Geology notes.

[s.l.]: [s.n.], [s.d.]

Azoic Time -
3000 - 5000 million yrs. ago - formation of earth

Pre-Cambrian Time - lasted 1000-1500 million yrs.

Archeozoic era - much volcanic
Proterozoic " - iron, copper. Glacial periods at least three
simple marine life

Paleozoic Era - invertebrates and marine forms -
lasted 300 million yrs.

Cambrian - began 505 million yrs. ago
Seas covered most of world
marine invertebrates - shells, calcareous
marine algae. Some lichens.

Ordovician - lasted 65 million yrs. - first
primitive fish-like vertebrates
deposition of marbles, limestones, slates

Silurian period → began 360 million yrs. ago
lasted 35 million yrs.
seas - great salt beds deposited -
great changes in U.S.
Beginnings of land plants.

Devonian period - began 325 million yrs. ago
lasted 65 million yrs.
Volcanic activity
Age of fishes
Wingless insects + spiders
Ferns, mosses, horsetails
Tree fern forests + primitive evergreens

Carboniferous - began 280 million yrs ago. Lasted
50 million yrs. Almost 80% of world's
coal beds formed from marshy vegetation.
Air warm & moist - fish abundant.
Giant dragonflies.

Permian - began 230 million yrs ago, lasted
25 million yrs. Land rose. Widespread
aridity - deserts formed. Reptiles & fishes.

Mesozoic Era - Age of Reptiles - lasted 130 million yrs.
dinosaurs, many bipedal. Vertebrate animals.

Jurassic period - dinosaurs, reptiles

Cretaceous → chalk period. Coal & oil in
western US. At close of this period

dinosaurs became extinct.

Cenozoic Era - mammals & modern seed plants
75 million years, length of period
Horse 1 ft. high

Paleocene & Eocene - modern birds. Seed-bearing plants

Oligocene → Mammals dominant: Cat & dog families supreme. Primitive anthropoid ape. Primates walked erect

Miocene - volcanic activity - Modern birds. Great apes in Europe.

Pliocene - Land still rose. Horse evolved almost to modern form. Manlike apes - gibbon, gorilla. Beginning of Stone age: earliest implements of man, antedating any skeleton of man himself thus far discovered.

Pleistocene - Glaciers - disappeared in NY 38,000 yrs. ago & from Sweden 12000 yrs. ago. Great Lakes formed when ice last disappeared. Four species elephants in N. A. including mastodon & mammoth - also camels, sabretooth tiger; camels & horse survived glacial eras but died out in U.S. before advent of man. Beginning extinction of mammals & rise of man. (Cro-magnon man was known for cave paintings)

Recent - began 25,000 yrs. ago. Most glaciers melted & lands became warm. Deserts. Neolithic man developed roughly 20,000 yrs. B.C. Civ. began - pottery, community life, agriculture. Domestication of animals. Copper & bronze age began 5000-2000 B.C. and Iron age 3000-800 B.C.

The rock-making minerals: quartz, feldspar and mica.

granite pegmatites — in these we find minerals containing beryllium, tin, tungsten, tantalum, fluorine, & boron. ~~as residual elements~~ Sometimes we find that these pegmatites ("simple pegmatites") were later attacked by solutions containing other rare & more volatile elements, & that the early normal pegmatite minerals, those of granite as a rule, have given way. The feldspars richer in lime, and that lithium has entered into the mica, and that caesium has replaced some of the beryllium in beryl.

As rocks weather — wear away, some resistant minerals like quartz persists.

Some of the metal elements go into solution & are later deposited on the sea. Even in fossils we may find quartz or pyrite linings.

The Silica Group — Hexagonal

Commonest of minerals, found in every class of rocks & forming under all sorts of conditions. A type of quartz is chalcedony — the banding is obvious in the kind called agate. The chert, flint & jasper also have microscopically grained quartz but not the definite banding & translucency of the chalcedony group & usually have more impurities.

