

AD, CE, BC, BP, calendar years, radiocarbon years, and all that

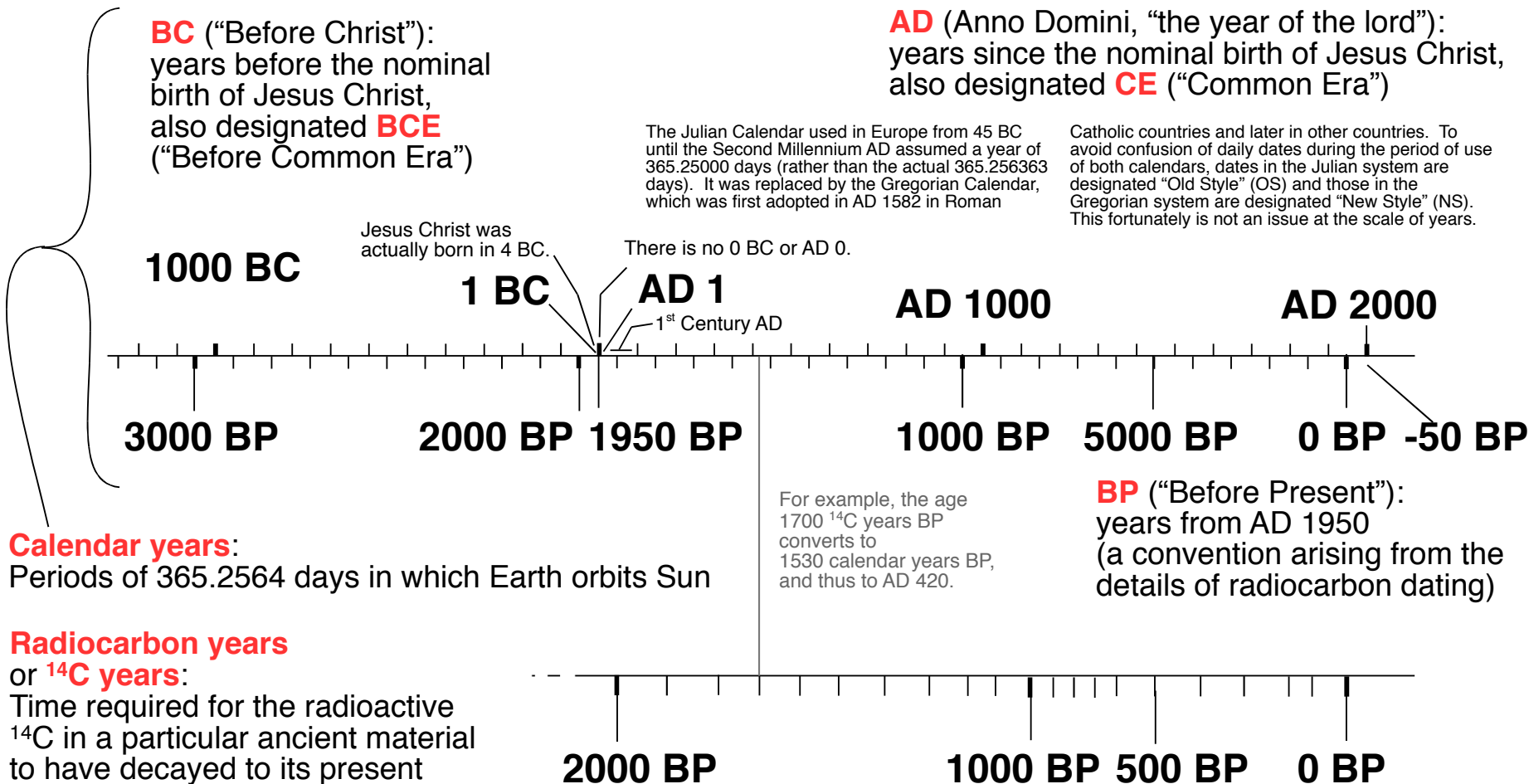
BC ("Before Christ"): years before the nominal birth of Jesus Christ, also designated **BCE** ("Before Common Era")

AD (Anno Domini, "the year of the lord"): years since the nominal birth of Jesus Christ, also designated **CE** ("Common Era")

The Julian Calendar used in Europe from 45 BC until the Second Millennium AD assumed a year of 365.25000 days (rather than the actual 365.256363 days). It was replaced by the Gregorian Calendar, which was first adopted in AD 1582 in Roman

Catholic countries and later in other countries. To avoid confusion of daily dates during the period of use of both calendars, dates in the Julian system are designated "Old Style" (OS) and those in the Gregorian system are designated "New Style" (NS). This fortunately is not an issue at the scale of years.

Jesus Christ was actually born in 4 BC. There is no 0 BC or AD 0.



Calendar years:
Periods of 365.2564 days in which Earth orbits Sun

Radiocarbon years or ¹⁴C years:
Time required for the radioactive ¹⁴C in a particular ancient material to have decayed to its present proportion relative to the stable ¹²C and ¹³C in that material, *assuming* that the ¹⁴C concentration of the atmosphere when that ancient material formed was the same as that of the modern (late 1940s) atmosphere. That assumption is not valid in detail,

For example, the age 1700 ¹⁴C years BP converts to 1530 calendar years BP, and thus to AD 420.

BP ("Before Present"): years from AD 1950 (a convention arising from the details of radiocarbon dating)

so that measured ¹⁴C ages must be converted to calendar ages. Conversion from ¹⁴C years to calendar years is called "calibration" of the age. Two further *SFMG* pages address that topic.

One bit of good news is that U-Th or ²³⁰Th dating requires no calibration – it yields ages in calendar years. Those ages were commonly expressed relative to the time of analysis but are more recently expressed as years BP.