IV. Ecosystem Ecology

A. Energy Flow

1. Food chains
2. Productiion
    a. gross primary productivity
    b. net primary productivity
3. Consumption
    a. ecological efficiency
4. Decomposition
5. Trophic pyramids
6. What determines productivity

Rocky intertidal community

Simplified food web of a rocky intertidal community

Pisaster (sea star)

Thais
(snail)

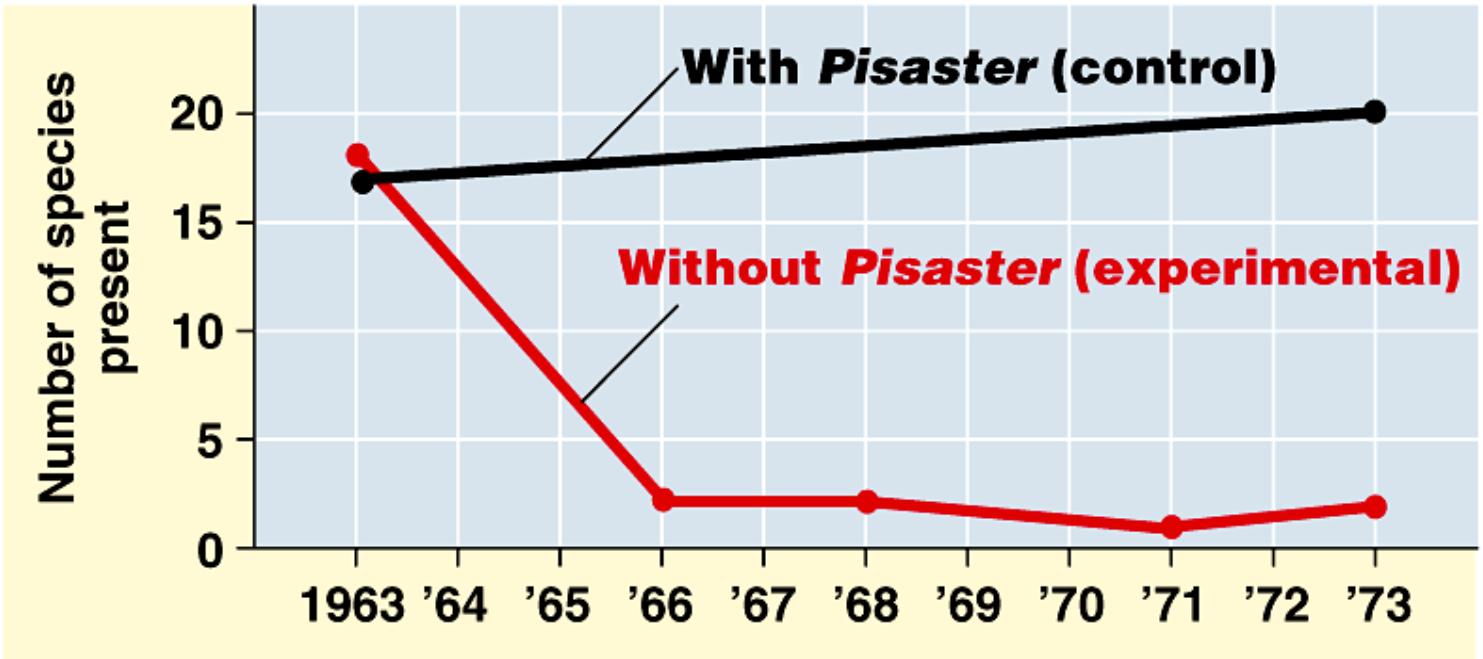
Chitons
2 sp

Limpets
2 sp

Bivalves
(Mussels)