They may occur anywhere. High-temp. veins usually coarsely crystallized, low-temp in sed. rocks may show one of the fine-grained varieties.

Rose quartz as a pegmatite mineral & crystals are scarce. The failure to find large-well-formed crystals of rose quartz as a geological mystery.

The best agate forms in cavities in basaltic rock as in western US + in Rio Grande do Sul, Brazil.
Chalcedony + agate have decorative use but also valuable for bearings + in mortars. Flint is a black compact variety which once was valued for the sparks it gave when struck by steel, as in flintlock guns.
In Silica group also: Tridymite, cristobalite, opal, feldspars, orthoclase, microcline, plagioclase, leucite,
Sodalite is a mineral of alkaline igneous + plutonic rocks, low in silica, + Serpentine.

Mica group - Muscovite etc.
garnets; epidote group.

Igneous + Plutonic rocks: Diabase found in Minn.
Difficult to see the feldspars elongated crystals in it.
Syenite (Ontario) light-colored rocks consist mainly of potash feldspar, without the quartz grains that would make it a granite. Some syenites are very dark, but all show less sparkling than the granites they resemble. Basalt (Minn) squeezed its way sometimes in between coarser walls of granitic rock after that was cool, probably many geological periods afterwards.
Syenite is mainly potash feldspars with some mica or hornblende. Can be found at Wausau, Wis.
Crystalline limestones are closely akin to marbles but are considered sedimentary rocks when there is no indication of deformation by pressure. Like
Quartzite is metamorphosed sandstones.
marble is a massive Hard very hard + tough.

granite (Minnesota) is grey & salt & pepper with tiny sparkles

griffon - built 1678 - 1st sailing ship on Great Lakes
Sailed from Mackinac Island Aug. 7, 1679.
Among Here she set out for Washington Island, Wis where a large cargo of furs was shipped. On Sept. 18 she headed out of Detroit Harbor & was never heard of again. Either lost in storm or taken by Indians

Descent of NOTES on BACK

Wausau granite - reddish with black specks
Quartzite (Huronian) - Sandstone peach-brown
Copper - chalky, bright copper-brown
corals are found color & look spongy
Fossil, seaweed - (mine = Leech Lake?)
→ When left on the ground copper takes on a green color due to the formation of copper salts
Copper Indians occupied Wis. = about 3000 to 500 BC Isle Royale L.S. copper
Azurite with malachite (Arizona)
& Magnetite (Ontario)
Feldspar in hornblende
Lazurite (Colorado)
Rose quartz (!) S.D.
Malachite - black (navy?) with green rings
~~Sodalite - fading in sandstone~~ S.D.
~~color be beautiful~~

Nov. 4, 1779 H.M. Sloop o' War Felicity sailed sailed & anchored at Milw. Here a village of mixed tribes & some Frenchmen whose loyalty & the British King was highly suspect.

Solomon Juneau came to Milw. in 1818. By 1822 he had built his own cabin along the river approx. on E. Wis. Ave. first trader of Milw.
1846

Black Hawk · captured at Ft. Crawford (Prairie du Chien) in 1832. Taken to Washington, D.C. & return. Died on Iowa in 1838.

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basalt - gunmetal, rough, chalky looking
Gneiss - grey & light (striped?)
Schist - blackish rough looking
marble is white
slate - tan-copper-beige, smooth, no sparkles
Shale - grey, no sparkle
Sandstone - peach-tan - I think has tiny sparkle to it
chert - a kind of light-greyish-white
Quartzite - grey but when look at it close - a lavender-grey sort of tiny mottled, no shine

When corundum is intimately mixed with magnetite, the product is emery.

Hauyrite - a feldspar mineral constituting most of the composition of lapis lazuli which is marked by white streaks of calcite & golden flecks of pyrite & was known in antiquity as sapphire.

Sodalite, a sodium-aluminum silicate. Masses of it found in Canada on Ice River near Kicking Horse Pass, B.C. A member of a group of minerals that take the place of feldspar in certain rocks that are deficient in silica.