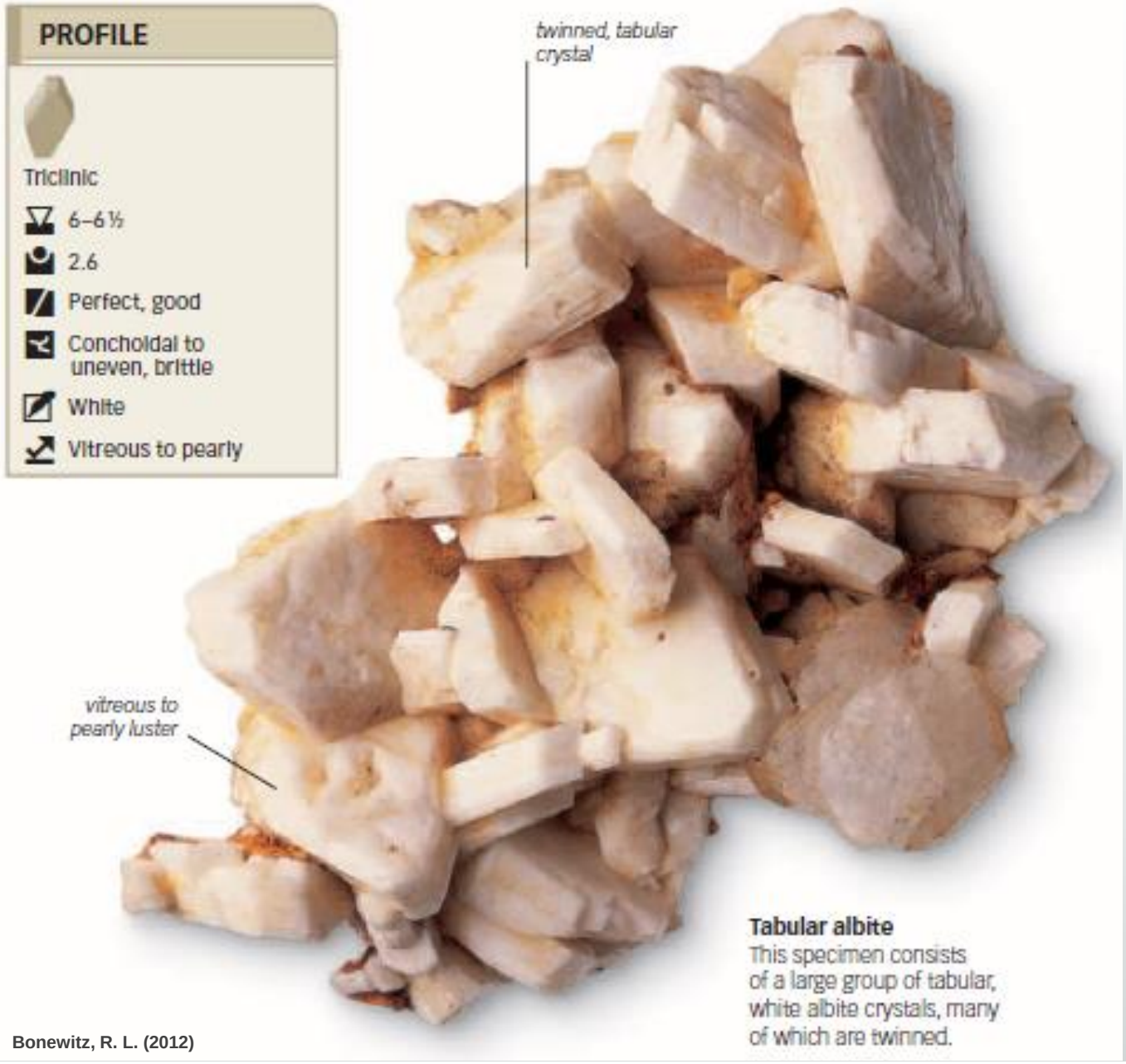
VARIANT



Amazonite A single crystal of blue-green amazonite, a variety of microcline

Amazonite cabochon
This Arts and Craft ring exhibits an asymmetrically set cabochon of amazonite in a rose-and-foliage design.

ALBİT



Bonewitz, R. L. (2012)

Kimyasal Formülü	$NaAlSi_3O_8$

Facet-grade albite
Faceted albite, although fragile, is sometimes used in jewelry, along with albite's moonstone variety.

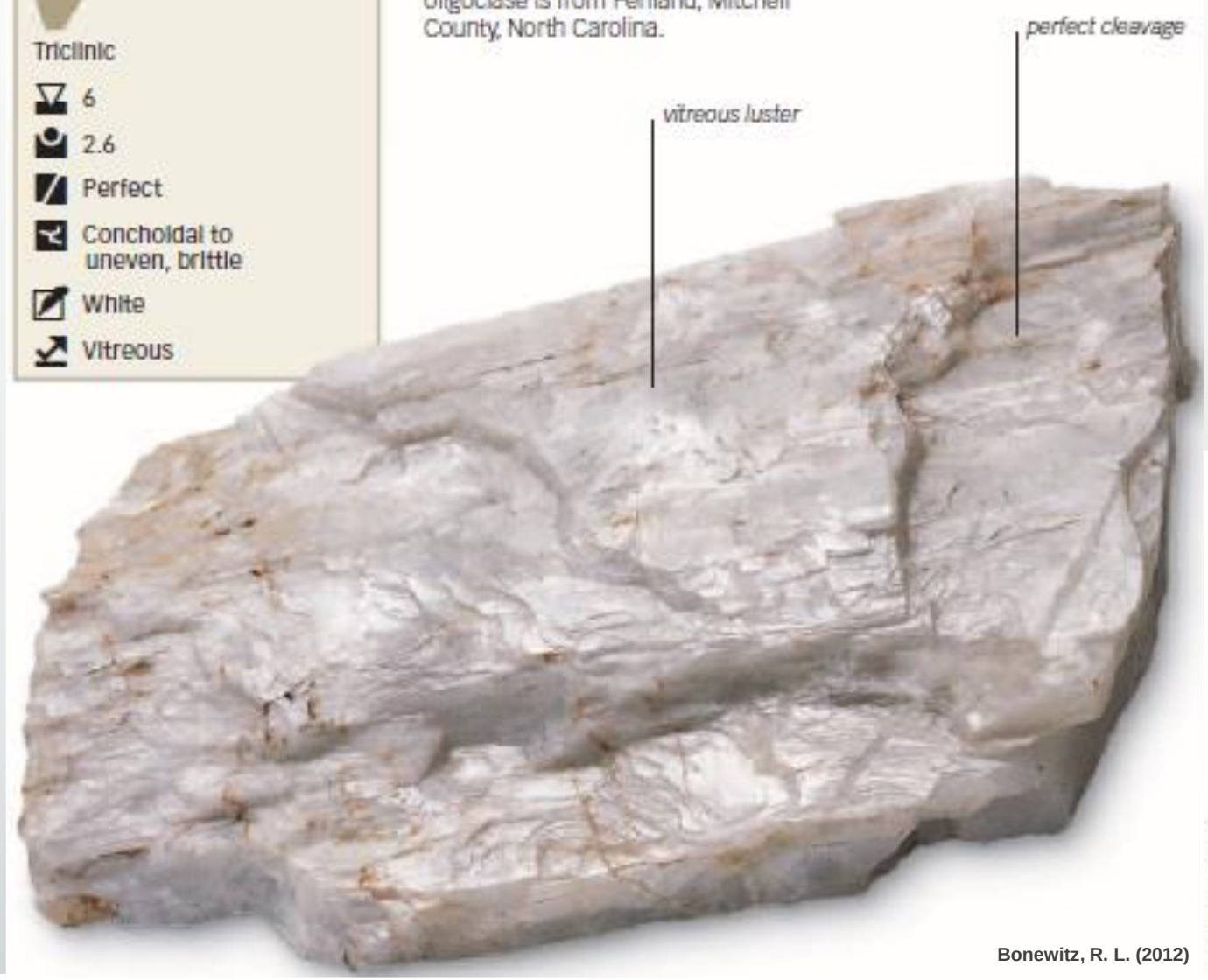
OLİGOKLAZ

Kimyasal Formülü	$(Na, Ca)Al_2Si_2O_8$

PROFILE

Triclinic
6
2.6
Perfect
Concholdal to uneven, brittle
White
Vitreous

Massive oligoclase
This typical massive specimen of oligoclase is from Penland, Mitchell County, North Carolina.

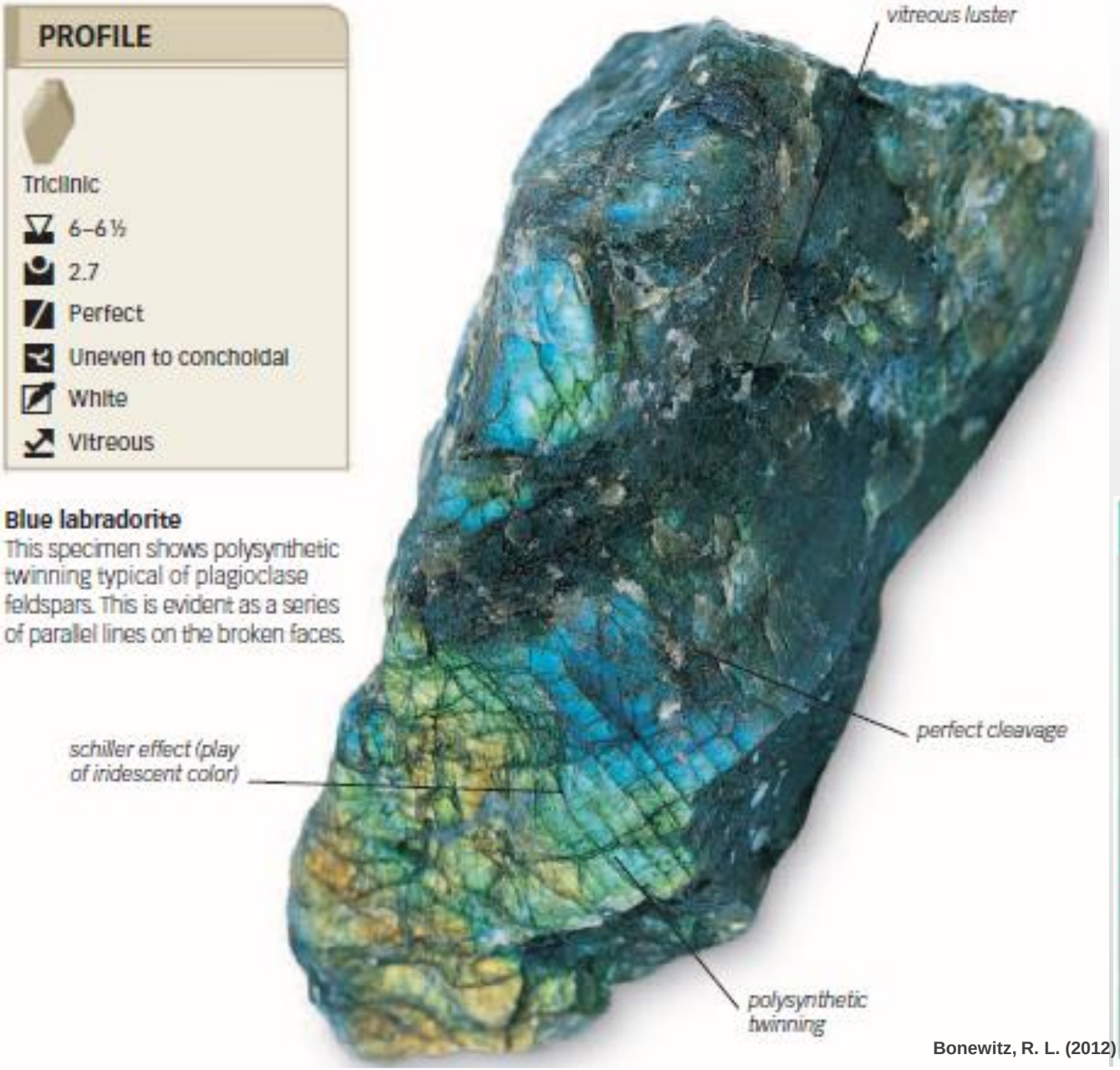


Bonewitz, R. L. (2012)

Semiprecious oligoclase
Sunstone oligoclase, such as the oval example seen here, has hematite or goethite inclusions.

