

Transmitted with  
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 From the Director

V.F.: Geology

MAJOR DIVISIONS OF GEOLOGICAL TIME FOR USE BY THE NATIONAL PARK SERVICE\*

ERA	PERIOD OR SYSTEM	EPOCH OR SERIES	APPROXIMATE NO. OF MILLION YEARS AGO
Cenozoic	Quaternary	Recent	0 - 1
		Pleistocene	
	Tertiary	Pliocene	1 - 10
		Miocene	10 - 25
		Oligocene	25 - 40
		Eocene	
Mesozoic	Cretaceous	Late (Upper)	60 - 125
		Early (Lower)	
	Jurassic	Late (Upper)	
		Middle (Middle)	125 - 150
		Early (Lower)	
	Triassic	Late (Upper)	
		Middle (Middle)	150 - 180
		Early (Lower)	
	Paleozoic	Permian	Provincial series recognized in west Texas and southeast New Mexico
Pennsylvanian		Late (Upper)	
		Middle (Middle)	
		Early (Lower)	205 - 255
Mississippian		Late (Upper)	
		Early (Lower)	
Devonian		Late (Upper)	
	Middle (Middle)	255 - 315	
Silurian	Late (Upper)		
	Middle (Middle)	315 - 350	
	Early (Lower)		
Ordovician	Late (Upper)		
	Middle (Middle)	350 - 430	
	Early (Lower)		
Cambrian	Late (Upper)		
	Middle (Middle)	430 - 510	
Precambrian	Note: Subdivisions are dropped.	Informal subdivisions such as upper, middle, and lower, or upper or lower, or younger and older may be used locally	510 - 3000+

about 20%

about 80%

\*Compiled by Bennett T. Gale, 10/28/57, from information furnished by the Geologic Names Committee of the Geological Survey in 1957.

The formal terms "Early", "Middle", and "Late" refer to geologic time. Corresponding terms of "Lower", "Middle", and "Upper" should be used in describing rocks of those ages. No formal subdivisions of Precambrian time are recognized.

Archeozoic, Proterozoic, Archean & Algonkian no longer used

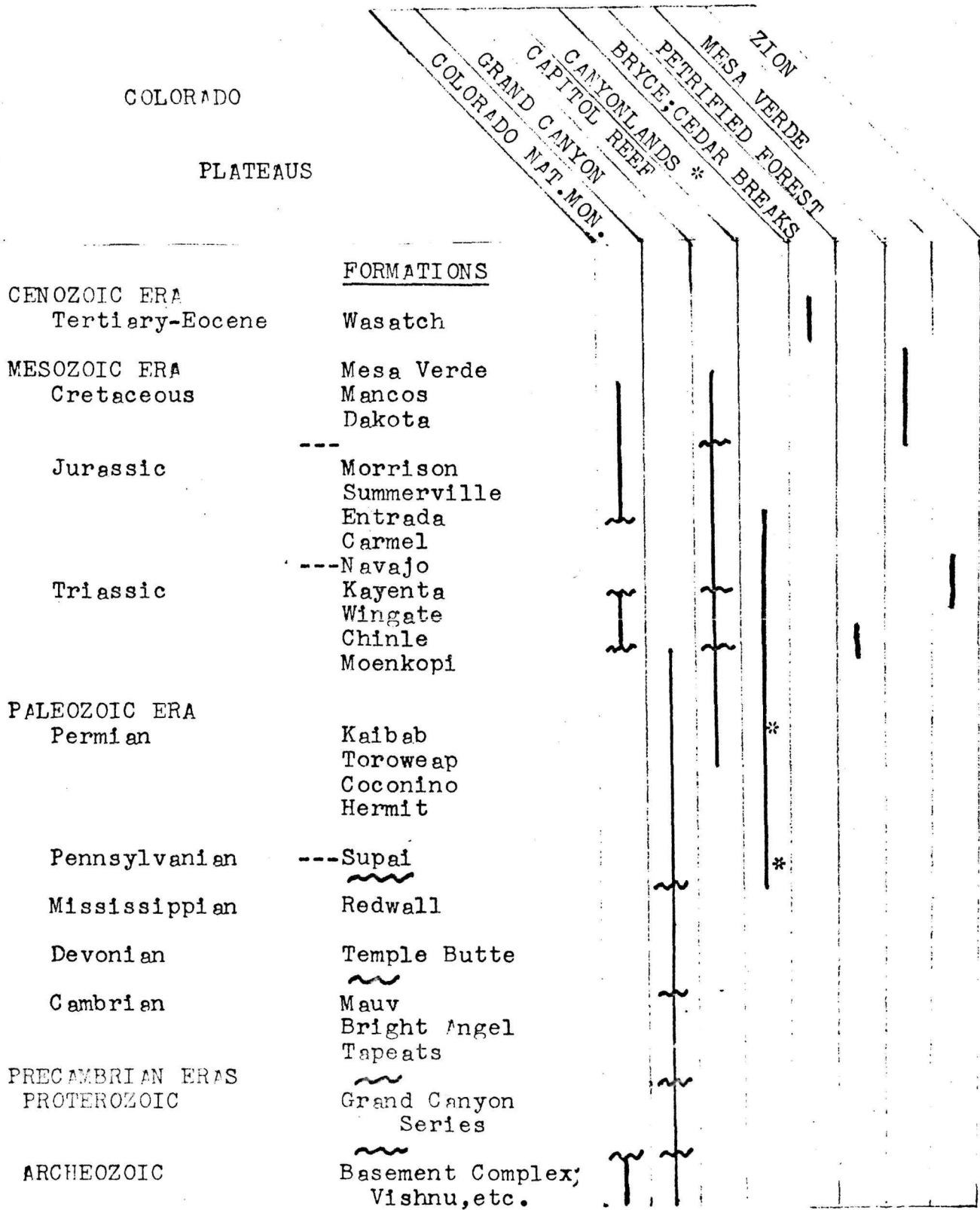
PERISTOCENE CHRONOLOGY		WISCONSIN AND RECENT	
Years Ago	Stage*	Years Ago	Substage
			Recent Advances
25,000	Wisconsin	4,000	"Little Ice Age"
50,000			Altithermal
75,000		8,000	Cochrane (7,500) (Canada only)
100,000	Sangamon (interglacial)		
		12,000	Valders (Mankato) * (11,000)
	Illinoian		
		16,000	Cary (14,500)
	Yarmouth (interglacial)		
		20,000	Tazewell (18,000)
200,000	Kansan		
		24,000	Iowan (21,500) **
	Aftonian (interglacial)		
		28,000	Farmdale (25,000)
300,000	Nebraskan		

\* Dating shown represents maximum advance or retreat

\* Mankato has been correlated with Valders but recent dating indicates that the Mankato is older.

\*\* Recent C14 dating of Iowan till in Iowa suggests it is older than Farmdale, perhaps 28,000 to 65,000 years old.

PRINCIPAL FORMATIONS IN SELECTED PARKS AND MONUMENTS



\* Cutler-Rico-Hermosa Fms. replace Permo-Penn. Grand Canyon section  
 Note: Local formations are not included; ~ - Unconformity