Acorn
Barnacles
3 sp

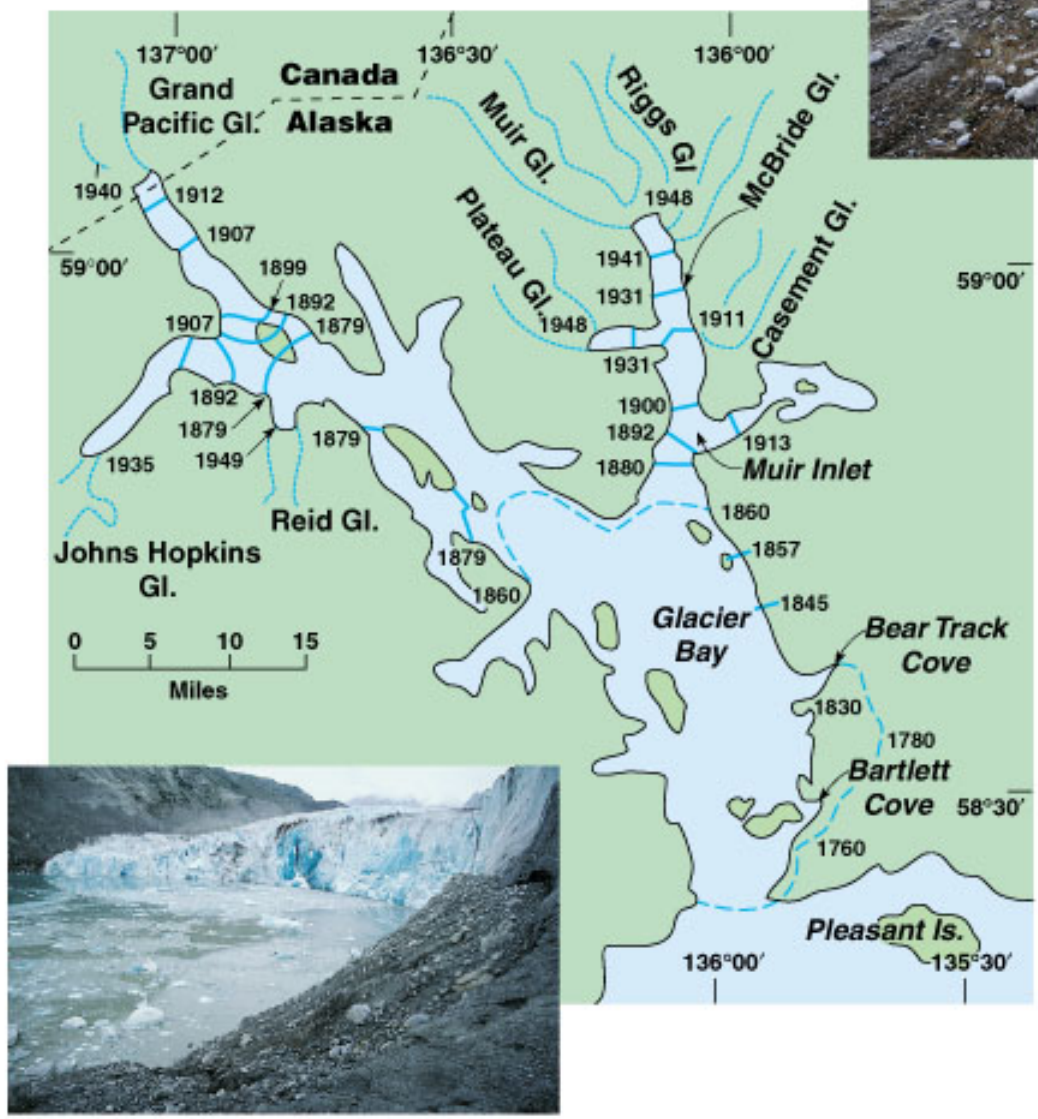
Goosenecked
Barnacles
1 sp



(b)

