## Aging of the atmosphere and radiocarbon dating

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The natural variability of atmospheric <sup>14</sup>C has been significantly altered by anthropogenic activities linked to technological advancements and energy consumption over the past two and a half centuries. The Suess effect, a consequence of the combustion of old carbon (fossil fuels) since the mid-18th century and the bomb peak from the thermonuclear tests of the mid-20th century, have obscured the natural <sup>14</sup>C signal in the atmosphere. The bomb peak i.e., the excess of <sup>14</sup>C carbon was produced in the atmosphere in the years between 1952 to 1963. The higher-than-natural levels of <sup>14</sup>C in the atmosphere were detectable between 1954 and 2021. Measurements of <sup>14</sup>C in the air and in the leaves or tree rings allow reconstruction of the changes that are results of the Suess effect. The fading of the bomb peak and future scenarios of the atmospheric <sup>14</sup>C levels are of concern for the future applications of the dating method. This paper presents an overview of <sup>14</sup>C applications which rely on the bomb peak and the consequences of a 'dark atmosphere'.