LABRADOR

Kimyasal Formülü	$(Na, Ca)Al_2Si_2O_8$



Bonewitz, R. L. (2012)

SODALİT

Kimyasal Formülü	$(Na4Al_3Si_3O_{12}Cl$

PROFILE

Cubic

5½–6

2.1–2.3

Poor to distinct

Uneven to concholdal

White to light blue

Vitreous to greasy

Massive sodalite
This sodalite specimen shows intense blue color, which can sometimes lead to the mineral being mistaken for lapis lazuli.

Bonewitz, R. L. (2012)

VARIANTS

Polished sodalite A specimen that has been polished to bring out its color

Indian sodalite A specimen of light blue sodalite found in India

Sodalite beads
This unusual modern Egyptian necklace has beads made of blue sodalite and red carnelian.

SERPANTİN

Kimyasal Formülü	$(Mg, Fe, Ni)_3Si_2O_5(OH)_4$

PROFILE

Monoclinic or triclinic

3½–5½

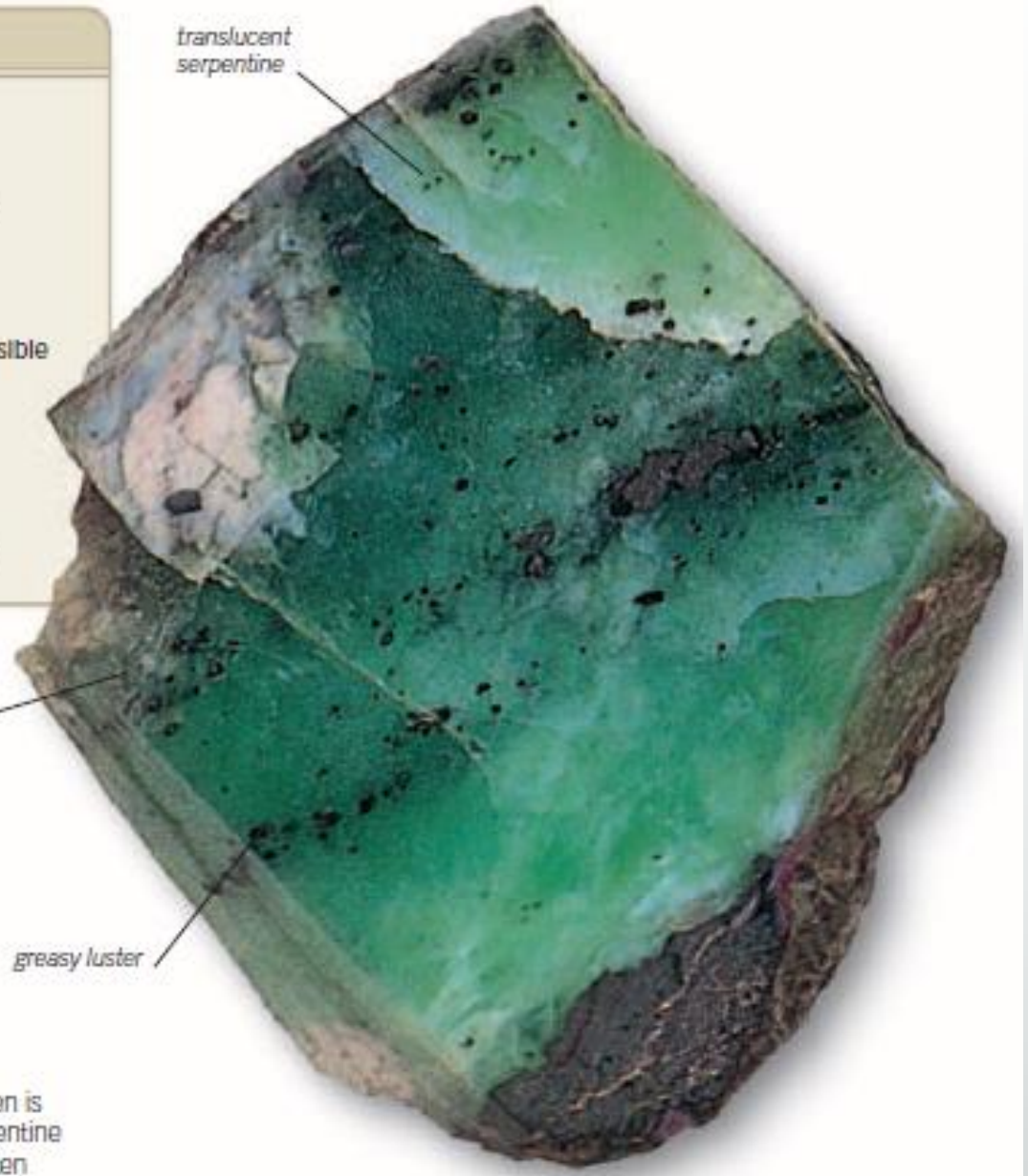
2.5–2.6

Perfect but not visible

Conchoidal to splintery

White

Subvitreous to greasy, resinous, earthy, dull



Precious serpentine
This high-quality specimen is composed of many serpentine minerals. It is the kind often carved and sold as jade.

Bonewitz, R. L. (2012)

VARIANTS

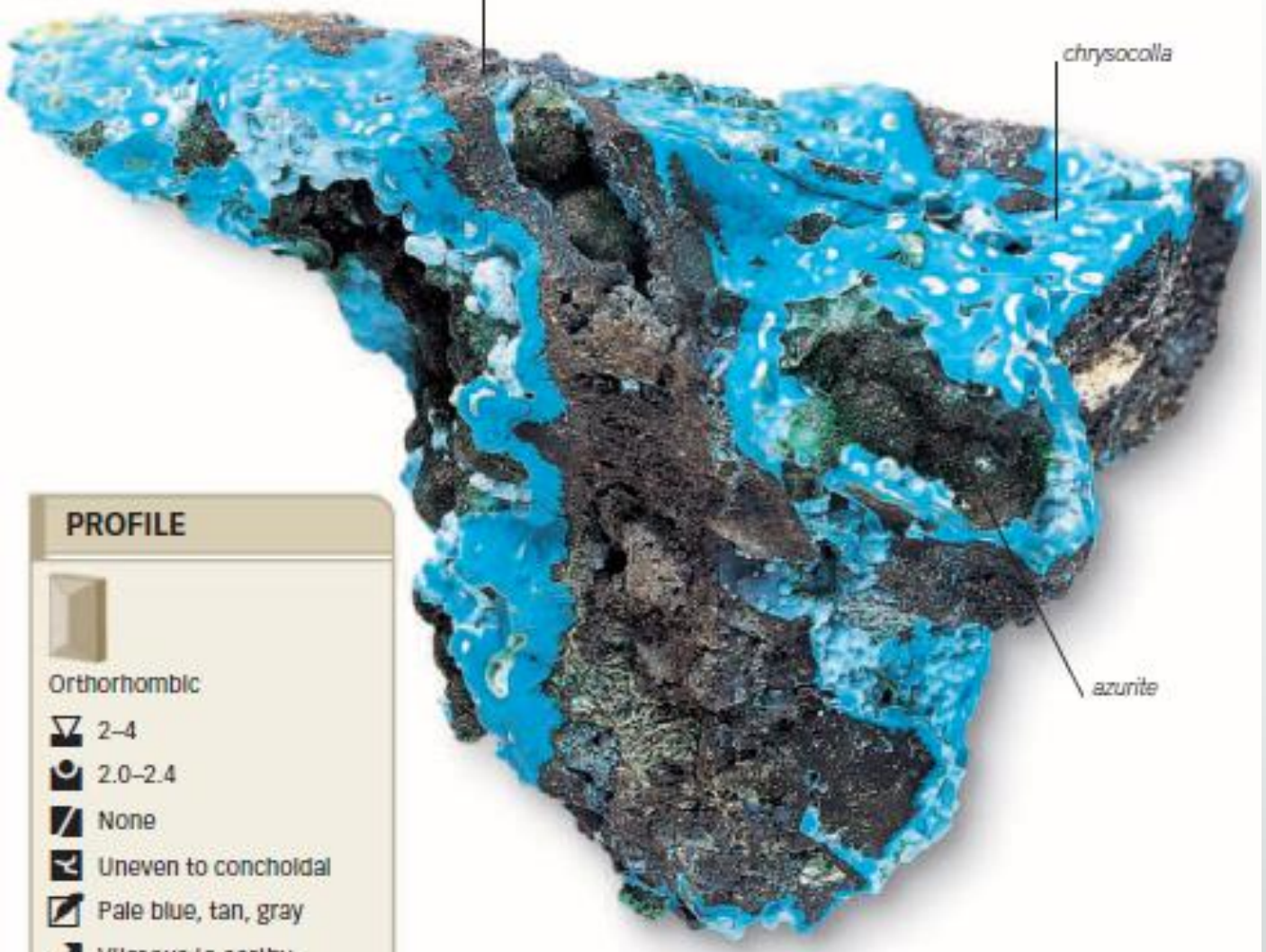
Lizardite A specimen of this fine-grained serpentine mineral from Cornwall, UK

Antigorite A specimen of this serpentine mineral with characteristic, corrugated plates

Williamsite cabochon
A variety of serpentine, williamsite is an ornamental stone that is sometimes cut as an inexpensive gem.

KRİZOKOL

Chrysocolla with azurite
In this specimen, chrysocolla can be seen with the carbonate mineral azurite in a rock matrix.



PROFILE

Orthorhombic
2–4
2.0–2.4
None
Uneven to conchoidal
Pale blue, tan, gray
Vitreous to earthy

Bonewitz, R. L. (2012)

Kimyasal Formülü	$Cu_2H_2(Si_2O_5)(OH)_4nH_2O$

Chrysocolla bracelet
Rich blue-green chrysocolla, such as the cabochon in this antique bracelet, is highly prized as a gemstone.