Disturbance

Fig. 53.19 Succession on glacial moraines



Retreating glacier with moraine to right

Table 53.2 The Pattern of Succession on Moraines in Glacier Bay

Years after Deglaciation	Dominant Plant	Other Common Species
0–30	*Dryas*	Fireweed, willows, mosses, cottonwoods
30–80	Alder	Willows
80–200	Sitka spruce	Alder, willows
200–300	Sitka spruce, western hemlock	Mountain hemlock
> 300	Sphagnum moss (in flat areas)	Bog plants

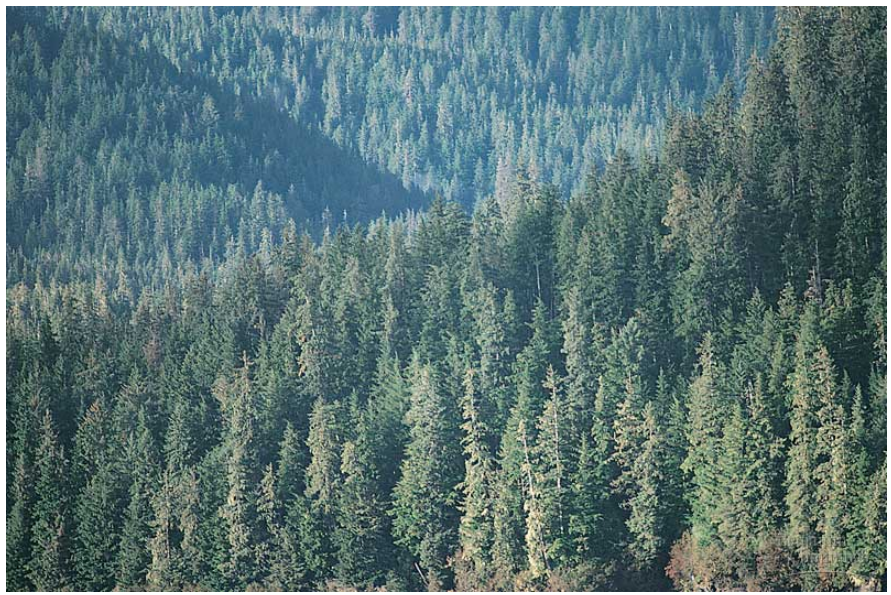
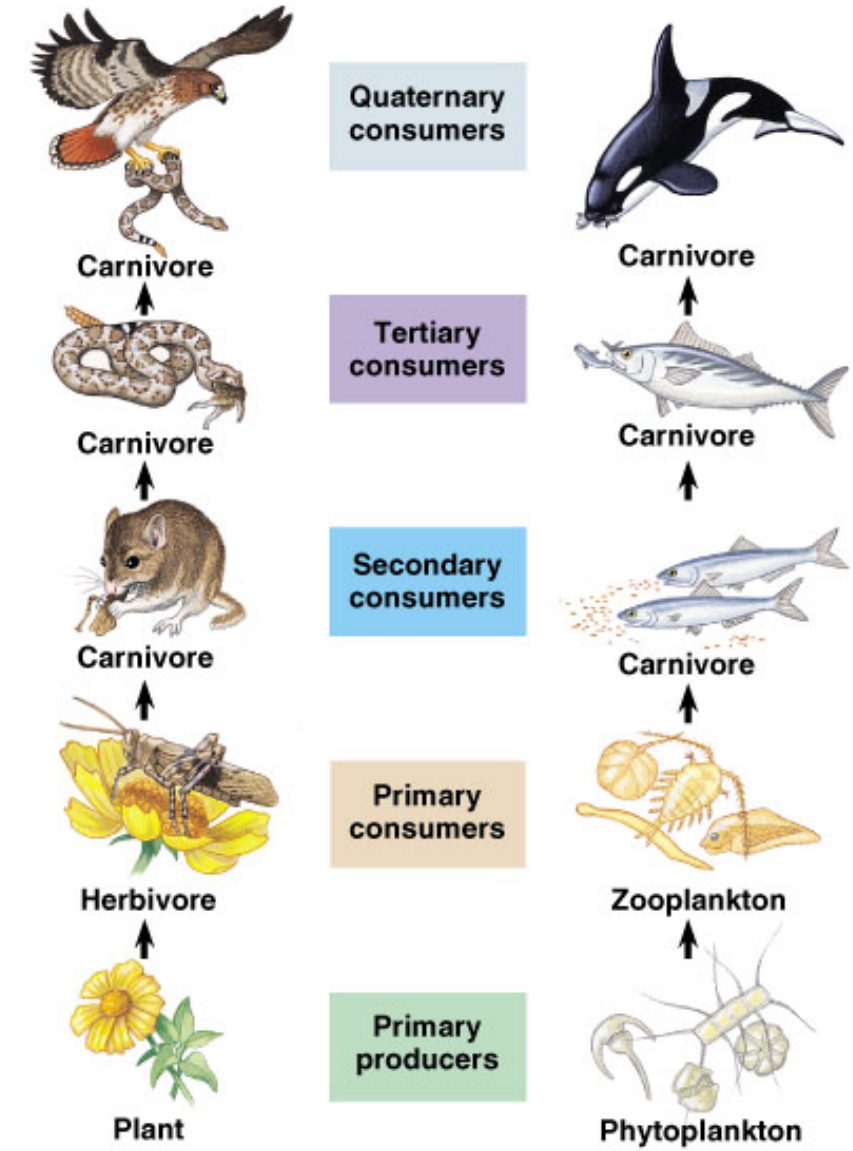


