

eastern coast has a plentiful supply of rain while the west becomes dry.

It is a well-known fact that as one ascends a mountain the temperature lowers and, if the mountain be very high, a point is reached above which are perpetual ice and snow. The altitude of this snow line varies with the latitude. Within the tropics it is higher than in the temperate zones. Because of this variation of temperature according to altitude, mountains within the torrid zone exhibit all variations of climate from perpetual heat to perpetual cold.

Lofty plateaus, especially in extra-tropical latitudes, are subject to greater extremes of temperature at opposite seasons than are experienced by lands of a different surface configuration. Being high and unsheltered they are exposed to the scorching sun of summer and the biting blast of winter.

**Prevailing Winds.**—Without doubt the most powerful agency in modifying the climate of a region is prevailing winds. The western coasts of countries in the line of the warm return trade winds have usually a higher average temperature, and possess a greater rainfall than corresponding eastern coasts. The presence of such winds accounts for the comparatively mild climates of Western British Columbia, of Ireland and Southern England, and of Western Norway.

The trade winds coming from cold into increasingly warmer regions have their capacity for absorbing and holding moisture much increased. When therefore they blow over wide stretches of level country and where there are no great elevations to bar their way they have the effect of parching the soil and rendering it barren. To such a cause, in no small degree, is owing the existence of the deserts of Lower Egypt, of Sahara, of Arabia, and of Australia.

**Proximity of the Sea.**—The sea is not so quickly raised in temperature as the land, and does not part with its heat so readily. Hence islands far from land, and the coasts of countries bordering on the sea, tend to have equable climates, as distinguished from the excessive climates of inland countries. The Philippines and the Hawaiian Islands, although situated within the torrid zone, have a climate of perpetual spring, and no excessive temperature such as is experienced in inland regions of corresponding latitude and altitude.

The influence of the sea on the temperature of the north-eastern coast of North America extends but a short distance inland. This is accounted for by the fact that the prevailing south-west wind blows from the land and not from the sea.

**Continental Climate.**—Apart from mountains and other elevations the land surface exerts a marked influence on climate. It absorbs and radiates heat readily and, as a result, fluctuations in temperature are numerous. In winter the temperature of land falls to a lower degree and more rapidly than does that of water, and in consequence the land in winter is colder than the water. In summer, owing to the rapid absorption of heat, the land is raised to a higher temperature than the water. Thus continental areas of land have excesses of temperature which islands or sea coasts do not experience.

### Life.

When life first appeared on the earth is not definitely known; but the conditions necessary to the support and development of life forms are known, and from these it can reason-

ably be inferred that if the nebular hypothesis is correct, long ages must have passed after the earth assumed its form, before its temperature had become sufficiently cooled to admit of the existence on its surface of life of any kind. From the fact that animal life is dependent for its sustenance upon plant life it may be safely inferred that animal life on the earth was preceded by plant life.

The plant organism may be considered as a laboratory in which the constituents of the soil and the air are chemically combined to form products suitable to its growth. Similarly the animal body may be considered as a laboratory in which, under certain conditions, the products of plant life are transformed into the constituents of the animal organism. Given the soil, moisture, and a suitable temperature, the plant sets to work, grows, and reproduces itself; but not so with the animal organism. Certain substances manufactured by plants are absolutely necessary to its existence.

The differences between the lowest forms of plants and animals are not easily determined, but between the higher forms they are very obvious. Both plants and animals are characterized by self-activity; but while plants move only in response to external stimulation and do not possess intelligence, all the higher animals possess the power of voluntary movement and the highest are capable of reasoning.

**Classification.**—On the basis of resemblance in form, structure, methods of reproduction, and general mode of life, plants and animals are each grouped into Orders, Genera and Species. A number of individuals possessing similar characteristics form a Species, a number of closely related Species constitute a Genera, and a number of closely related Genera form an Order.

### Classification of Plants.

- (1) **CRYPTOGAMS**—Flowerless plants.  
Moulds, Bacteria, Diatoms, Sea-weeds, Fungi, Algae, Lichens, Mosses, Ferns and Horsetails.
- (2) **PHANEROGAMS**—Plants producing flowers.  
(a) *Gymnosperms*—Seeds not enclosed in an ovary.  
Pine, Spruce, Cypress, Cedar.  
(b) *Angiosperms*—Seeds enclosed in an ovary.  
All the ordinary flowering plants.

### Classification of Animals.

- (a) *Invertebrata*—Animals without a backbone.  
Protozoa—Amoeba, Infusoria, Foraminifera.  
Porifera—Sponges.  
Coelenterata—Jellyfish, Hydra, Corals.  
Echinodermata—Starfish, Crinoids, Sea-urchins.  
Vermes—Worms.  
Arthropoda—Lobster, Spider, Centipede, Insects.  
Mollusca—Clams, Oysters, Snails, Cuttlefish.
- (b) *Vertebrata*.  
Fishes—Salmon, Shark.  
Amphibians—Frog, Salamander.  
Reptiles—Turtle, Snake, Lizard, Crocodile.  
Birds—Crow, Condor, Ostrich, Sparrow.  
Mammals—Kangaroo, Sloth, Elephant, Whale.

**Development of Life.**—An examination of these great groups will reveal a gradual increase in complexity of organism in passing from lower to higher forms. The earliest ancestors of our plants and animals consisted each of single cells without