Cabochon Green chrysocolla within reddish iron oxide

PREHNİT

Kimyasal Formülü	$Ca_2Al_2Si_3O_{10}(OH)_2$

PROFILE

Orthorhombic

6–6½

2.9

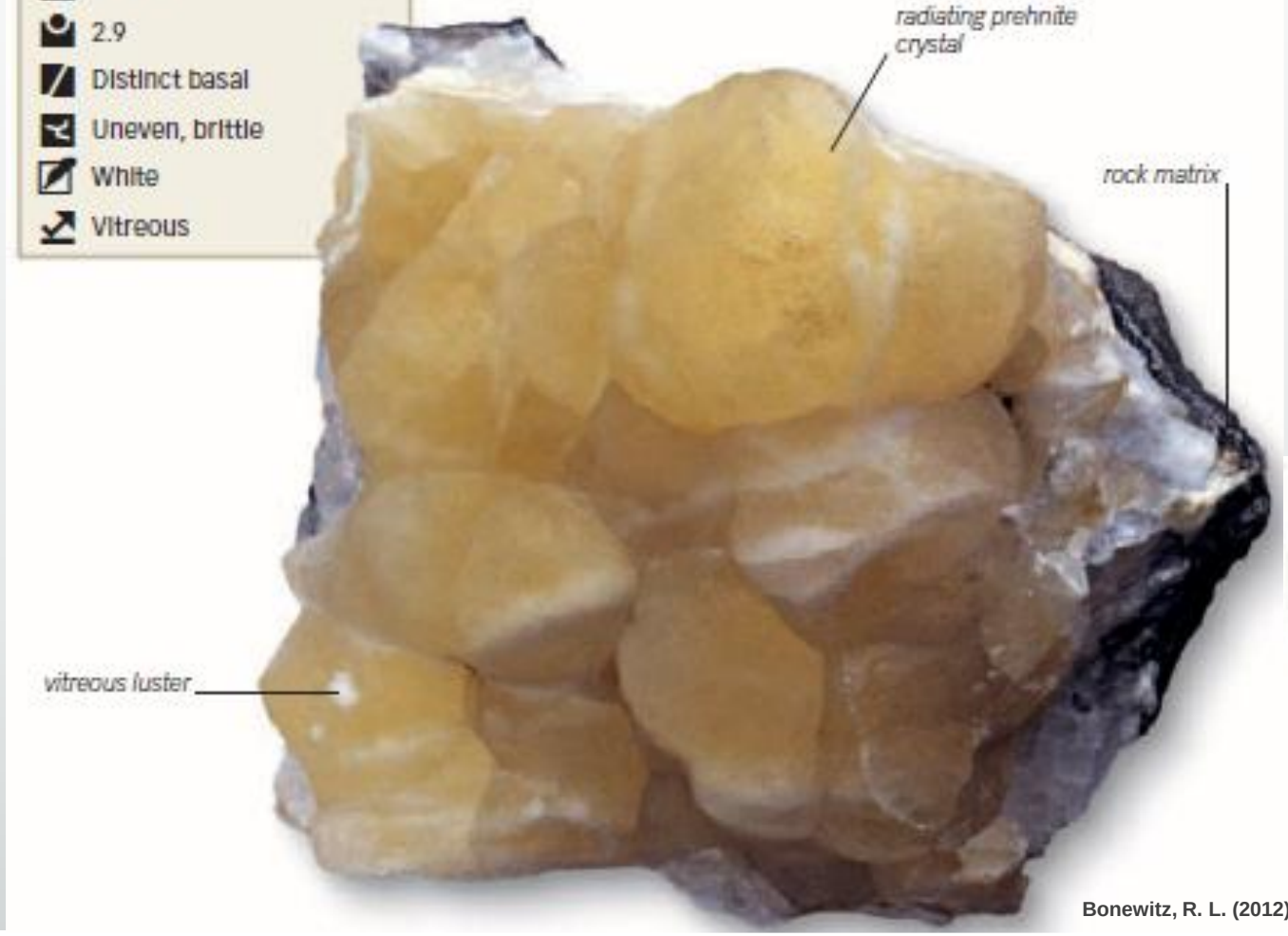
Distinct basal

Uneven, brittle

White

Vitreous

Botryoidal prehnite
A group of radiating crystal masses of prehnite resting on a rock matrix gives a botryoidal form to this specimen.



White cabochon
Prehnite gems, such as this creamy white cabochon with dark inclusions, are almost too soft to wear.

Bonewitz, R. L. (2012)

ENSTATİT

PROFILE

Orthorhombic

5–6

3.1–3.9

Good to perfect

Uneven

Gray to white

Vitreous

Prismatic crystals
This mass of small, prismatic enstatite crystals rests on a rock matrix.

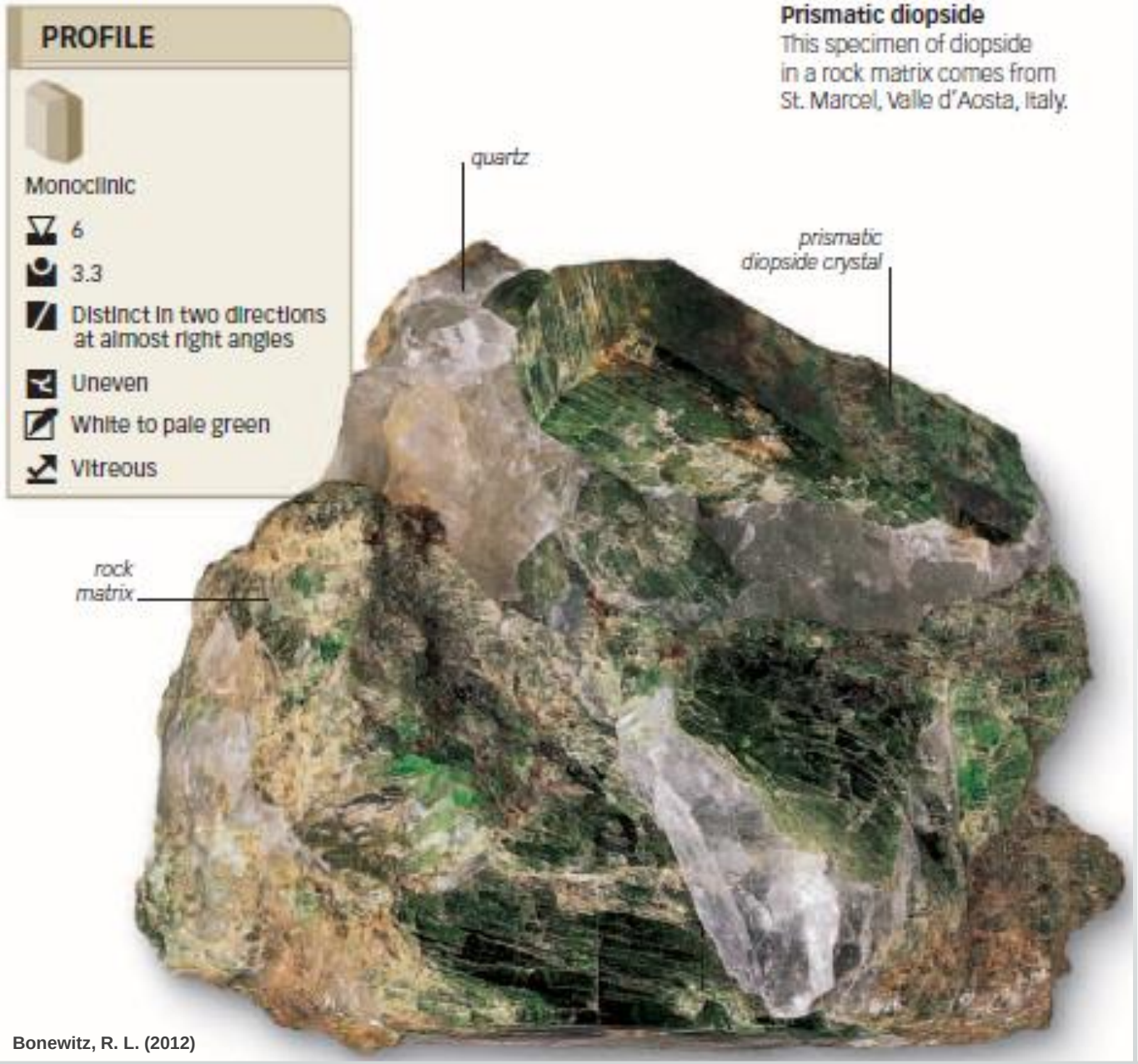
Bonewitz, R. L. (2012)

Kimyasal Formülü	$Mg_2Si_2O_6$

Mixed-cut enstatite
Recovered from Myanmar and Sri Lanka, facet-grade enstatite, such as this gem, is mainly cut for collectors.

DİYOPSİT

Kimyasal Formülü	$CaMgSi_2O_6$



Prismatic diopside
This specimen of diopside in a rock matrix comes from St. Marcel, Valle d'Aosta, Italy.

Bonewitz, R. L. (2012)

Chrome diopside
Emerald-green diopside, such as the gem shown here, is chromium-rich and is also known as chrome diopside.

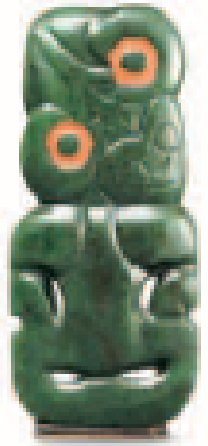
NEFRİT

Polished nephrite
This small boulder of nephrite has been sliced and polished to reveal its quality.

PROFILE

Monoclinic
6½
2.9–3.4
Perfect
Splintery, brittle
White
Dull to waxy

Kimyasal Formülü	$Ca_2(Mg, Fe)_5(Si_8O_{22})(OH)_2$



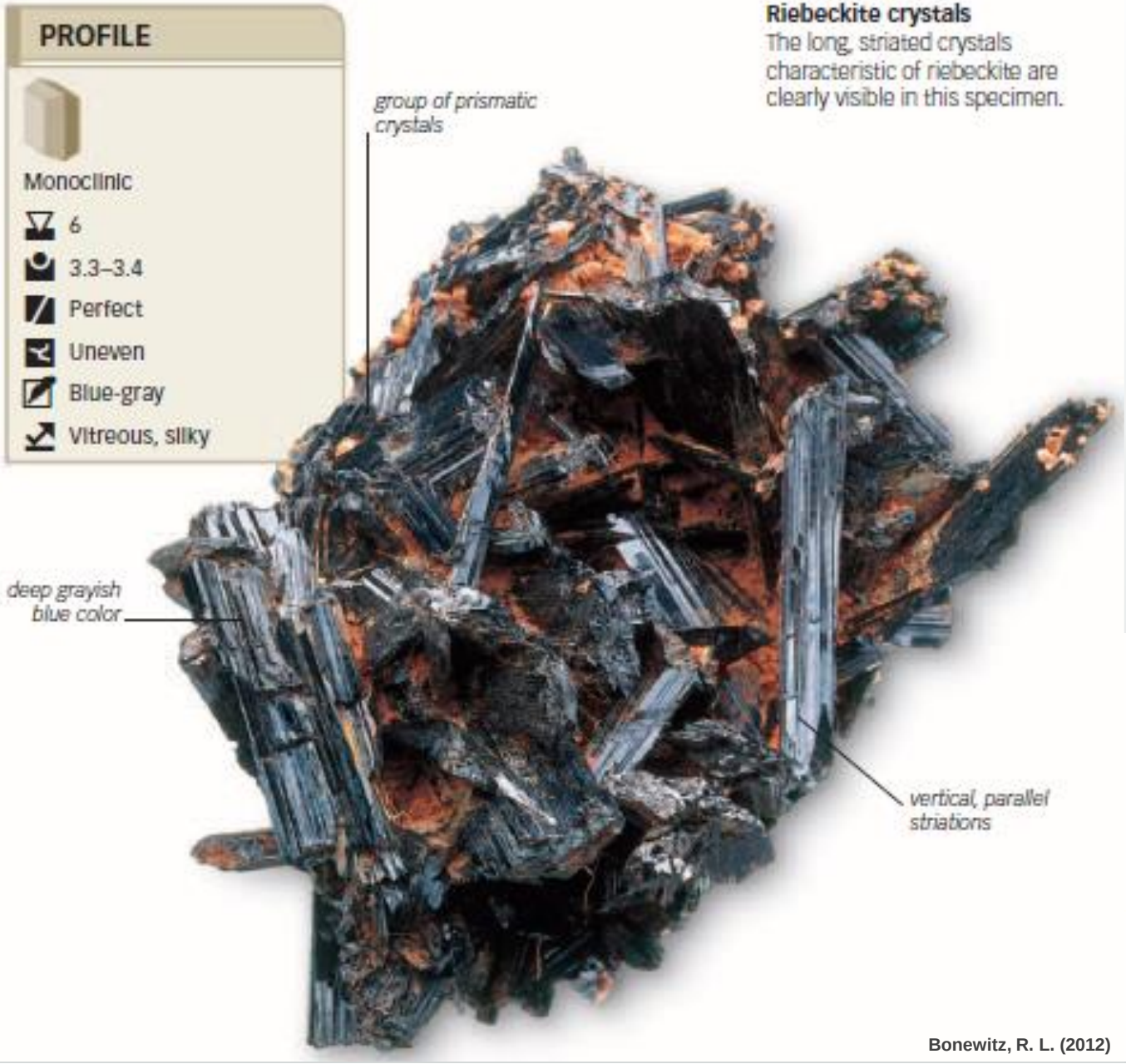
Nephrite tiki
Hei tikis, such as this one made of nephrite, are worn by the Maori of New Zealand.

