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AN INDEX OF OLD AGE

By Dr. Edwin E. Slosson

Why does chick or child grow rapidly at first, then gradually slow down and finally stop growing altogether? How does it know when it has got its growth?

What checks the growth of a leg or a finger when it has reached the proper length? Sometimes of course it does not stop at the right time, and the unfortunate individual gets too tall to fit into a sleeping car berth, or carries through life unwieldy feet or an uncomely nose. But these exceptions only emphasize the rule.

Another mystery of like magnitude. When the individual has reached maturity and his cells have lost their youthful zeal for expansion and settled down to a quiet life, there may arise an emergency that will set them off again. A cut or burn for instance may destroy a considerable mass of bone or muscle. The neighboring cells, quiescent for years perhaps, start to growing and multiplying at as rapid a rate as when they were young, and within a couple of days have made perceptible progress toward closing the wound. Also why is it that certain peaceful and orderly cells, without any apparent provocation, are suddenly seized with an imperialistic mania and develop a cancer?

We are so accustomed to such occurrences that we think they seem too "natural" to need explanation, yet until recently no one had been able to suggest a reason for them. But a new method of experimentation has been devised by Dr. Alexis Carrel of the Rockefeller Institute for Medical Research that promises to throw light upon these old questions. He has found it possible to pick out a few cells from the blood or flesh and grow them in glass flasks, where they can be experimented upon at will. If kept at the normal temperature and duly fed with blood serum and embryonic tissue juice they will thrive and multiply as well as in the body; better in fact, for they do not die of old age, but live on indefinitely. He started the artificial cultivation of a minute bit of cartilage from the heart of an unhatched chicken over twelve years ago, and it is growinggyet, long after the fowl would have died if it had hatched.

Such cartilaginous tissue cannot live on scrum alone. Apparently its protein has to be prepared for it by certain growth-promoting agencios that he calls "trephones", that is feeders. They are produced by the white blood corpuscles and certain glandular secretion, and they decrease with age. But besides

this the serum contains some sort of substence that works the other way. It restrains or prevents the multiplication of cells and so inhibits growth. The amount of this inhibiting factor in the blood increases with advancing age, rapidly at first and than more slowly.

This discovery affords a way of measuring the age of an animal by observing the effect of its blood serum on the cells under cultivation in the flasks. When, for instance, the cells were supplied with serum from a hen six weeks old they lived 46 days. In serum from a three month old hen they lived 30 days. In serum from a three year old hen they lived 15 days, and in serum from a nine year old hen the cells survived only 4 to 6 days. If this test could be sufficiently simplified we might be able to ascertain with accuracy the age of a spring chicken, instead of having to take the dealer's word for it.

Exporiments with the blood of dogs gave the same results. The serum from a dog eight years old restrained the growth of the cells ten times as much as serum from a two weeks old pup.

Whether the method can be applied to human beings remains yet to be determined. If it can be we may be able some day to determine not only how old a person actually is, but why. And if the growth-promoting and the growth restraining factors can be identified and independently prepared it may be possible to regulate their balance and restore it when it is disturbed.

ROCKS AND HILLS OF DAYTON RESTIFY FOR EVOLUTION

By Watson Davis

The very hills themselves testify for evolution.

The little town of Dayton, to be the scene of the now famous trial of Prof. J. T. Scopes for violation of the Tennessee anti-evolution law, could not be better placed geologically as the site for such a test to determine whether natural law, made by God, or statute law, made by man, shall prevail.

The very ground the courthouse is placed upon, the rocks of the landscape with the embalmed life of ages ago will all be irrefutable witnesses for the defense if men will but use their eyes and their brains.

West of the little country town of Dayton is Walden's Ridge, named for an event in a previous struggle that concerned the freedom of the body of man. It is appropriate that this ridge is composed of the youngest and most recent rocks of the region thereabout and that below it, exposed by the the wear and wash and the uneasiness of the earth for milleniums, thereis layer upon layer of rocks each represent ing different and progressively older deposits. The ridge itself is composed of sandstone interleaved with layers of coal, the atural source of one of the commercial products of Dayton. This is the record of the rocks that testifies today that there was a time when trees looked like gigantic ferns and had spores instead of seeds. Look at a piece of coal under the microscope and those spores can be seen and identified today.

Close by the coal seams are layers of iron ore made by the accumulative activities of millions of bacteria millions of years ago. And lower down in the hills