ZOOLOGY

X-Rays Stop Tissues From Regenerating Themselves

Newts Receiving Radiation Fail to Grow New Tails; Delayed Dosage Makes Growth Slow and Abnormal

X-RAYS' growth-stopping effects have been critically studied on healthy animal tissues that would ordinarily regenerate themselves, by Dr. Pressley Lee Crummy, working under direction of Dr. H. H. Collins at the University of Pittsburgh. These studies throw light on two regions of biological interest: they furnish a basis for comparison between X-ray effects on normal and abnormal growing tissues such as cancer, and they add information on the curious phenomenon of regeneration, by which certain of the lower animals are able to replace lost body-parts such as tails and legs.

Dr. Crummy experimented on the spotted newt, a long-bodied, long-tailed relative of the more familiar frogs and toads. Amputating the tail-tips of some of these animals, he rayed the cut ends of part of them with appropriate dosages of X-rays at various time-intervals. The others he left unrayed, as "controls." After some weeks he examined the lot.

The "control" animals were found to be going through the normal regenerative procedure, growing themselves new tails as they would after an accident in nature. The rayed newts, on the other hand, were still stump-tailed as the amputation had left them; they had averaged only about a millimeter of new growth—about the thickness of an ordinary knifeblade.

A strange differential effect was observed. Dosages sufficient to inhibit regeneration completely when given immediately after operation, would not stop regeneration when administered some weeks after regeneration was under way. The delayed dosage, however, was found to slow up the growth rate of the limb and to cause abnormalities in the formation of the fingers.

In preliminary experiments, Dr. Crummy tried raying the very tips of some of the newts' tails. Without exception, a degeneration and sloughing off of the tissues took place, reminiscent of the loss of finger-joints suffered by early workers with X-rays, before their destructive powers were known.

In the experiments, of course, due consideration was taken for the feelings of the newts. The operations were performed under anesthesia, and their bodies, except for the parts to be X-rayed, were protected during treatment under a quarter-inch lead shield. Apparently it doesn't bother a newt to lose a piece of leg or tail—perhaps a compensation of Nature for having them bitten off by hungry fish or snapping-turtles. At any rate, they seemed to be quite contented without them, while they grew replacements, and incidentally furnished biologists with excellent material for fundamental studies of growth phenomena.

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ENGINEERING

Television For America Promised Within a Year

HIGH detail television within a year is promised by the Radio Corporation of America, probably in the metropolitan area of New York City, David Sarnoff, president of RCA, has announced.

RCA will invest $1,000,000 in the development of a transmitting station, the manufacture of receiving sets, and the formation of a program service which will take the air within twelve or fifteen months.

Declaring that American television is now prepared to give fine detail pictures better than those being used in Europe, Mr. Sarnoff emphasized that the greatest need of the art today is to take it out of the laboratory into the field for future development.

Already pictures with 343 lines to the inch, as compared with the crude 30 lines to the inch pictures of a few years ago, are now available. What one can now see with the present stage of television, Mr. Sarnoff said, is "comparable with what ones sees of a parade from the window of an office building, or a world series baseball game from a nearby roof, or of a championship prize fight from the outermost seats of a great arena."

Television, said the RCA president, will not compete with sound broadcasting in its nationwide scope. The first transmission will be over a circle not of more than 25 miles radius. Wire facilities are not available for wide distribution and such mass-broadcasting is "not here nor around the corner."

An enormous economic sacrifice will be necessary to "put over" television, Mr. Sarnoff indicated, for each advance in the art will make obsolete prior equipment, both transmitting and receiving. The situation will not be comparable to sound broadcasting, where a ten-year-old receiver may still be used if one is not too fussy about the quality. It will, therefore, not be well to have the systems of transmission or receiving standardized too soon on a wide scale if future progress is to be possible.

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BIOLOGY

Nature Levies Penalties For Destroying Her Mosaic

"NATURE'S Mosaic," the myriad-pieced jigsaw puzzle of living plants and animals that automatically fits itself together to cover all habitable spaces on the earth is self-maintaining, self-restoring when man is not too meddlesome. But let him presume too much, disturb the pattern too drastically, and Nature takes sharp toll of retribution.

That is one of the lessons of what has been happening in the West recently, Dr. George J. Peirce, emeritus professor of botany at Stanford University, pointed out in an address given under the auspices of Science Service.

Dr. Peirce said, in part: "If breaking the native sod, clearing the land, and sowing to grain be followed by prolonged and intense drought, the crops will fail, there will be no cover and no binder to the soil, the wind will pick it up, carry it away, and finally deposit it in those places where it is least desired. On the marginal lands of the Dakotas and of the western dry belt the would-be farmer smashed the Mosaic of Nature.