Light green nephrite A mass of light green nephrite

Bonewitz, R. L. (2012)

RİBEKİT

Riebeckite crystals
The long, striated crystals characteristic of riebeckite are clearly visible in this specimen.



Kimyasal Formülü	$Na_2(Fe_3,Fe_2)(Si_8O_{22})(OH)_2$

Tiger's eye ring
Crocidolite, a variant of riebeckite, forms the gemstone tiger's eye when it is silica-saturated.

Bonewitz, R. L. (2012)

KORDİYERİT

PROFILE

Orthorhombic

7–7½

2.6

Moderate to poor

Concholdal to uneven

White

Vitreous to greasy

Cordierite crystals
This group of short prismatic, dark gray cordierite crystals occurs in a rock matrix.

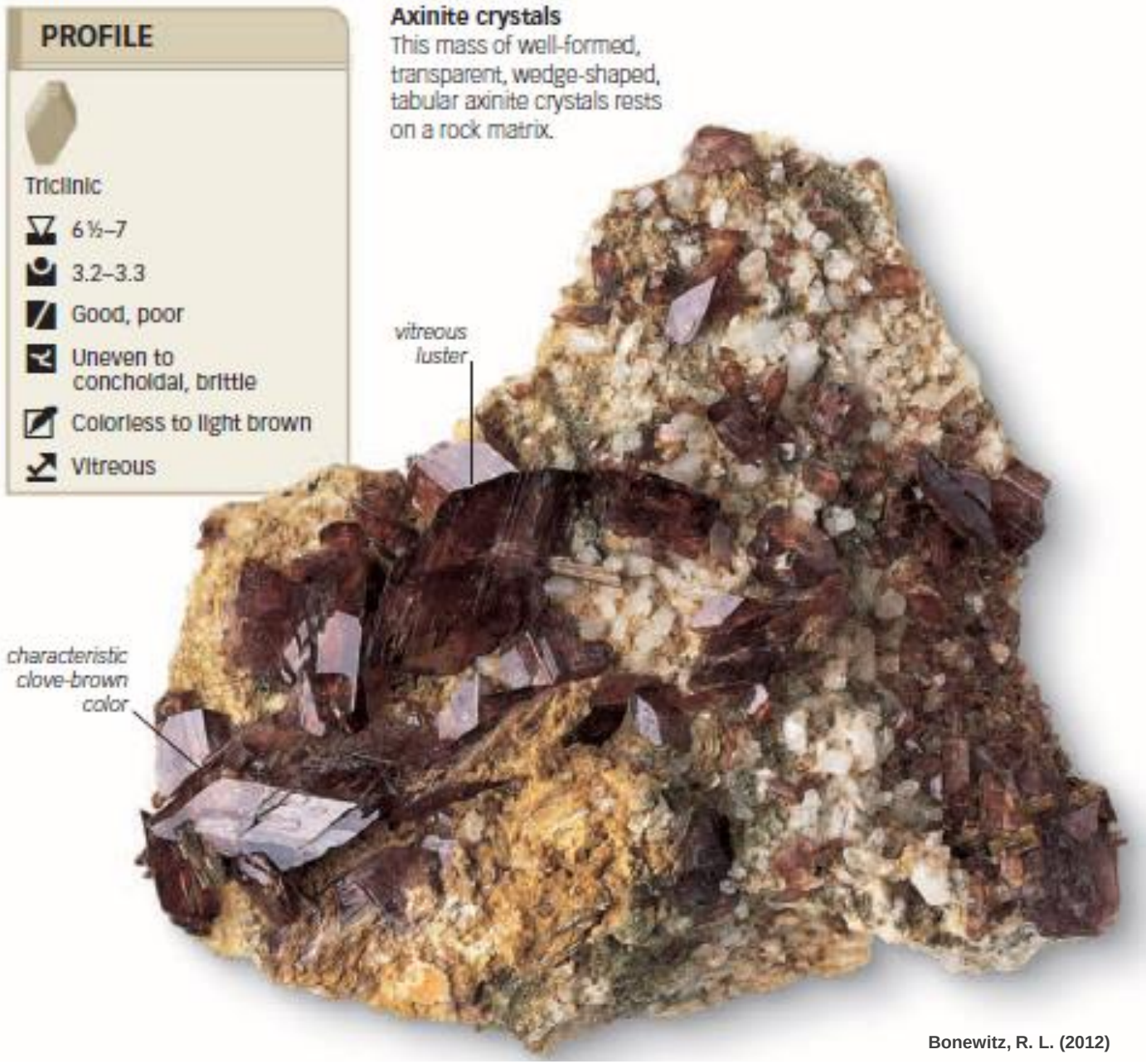
Bonewitz, R. L. (2012)

Kimyasal Formülü	$(Mg, Fe)_2Al_4Si_5O_{18}$

Cordierite jewelry
A variety of cordierite, iolite is used in ornaments because of its color and brilliance.

AKSİNİT

Kimyasal Formülü	$Ca_2FeAl_2(BSi_4O_{15})(OH)$

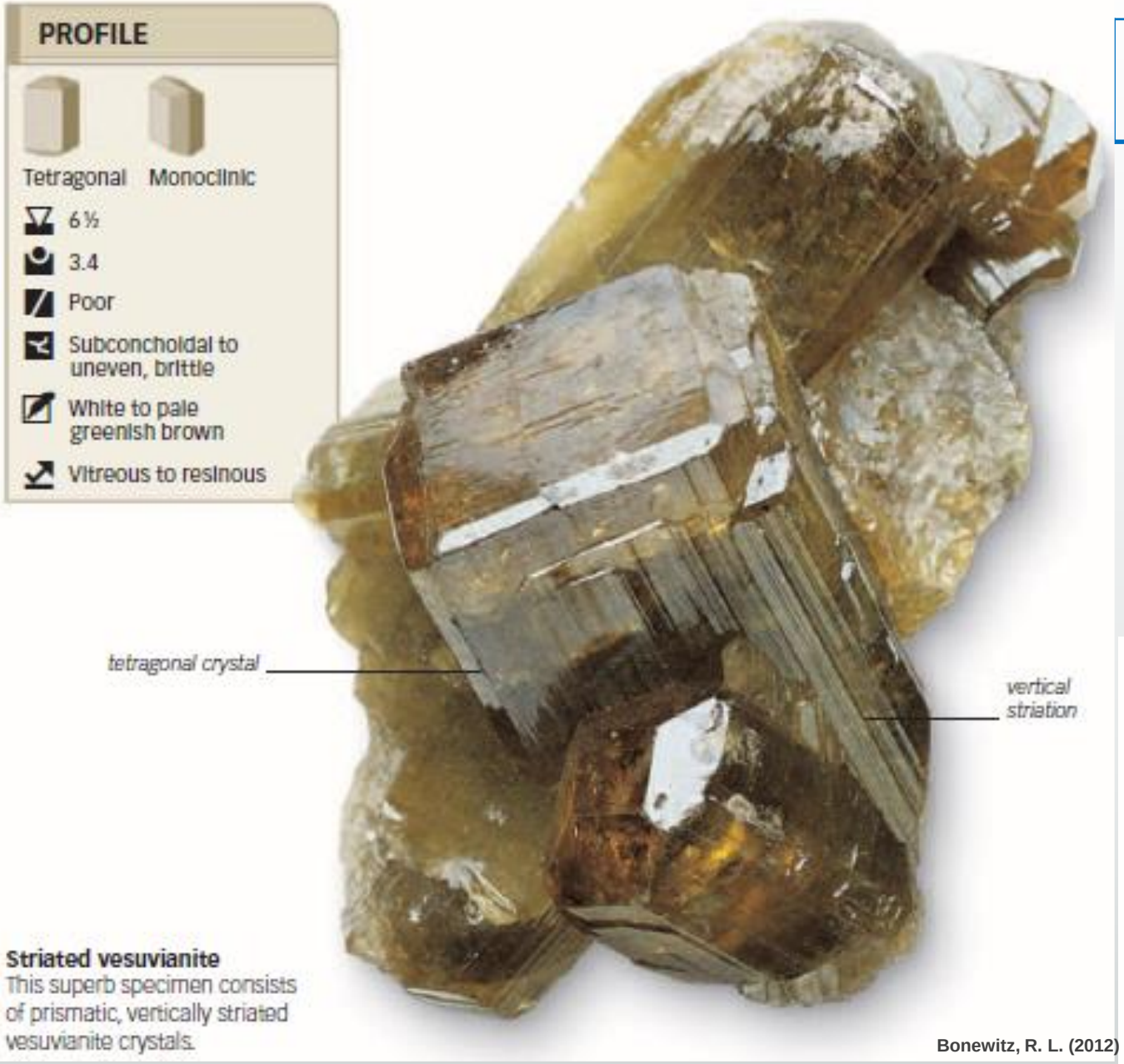


Axinite crystals
This mass of well-formed, transparent, wedge-shaped, tabular axinite crystals rests on a rock matrix.

Bonewitz, R. L. (2012)

Axinite gemstone
Brilliant-cut axinite crystals, such as this specimen in an unusual shade of violet, are popular with collectors.

VEZÜVİYANİT



Striated vesuvianite
This superb specimen consists of prismatic, vertically striated vesuvianite crystals.

