ZOOLOGY

Fastest Evolution Areas

➤ EVOLUTION apparently proceeds fastest in coastal and mountain regions.

This is a new addition to evolutionary thought suggested by Dr. Alden H. Miller, director of the University of California's Museum of Vertebrate Zoology.

Marked differentiation within species has been previously noted in coastal and mountain areas, with their diverse climates and topographies. But the influence of such terrain in speeding the evolution of animals had not been elucidated.

Dr. Miller says that coastal and mountain regions along continental borders contain distinctly different environments within very short distances of each other. In a small area there may be sea level plains, foothills, valleys. or higher altitudes, with climates varying from relatively dry, wet, cold, to hot.

From a single species of animals there may develop a separate race especially suited to survive in each distinct environment. Each race tends to have a small population, and has a fairly strict geographical restriction. But at the edge of the habitat, individual animals have frequent contact with animals of adjacent races of the same species.

Each racial population supplies a small pool of genes which are tried out over and over again, giving the chance for new genetic characteristics to develop. At the same time, continual crossing with other races raises the chances for combinations with truly superior characteristics for survival.

Dr. Miller said these conditions provide maximum chance for animals to be different, and yet to take part in a "melting pot" in which genetic novelties can be exchanged.

The scientist said the song sparrow is a good example of how coastal and mountain terrain promotes this "evolutionary metabolism." Of 34 kinds of song sparrows in North America, only four kinds are found east of the Rockies. Thirteen are found in California—chiefly because of the coastal-mountain terrain.

Within the amazingly diverse conditions from the southern California deserts to the Aleutian Islands, the differences in song sparrows are great. The large size and other features of the Aleutian song sparrow compared to the tiny bird in the desert make the two seem like almost different species. Yet the birds are kin, and they maintain their kinship through the chain of relationships between races down the coast.

Dr. Miller said such processes seem to operate generally among animals. Primitive man probably was subjected to the same influences, but modern life is too complex to pin the matter down with present knowledge.

The scientist's theory appeared in the journal, *Evolution*.

Science News Letter, March 2, 1957

PLANT PHYSIOLOGY

Red Light Stops Plants

➤ THE discovery of a red light that means "stop" to plants may be second in importance only to photosynthesis itself, Smithsonian Institution scientists report.

The "brake" on plant development is a relatively narrow band of light on the edge of the invisible infrared of the solar spectrum, Dr. R. B. Withrow, head of the Smithsonian's division of radiation and organisms, reported.

All life, it is explained, is tied intimately to certain solar wave bands. Photosynthesis, the process by which plants with energy from sunlight synthesize carbohydrates from water and carbon dioxide, has long been accepted as the cornerstone of all life on earth. But, the Smithsonian scientists pointed out, without some other process the carbohydrates might be a formless mass.

It is this second process that involves the red light and the "braking" system.

Teams of Smithsonian scientists have been engaged in studying this phenomenon which they think shapes a plant and controls development of stems, leaves and blossoms.

Now, as reported by Dr. Withrow, they think it might be a light effect, and that the process requires very little solar energy. Experiments have shown that the control is exercised by red light with a maximum of efficiency at wavelengths around 660 millimicrons, or millionths of millimeters.

It has been demonstrated, too, that this formative action can be blocked effectively by irradiation with wavelengths in the far red, and that the greatest effect is at wavelengths between 710 and 730 millimicrons.

The "brake" is not applied immediately, Dr. William Klein, another Smithsonian scientist, has found, but a little more than an hour after the plant is exposed to the formative wavelengths. The implication is that the action is an interference with the development process due to an action on some product formed by the shorter red wavelengths.

In other experiments, Drs. Withrow and C. C. Moh have found that chromosomes, or strings of genes, can be damaged by ionizing radiation. Drs. Withrow and Moh showed that damage to plants from X-rays can be increased from 30% to 50% by previous exposure to about the same wave band of far red light that reverses the formative process. On the other hand, they stated, the increase in damage is nullified if the X-ray exposure is followed by exposure to the red wave band.

Science News Letter, March 2, 1957

RADIO

Saturday, March 9, 1957, 1:45-2:00 p.m., EST.

"Adventures in Science" with Watson Davis, Director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Henry Dolger, chief of the Diabetes Clinic, Mount Sinai Hospital, New York City, will discuss "Diabetes Today."

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