"He has suffered variously for years, producing crops of political, social and economic ideas repugnant to those less bold or less original persons who remained where water, soil and climate are less threatening. Finally the continued threat has been carried out, good soil has been lifted and whirled away, the former owner impoverished, the recipient embarrassed. A return of the soil to Nature is impossible. The Mosaic is not only broken, it is dissipated. (*Turn to page* 30)

"Erosion control is more than a charitable impulse, a vote-getting device, or a euphemism for a dole. It is a conscious, intelligent effort to repair, as rapidly as possible, what has been damaged by road cutting, by down-hill instead of horizontal plowing, by the destruction of the forest cover by fumes, and by other interferences with the established pattern of Nature. It checks the run-off after rain and melting snow; it prevents the scouring and scoring of hillsides; it reduces the risk of freshets; it lightens the load of silt carried by the streams.

"It is one of the finest examples of man's undoing by cooperation the harm which he has done individually in unintelligent self-interest. It is a partial fulfilment of the promise which the biologist sees of increased comfort, improved health, and greater happiness for all in such study and understanding as will lead man to be a harmonious and not a rebellious part of the Mosaic of Nature."

Dr. Peirce's address was put on the air over the network of the Columbia Broadcasting System.

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ARCHAEOLOY

One Door or Three, Never Two, Believed Mayan Rule

A PUBLIC building may have one door or three, but never two.

Archaeologists who recently counted doors in ruined cities in tropical America have wondered whether this could actually have been a strange building rule of Mayan architects, centuries ago. Now, through important new discoveries at ruins of Yaxchilan, famous Mayan city, the belief is confirmed.

Reporting the discoveries to the University Museum, Philadelphia, Linton Satterthwaite, Jr., leader of an expedition to the Mexican-Guatemalan border country, states that Yaxchilan had previously seemed to contradict the theory of uneven numbers of doors. Several partially cleared buildings had revealed only two doorways.

At the suggestion of Dr. Sylvanus G. Morley of the Carnegie Institution of Washington, who recently advanced the theory of the uneven doors, Mr. Satterthwaite directed further clearing of the Yaxchilan buildings, and in each instance found a third doorway.

"The great importance of these doorways," Mr. Satterthwaite stated, "lies in their sculptured and inscribed lintels, which bear on their surface bas-reliefs similar in subject and technique to the enormous monolithic stelas familiar in Mayan art, but far superior to the latter because of the delicacy of workmanship required for their small size.

"Of the inscriptions, only numbers and dates in the Mayan calendar can be deciphered with certainty but where these are present they almost invariably yield the exact date of the bas-relief and therefore presumably of the building as well. It is possible, therefore, to place all such dated examples in strict chronological sequence, to a degree possible in the study of no other ancient art.

"In addition to the lintels we also found and photographed a hitherto unnoticed altar lying overthrown in the jungle growth, as well as a large new fragment to add to a previously known stela.

"Among these discoveries are two sculptures which will take their place among the outstanding specimens of Mayan art so that in addition to their importance as historical documents they are of major interest for their artistic achievement and for the religious scenes they bear."

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MUSEUM SCIENCE

Urges Medical Ethics For Restorers of Paintings

BEAUTY doctors of the art world who perform dangerous operations on important and famous paintings, to prolong their life and restore their loveliness, may yet be required to obtain a license, just as a surgeon is required to do.

Comparing the "health" of a Titian painting to the health of a human being, E. W. Forbes, director of the Fogg Art Museum, Cambridge, Mass., speaking in Washington, stressed the need of adopting high standards for art restorers, patterned after medical ethics and professional requirements. Mr. Forbes addressed the American Association of Museums.

Art restorers, who treat such ailments of paintings as cracked paint, dirt, discolored varnish, and over-painting, have long inclined to the practice of cherishing their personal trade secrets and discoveries. This should be abandoned, Mr. Forbes urged.

"It is as unethical for a restorer to retain for his own private use any wonderful discovery which he makes," declared Mr. Forbes, "as it would be for a doctor to conceal from the world some great discovery which he might make to enable him to cure, let us say, cancer or tuberculosis."

Art restorers are now offered a way of handling this matter of sharing their discoveries. Mr. Forbes stated that a journal, similar to the journals of medical science, has been provided in which art restorers can publish their researches.

He expressed the hope that, with all serious students in the field combining forces, in ten years or more "we shall have a group of competent restorers who know more than any restorer does know now, or ever has known."

Licensing art restorers, as doctors of medicine are now required to be licensed, is foreseen by Mr. Forbes, who predicted a time when a commission of competent people may be named to judge which art restorers should be licensed to perform dangerous operations on great pictures.

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HOME ECONOMICS

Find Way to Feed "Cattle Food" to Humans

A WAY to feed grain sorghum to humans, and make them like it, has been devised by dietitians.

How ordinary recipes may be altered to use these "cattle feed" grains in biscuit, muffins and steamed breads has been reported to the American Home Economics Association.

The experiments, by Emma L. Bond and Helen B. Burton of the University of Oklahoma, are expected to be useful in sections of the country where grain sorghums are produced. Persons who cannot eat wheat because of sensitiveness to that form of protein may also find sorghum bread useful, the experimenters suggested. The grains used in the experiments were dwarf yellow milo and black hull kafir corn.

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In his studies of ability of adults to learn, Prof. E. L. Thorndike finds that "a man at 65 may expect to learn at least half as much per hour as he could at 25 and more than he could at the ages of eight to ten years."