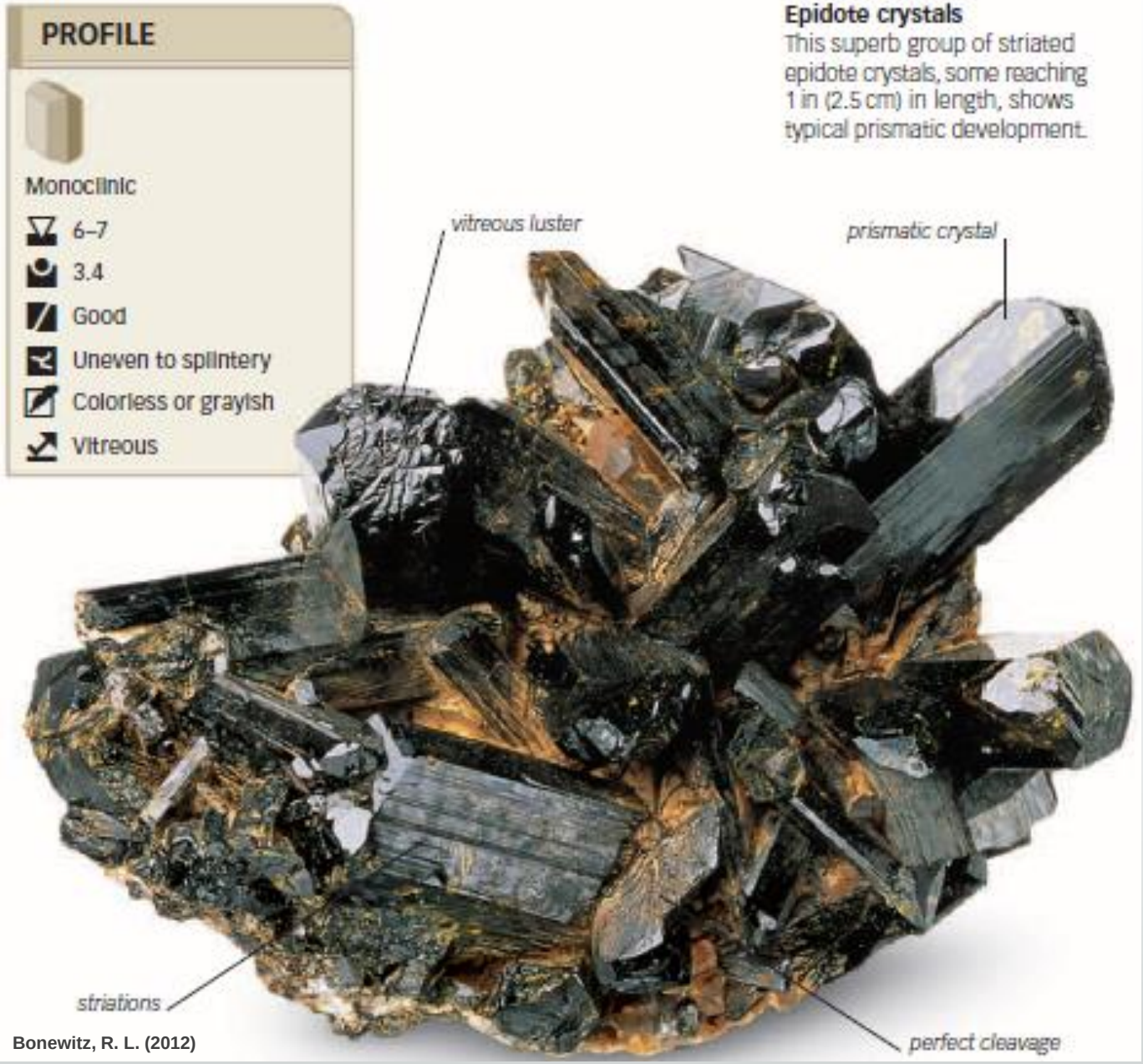
Bonewitz, R. L. (2012)

Kimyasal Formülü	$Ca_{10}(MgFe)_2Al_4(SiO_4)_5(Si_2O_7)_2(OH, F)_4$

Vesuvianite gem
Occasionally, vesuvianite is found in translucent to transparent crystals suitable for cutting into gems.

EPİDOT

Epidote crystals
This superb group of striated epidote crystals, some reaching 1 in (2.5 cm) in length, shows typical prismatic development.



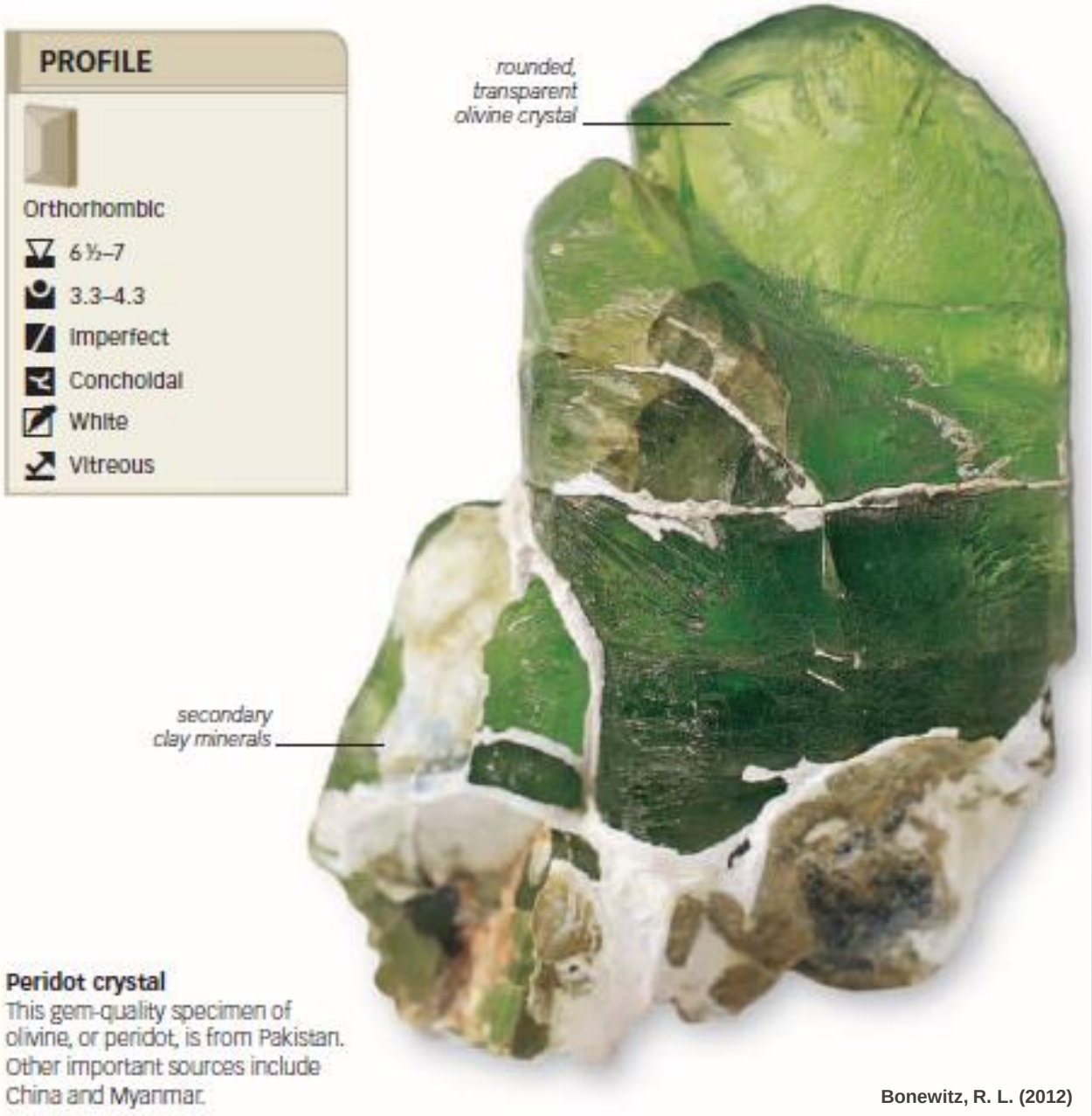
Bonewitz, R. L. (2012)

Kimyasal Formülü	$Ca_2Al_2(FeAl)(SiO_4)(Si_2O_7)O(OH)$

Epidote gemstone
Clear, yellowish green to dark brown epidote gems are rare. Transparent crystals are cut for collectors.

OLİVİN

Kimyasal Formülü	$(Mg, Fe)_2SiO_4$



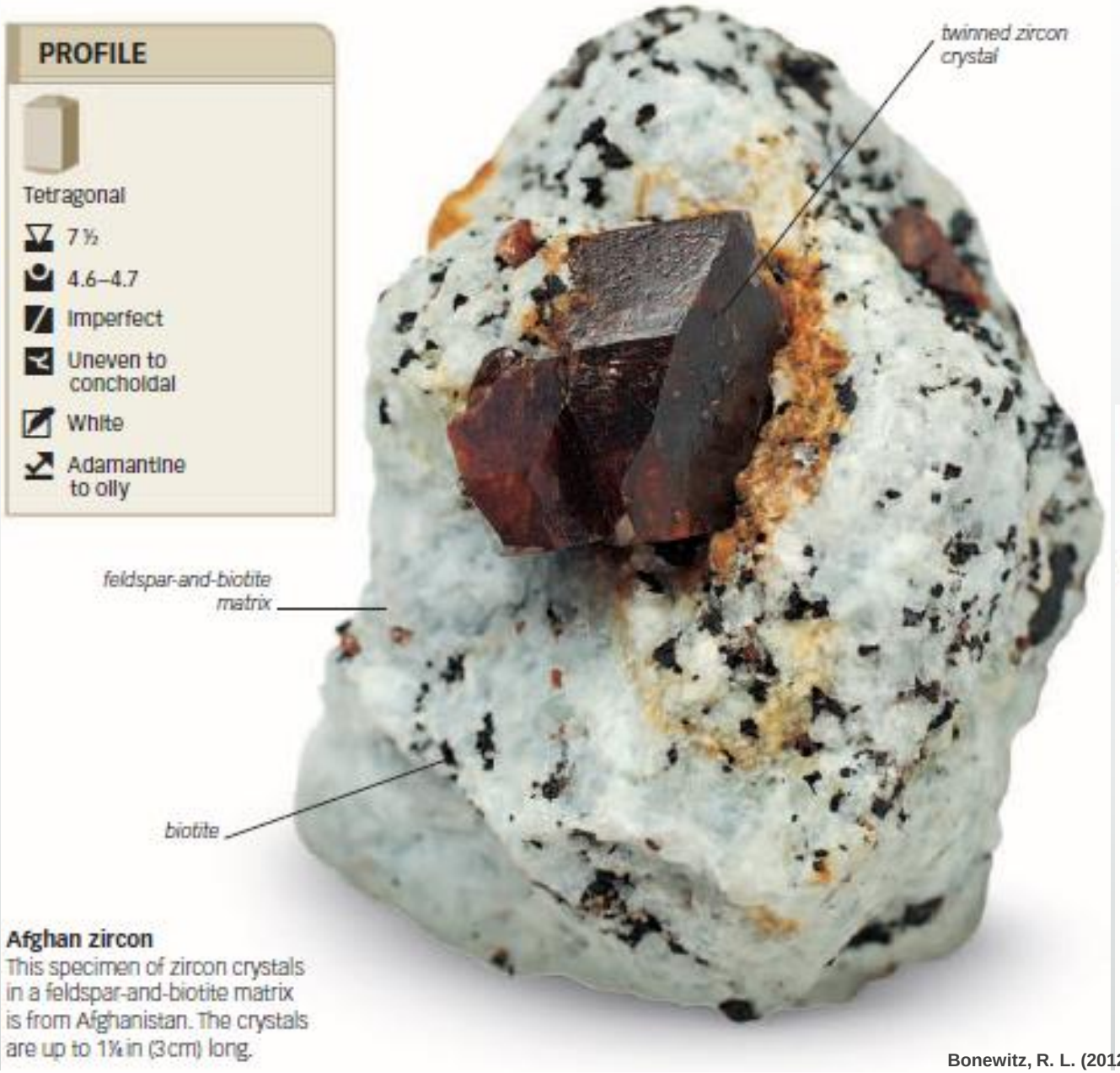
Peridot crystal
This gem-quality specimen of olivine, or peridot, is from Pakistan. Other important sources include China and Myanmar.

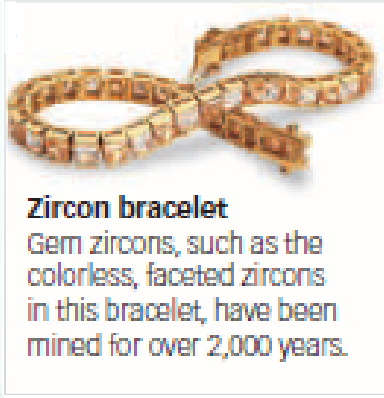
Bonewitz, R. L. (2012)

Peridot gemstone
Green peridot, such as the one in this brooch, was used by Egyptians since the second millennium BCE.

