

## b8 The Quaternary subdivided into the Holocene and Pleistocene epochs < Ice Ages >

We ought, indeed, to have paused before we first adopted the diluvian theory, and referred all our old superficial gravel to the action of the Mosaic Flood. For of man, and the works of his hands, we have not yet found a single trace among the remnants of a former world entombed in these deposits.

— Sedgwick, *Presidential Address* (1831).<sup>1</sup>

The discovery of a human jaw, made by M. Boucher de Perthes in April 1863 in the Quaternary deposits of Moulin-Quignon near Abbeville, added to the mass of facts previously known, which revealed the existence in those same deposits of traces of human industry such as flint axes, and remains of hearths and pottery, has established in a striking manner that man existed during the Quaternary period [before the Recent Age of historical time, i.e. during Paul Tournal's *période antehistorique*] and before the Asiatic Deluge.

— Louis Figuier (1819-1894).<sup>2</sup>

During historical times, civilizations have come to be and some are in ruins and some which became buried have been exhumed by archeologists. The Recent (historical time) began about 6000 years ago. Before, the Holocene (the most recent epoch of prehistorical time), a time of sealevel rise, began 11,800 years ago when the last Pleistocene “glacial” ended. Earth is still physically recovering from several Pleistocene events. So, Agassiz’s hypothesis of an Ice Age is testable:

Earth’s solid surface is rebounding where relieved of the immense weight of glacial ice that weighed it down during the last Pleistocene glacial (*see* Topic b14).

Salt lakes exist today in semiarid regions where, during glacials, cooler climate (and so less evaporation) allowed extensive (pluvial) lakes to exist (*see* Topic b20).

In temperate climatic zones, evidence of former periglacial, tundra, climatic conditions corroborate the former presence of continental ice sheets at low latitudes (*see* Topics b21 and b24).

In proportion to ice volumes held on the land, eustatically lowered sealevels during glacials globally exposed continental shelves to erosion (*see* Topic b22).

The time since the onset of the Ice Ages is called the *Quaternary Period*. That numeration (“4” by Jules Desnoyers in 1829, *see* Topic c20) testifies to a recognition of the existence of earlier durations of prehistory. Glacial ice has been at its present (diminished from its vast prehistoric) extent, and mean sealevel has been stable, since 6000 years ago. The Pleistocene Epoch ended 11,800 years ago when the climate warmed abruptly to its historically experienced condition and sealevel began its rise by some 105 meters due to additions of glacial ice meltwater (*see* Topic b22). The last bitter cold of the Ice Age, named the Younger Dryas, ended through 60 years 11,800 (~10,000 <sup>14</sup>C) ago and onset through 200 years 12,900 years ago.<sup>3</sup> This millennial long “cold snap” (possibly forced by Keewatin ice-dome melt discharge via the Arctic ocean and Fram strait)<sup>4</sup> interrupted a warming trend (Bølling and Allerød periods) that began abruptly though 1-3 years 14,700 years ago<sup>5</sup> ending then the last (most recent) glacial (named the Wisconsinian in North America—*see* Topic b16, and the Würm in Europe) of the many that have been since 1,806,000 years ago<sup>6</sup> (the beginning of the Pleistocene Epoch) or 2,588,000 years ago (the beginning of the Gelasian Age).

The Quaternary Period, the last, and the shortest, of the geological periods of time is subdivided as follows:

Quaternary Period	Recent Age	6000 years ago	Historical time	I C E A G E S
	Holocene Epoch	11,800 years ago	Younger Dryas	
	Pleistocene Epoch	12,900 years ago	-----	
	Gelasian Age	1,806,000 years ago	-----	
		2,588,000 years ago	-----	