Fig. 53.10



Primary producer = plants (and other photosynthetic organisms)

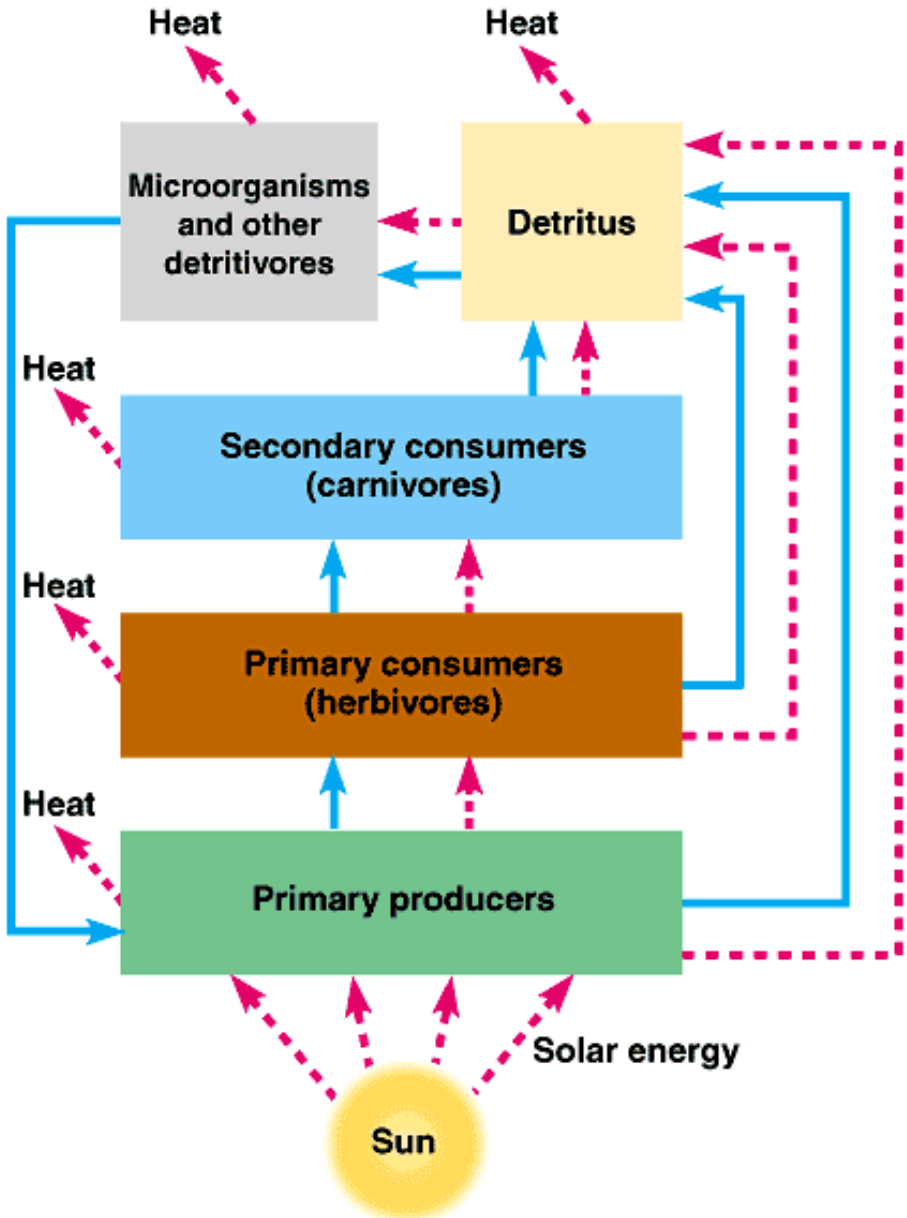
Primary consumer = herbivore
(things that eat producers)