ZİRKON

Kimyasal Formülü	$ZrSiO_4$

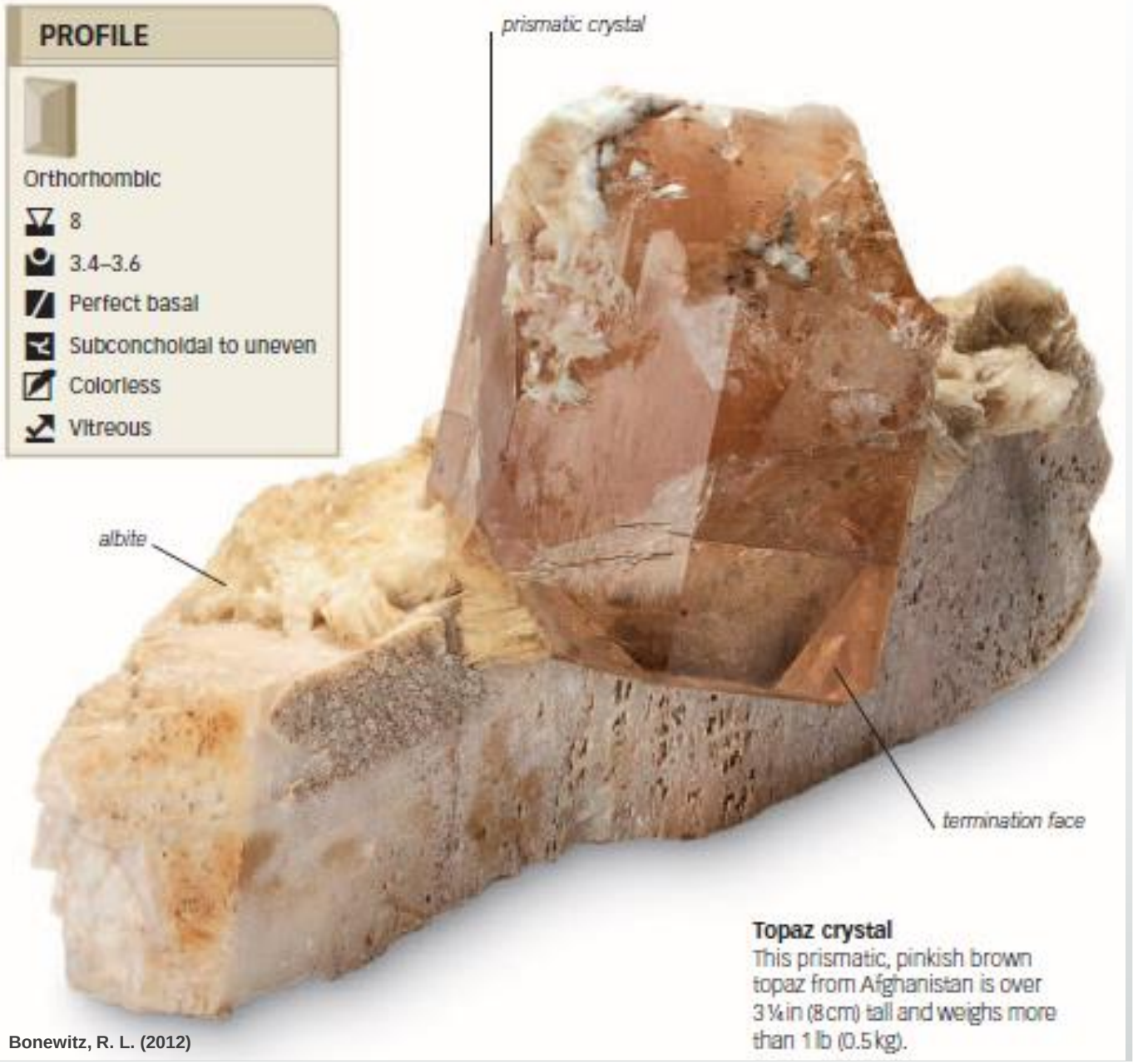




Bonewitz, R. L. (2012)

TOPAZ

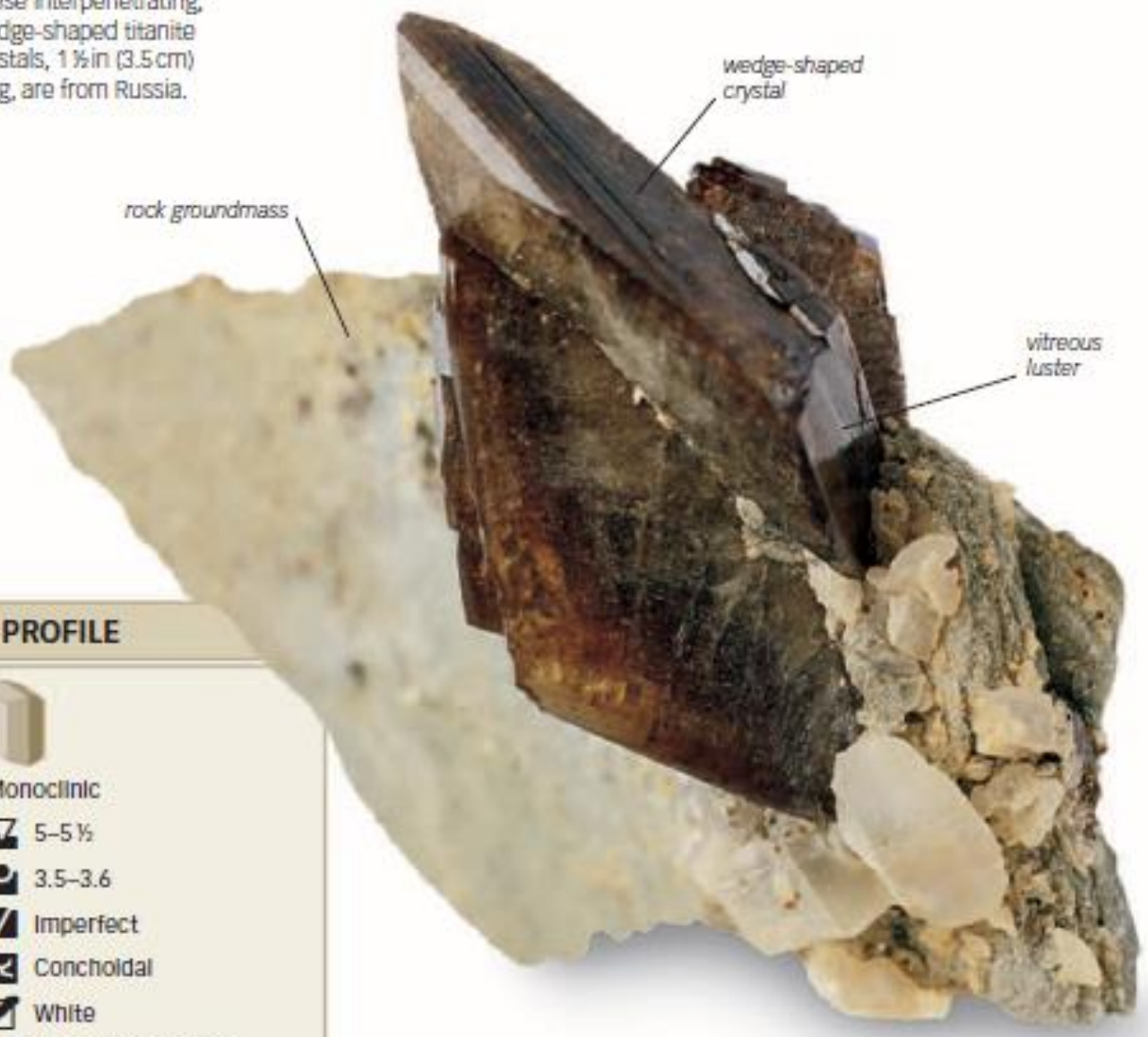
Kimyasal Formülü	$Al_2SiO_4(F, OH)_2$



Bonewitz, R. L. (2012)

TİTANİT

Titanite crystals
These interpenetrating, wedge-shaped titanite crystals, 1½ in (3.5 cm) long, are from Russia.



PROFILE

Monoclinic
5–5½
3.5–3.6
Imperfect
Conchoidal
White
Vitreous to greasy

Bonewitz, R. L. (2012)

Kimyasal Formülü	$CaTiSiO_5$

Titanite ring
Faceted titanites, such as the brilliant cut set in this gold ring, have superb fire and intense colors.

ANDALUZİT

PROFILE

Orthorhombic

6½–7½

3.2

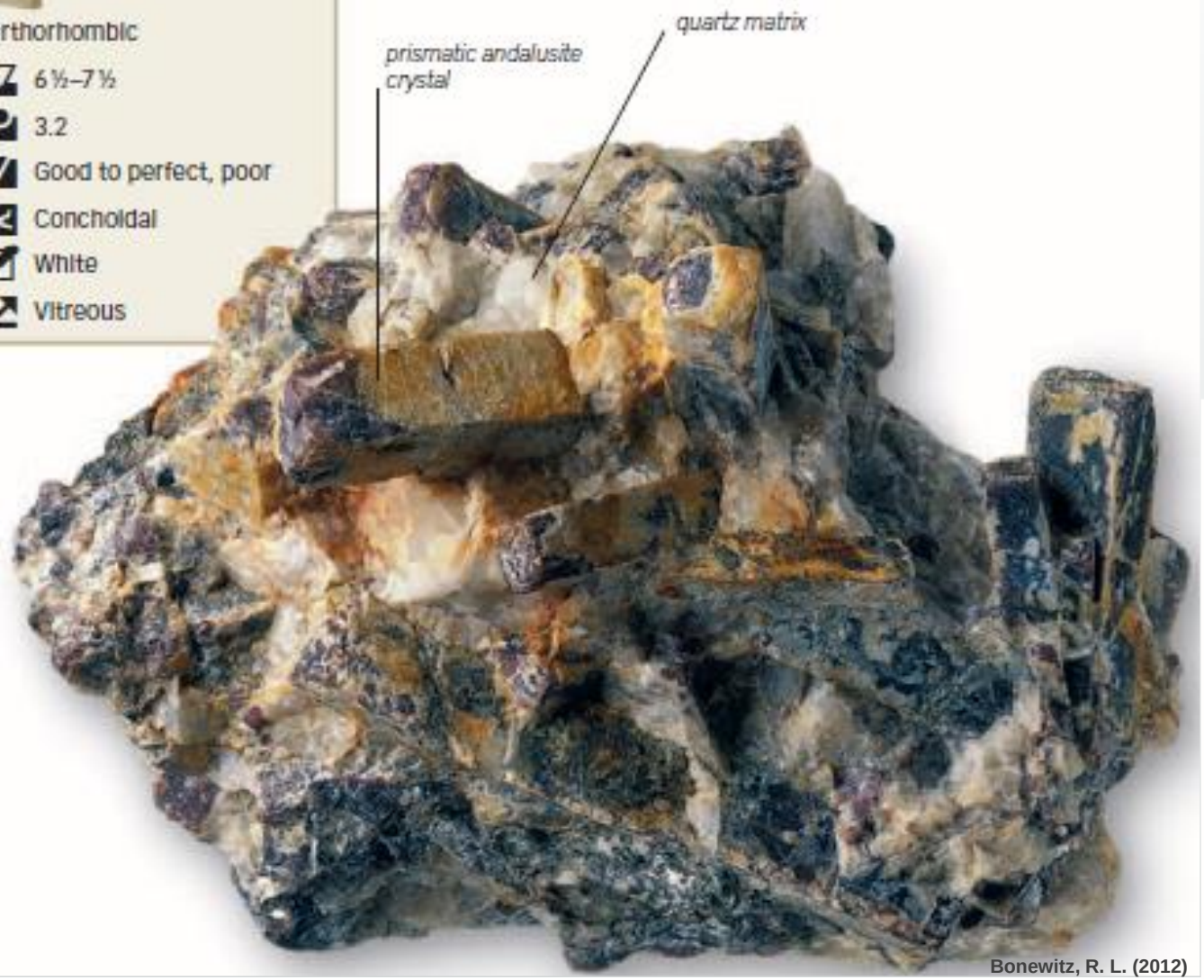
Good to perfect, poor

Conchoidal

White

Vitreous

Andalusite crystals
This group of prismatic andalusite crystals from the Austrian Tyrol is in a matrix of quartz.