Tertiary consumer = carnivore

(animals that eat secondary consumers)

Omnivore = animal that eats from several trophic levels

Fig. 54.1



Detritovore = organisms that eat non-living organic matter

Respiration

$$6CO_2 + 6H_2O + Energy \rightleftharpoons C_6H_{12}O_6 + 6O_2$$

Photosynthesis

NPP = GPP - Respiration

Fig. 53.10

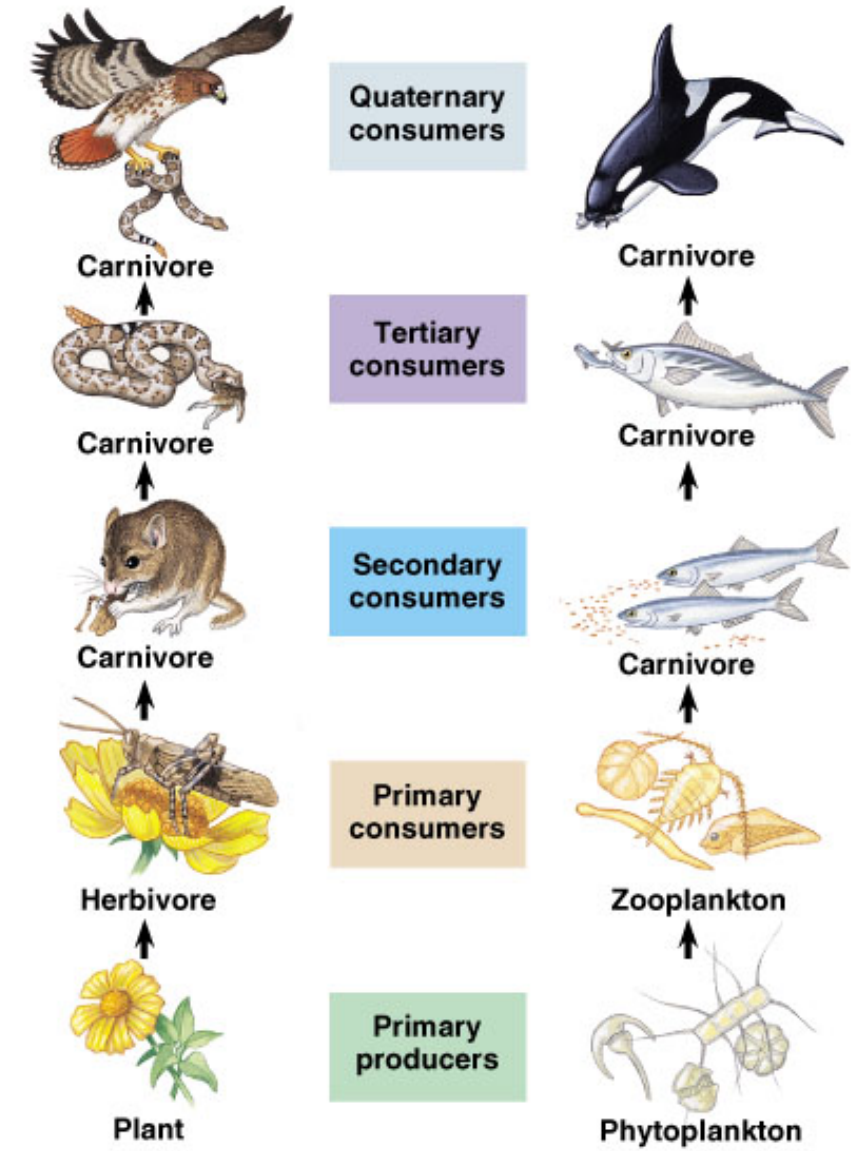


Fig. 54.10

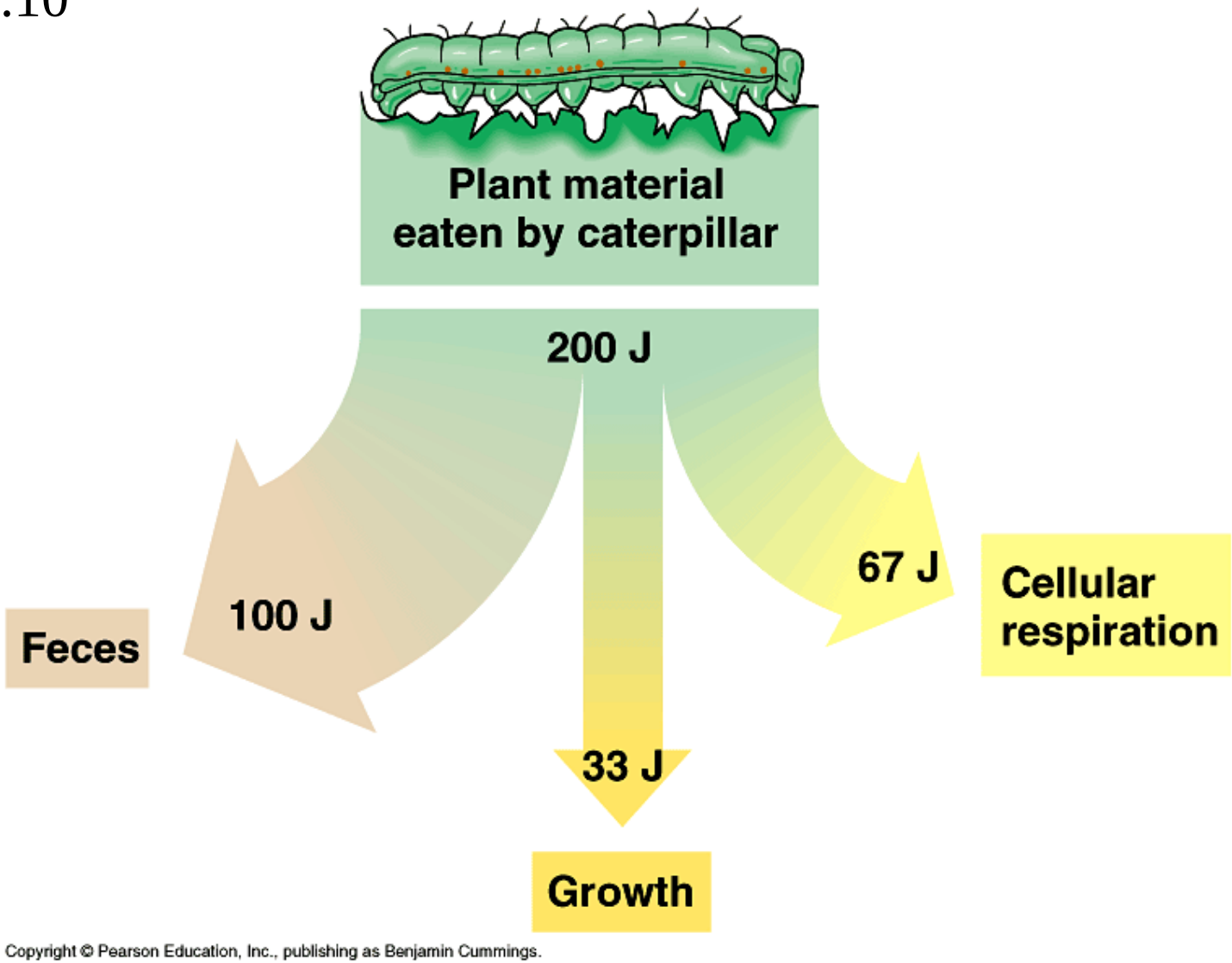