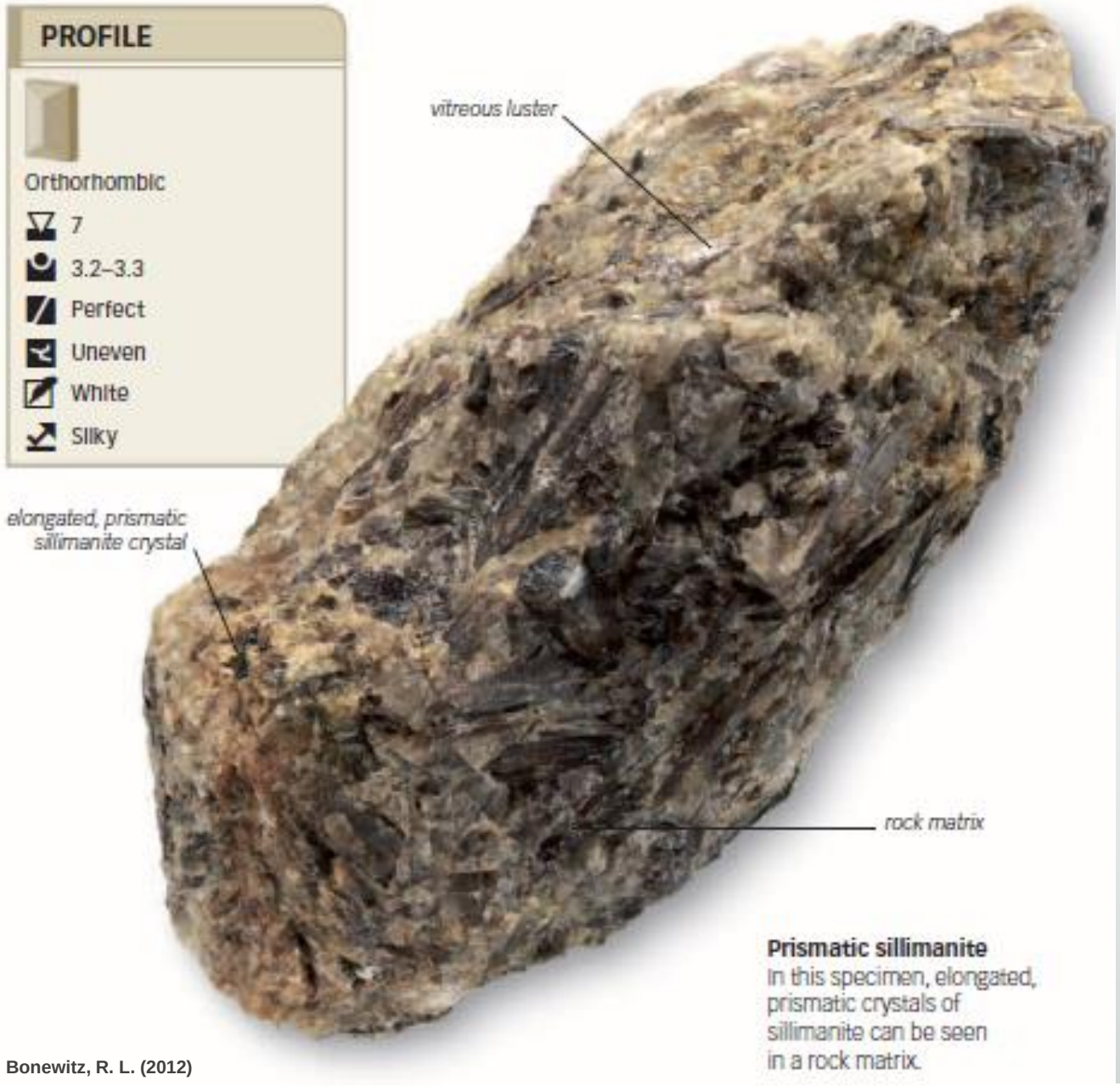
Bonewitz, R. L. (2012)

Kimyasal Formülü	Al_2OSiO_5

Rectangular step cut
Relatively uncommon, transparent andalusite is too brittle to be worn. It is faceted for gem collectors.

SİLİMANİT

Kimyasal Formülü	Al_2OSiO_5



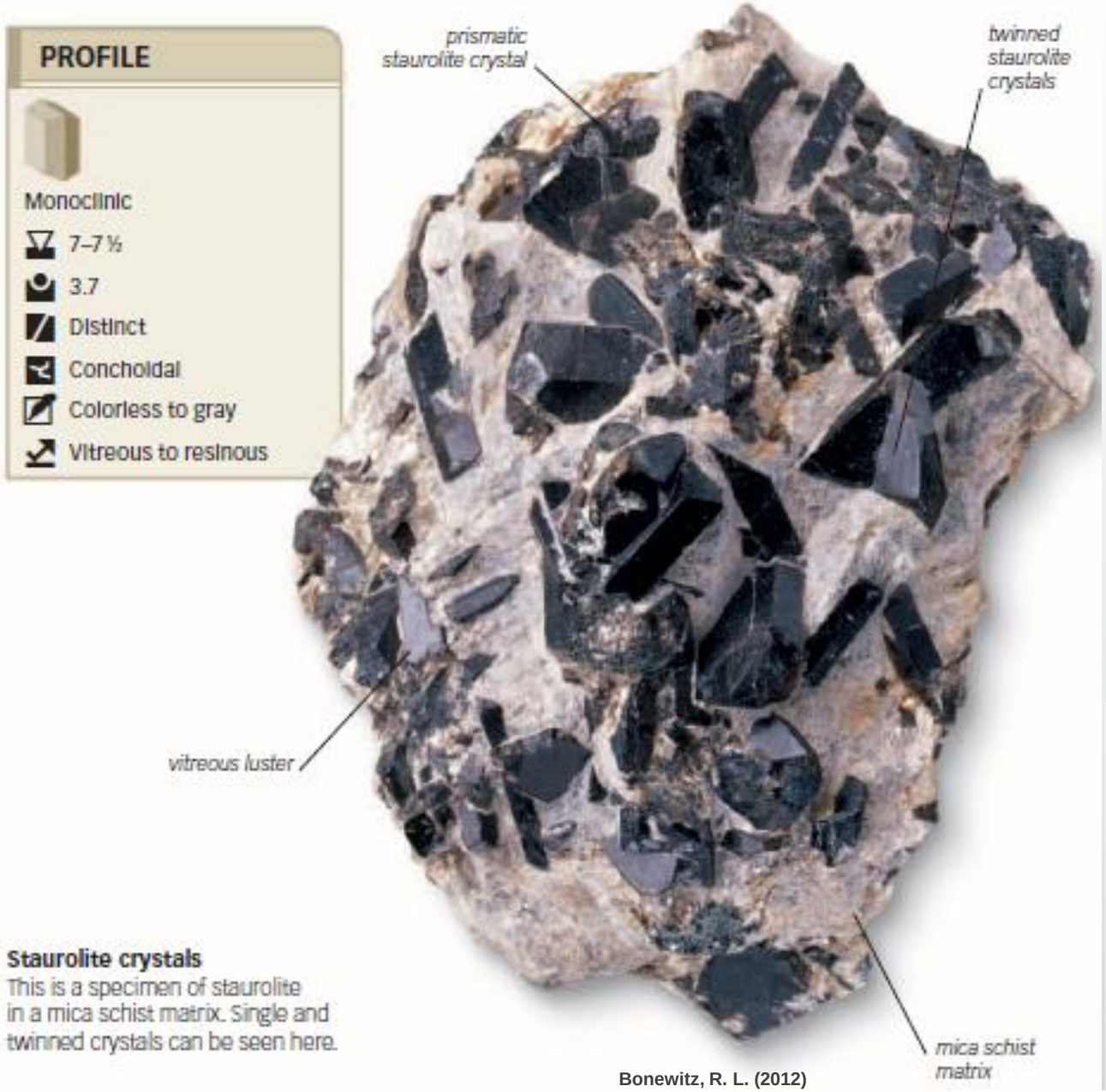
Prismatic sillimanite
In this specimen, elongated, prismatic crystals of sillimanite can be seen in a rock matrix.

Collectors' gem
Facet-grade sillimanite, such as this specimen, occurs in the gem gravels of Sri Lanka and Myanmar, and in Brazil.

Bonewitz, R. L. (2012)

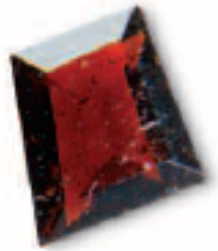
STAVROLİT

Kimyasal Formülü	$(FeMg)_4Al_{17}(SiAl)_8O_{45}(OH)_3$



Staurolite crystals
This is a specimen of staurolite in a mica schist matrix. Single and twinned crystals can be seen here.

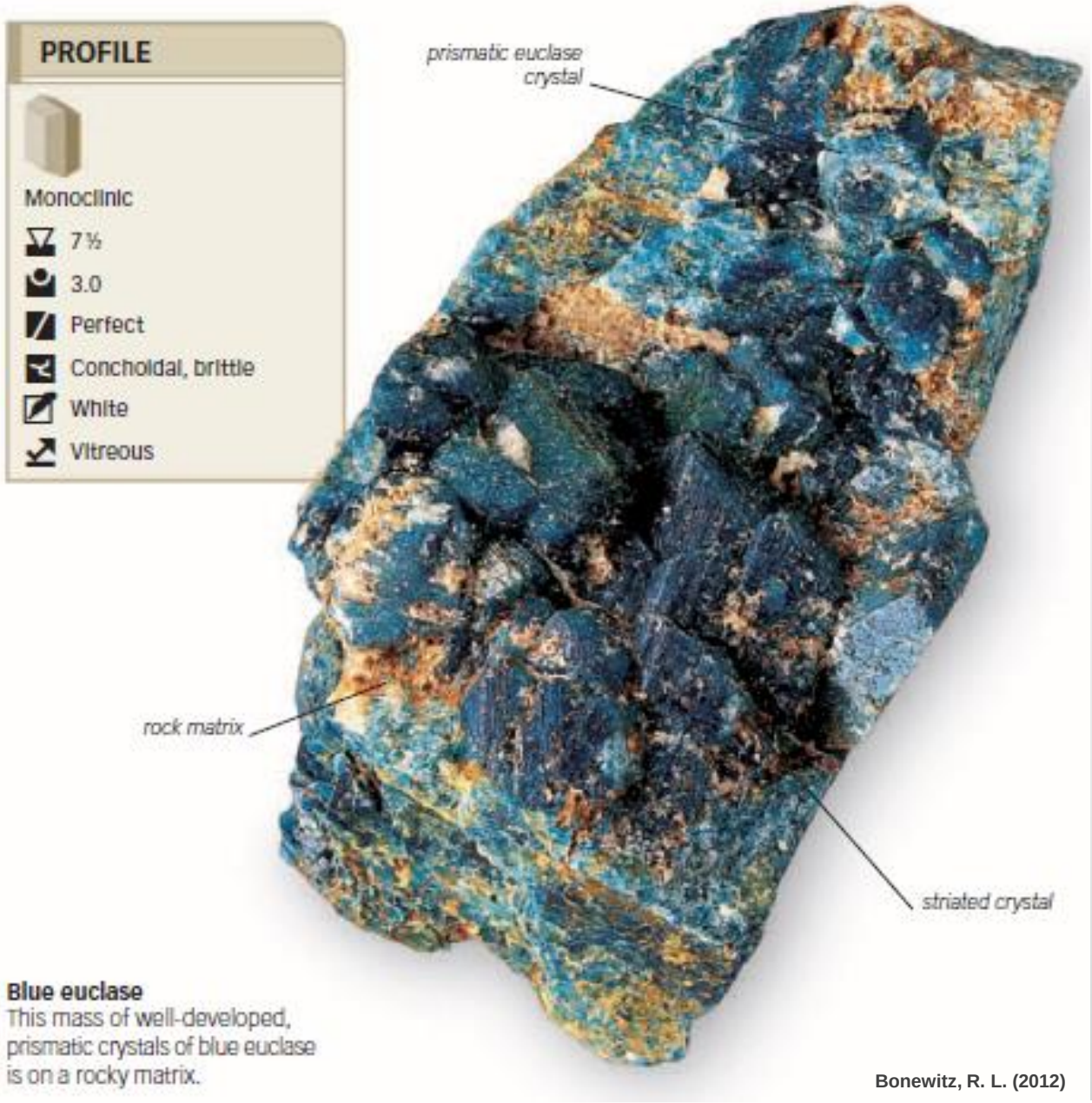
Bonewitz, R. L. (2012)