Fig. 54.11

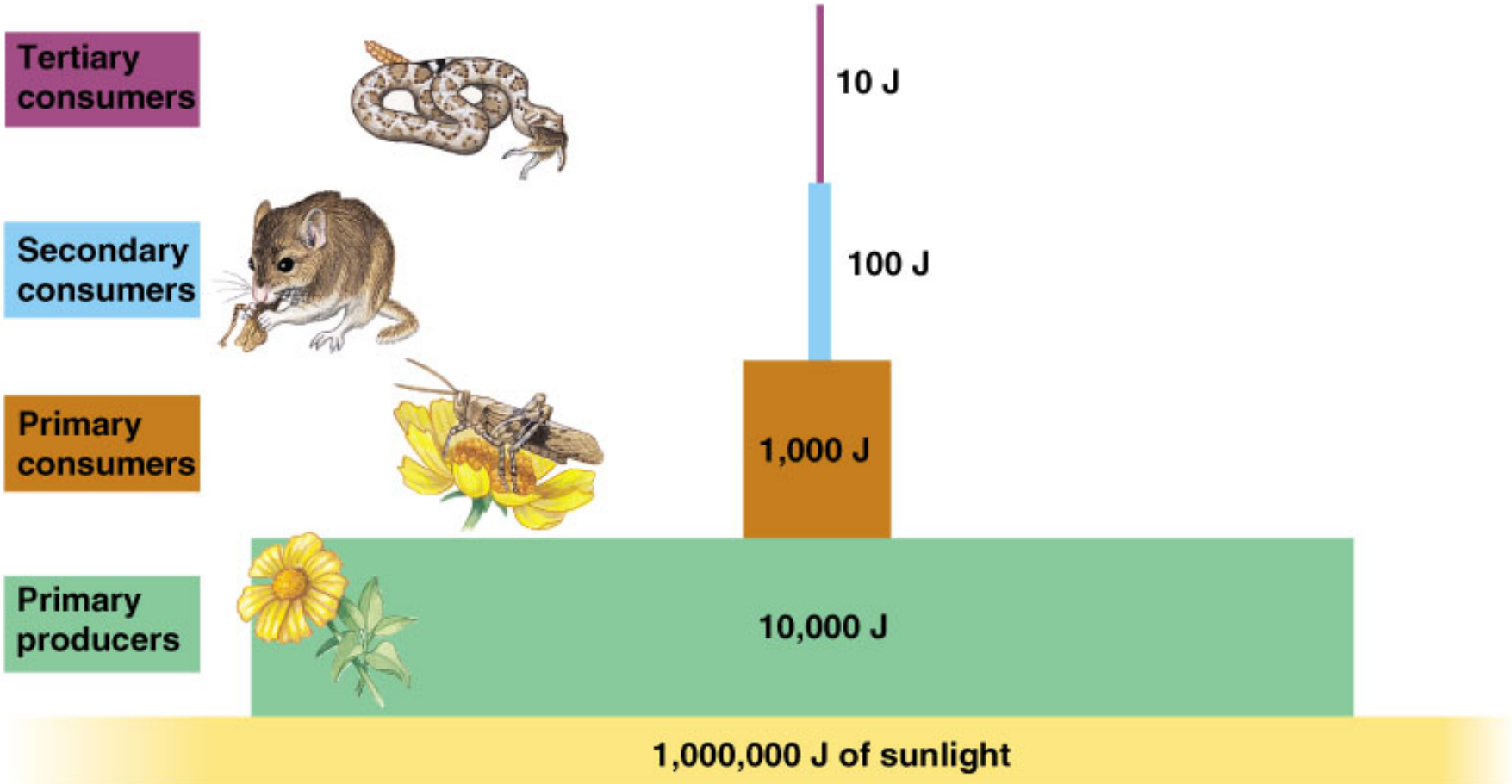


Fig. 54.14

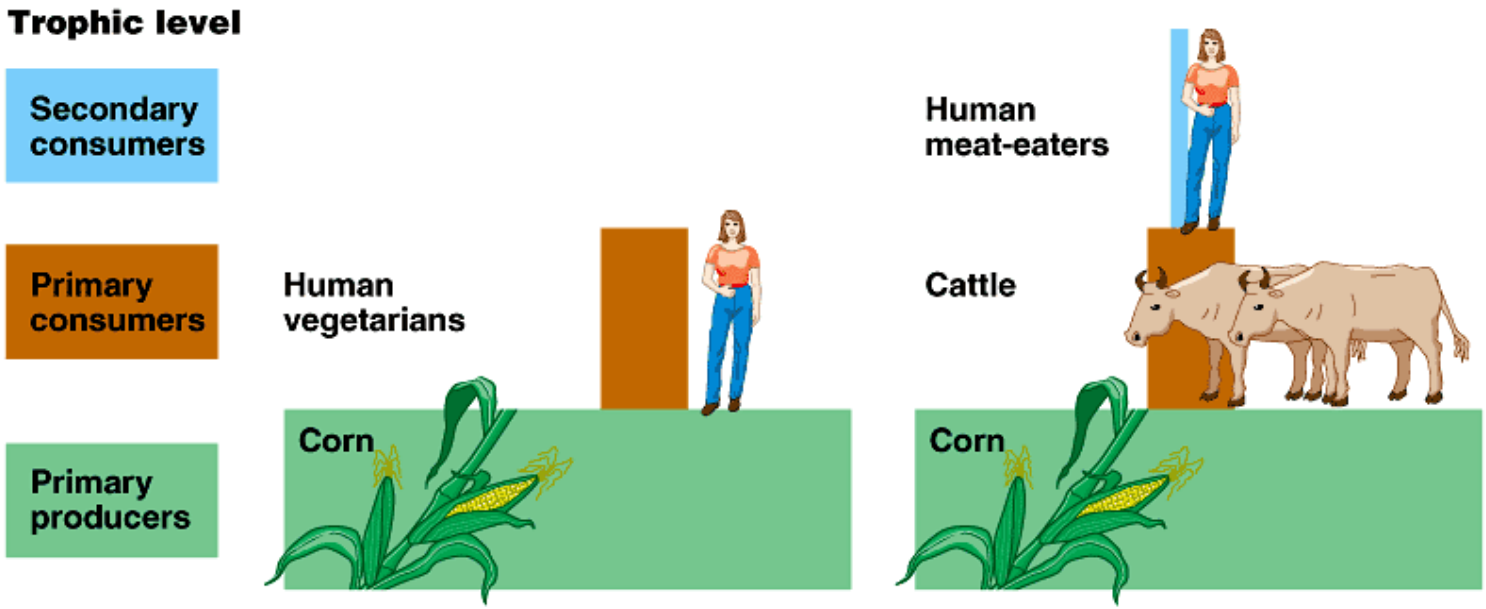


Fig. 54.3