Trapeze-cut staurolite
Transparent staurolite, as in this stone, is a rare faceting material because of its dark color and lack of brilliance.

ÖKLAZ

Kimyasal Formülü	$BeAlSiO_4(OH)$



Blue euclase
This mass of well-developed, prismatic crystals of blue euclase is on a rocky matrix.

Bonewitz, R. L. (2012)

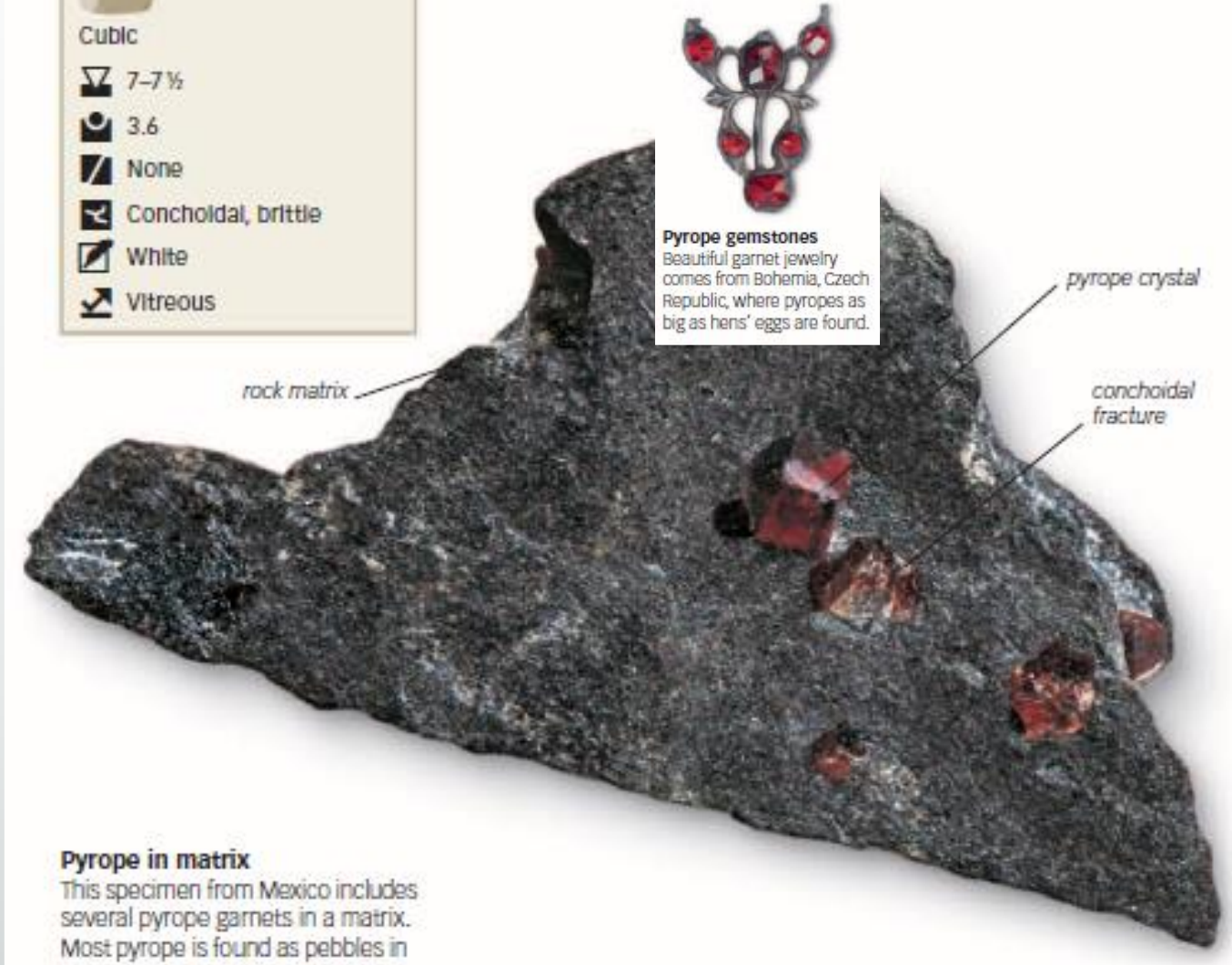
Euclase gemstone
This square-cut euclase gemstone shows small, dark inclusions of another mineral.

GRANAT

Kimyasal Formülü	$Mg_3Al_2(SiO_4)_3$

PROFILE

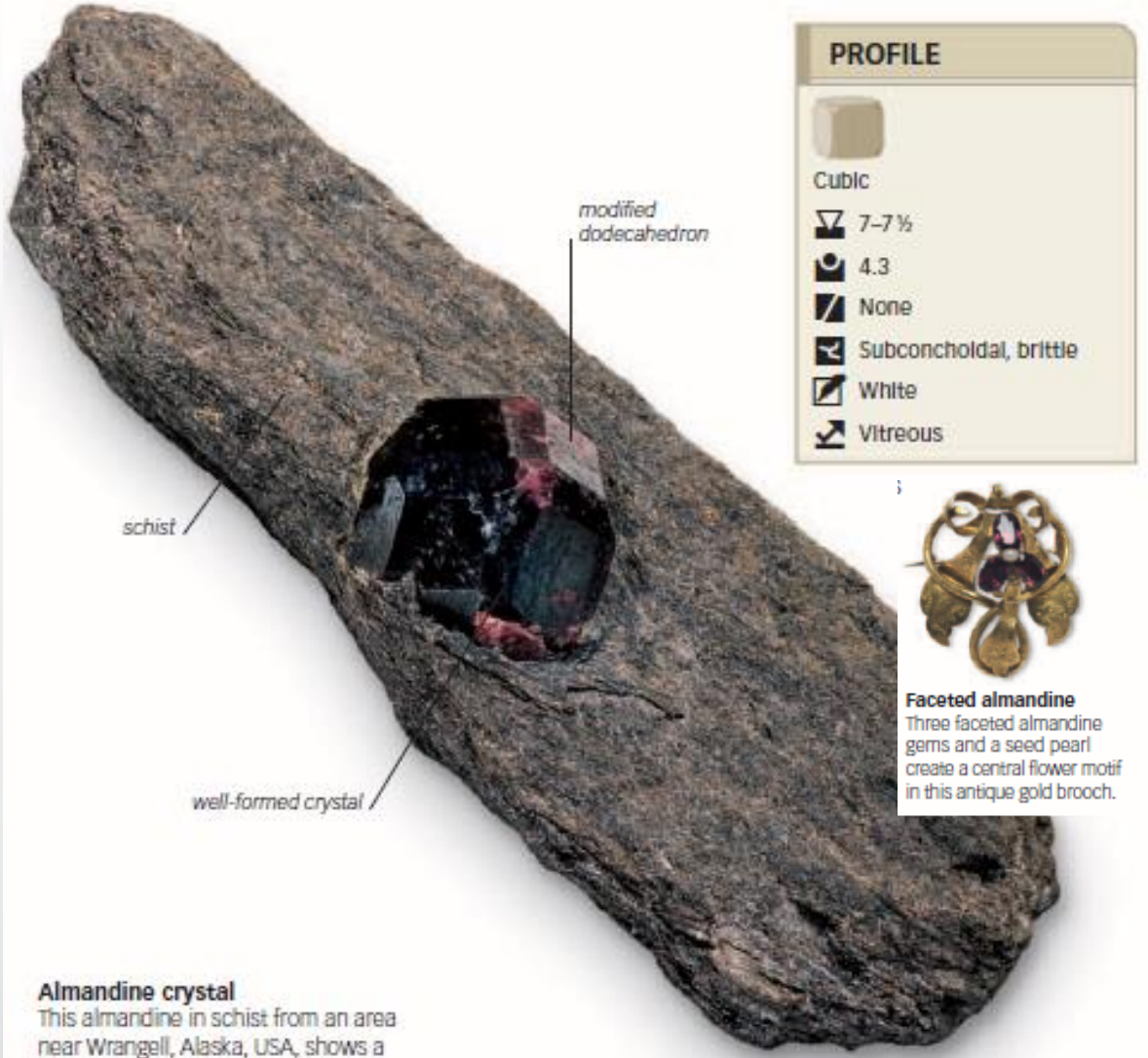
Cubic
7–7½
3.6
None
Concholdal, brittle
White
Vitreous



Pyrope gemstones
Beautiful garnet jewelry comes from Bohemia, Czech Republic, where pyropes as big as hens' eggs are found.

Pyrope in matrix
This specimen from Mexico includes several pyrope garnets in a matrix. Most pyrope is found as pebbles in placer deposits with other gems.

Bonewitz, R. L. (2012)



PROFILE

Cubic
7–7½
4.3
None
Subconcholdal, brittle
White
Vitreous

Faceted almandine
Three faceted almandine gems and a seed pearl create a central flower motif in this antique gold brooch.

Almandine crystal
This almandine in schist from an area near Wrangell, Alaska, USA, shows a modified dodecahedral form.

Kimyasal Formülü	$Fe_3Al_2(SiO_4)_3$

GRANAT

Kimyasal Formülü	$Mn_3Al_2(SiO_4)_3$

Spessartine crystals
In this specimen from Norway, well-formed dodecahedral crystals encrust a rock matrix.

PROFILE

Cubic
7–7 ½
4.2
None
Concholdal, brittle
White
Vitreous

Octagonal step cut
Because of spessartine's rich color, the liquid inclusions under the edge facets in this gem are not very noticeable.

Bonewitz, R. L. (2012)

Kimyasal Formülü	$Ca_3Al_2(SiO_4)_3$

PROFILE

Cubic
6 ½–7
3.6
None
Concholdal
White
Vitreous

Grossular on diopside
These grossular crystals from Piedmont, Italy, are set on a matrix of diopside.

Grossular beads
This strung group is made up of size-graded, round, luminescent green grossular beads.

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