

## EVOLUTION

# Seek Key to Evolution

► **MAN EVOLVED** from flatworm-like animals and not from jelly fish-like forms.

This theory of animal evolution, which differs markedly from that being taught at all levels of biology in the United States, is at the bottom of a study being carried on at the Bermuda Biological Station, St. George's, Bermuda, by Dr. Earl D. Hanson of Yale University, New Haven, Conn.

In a paper scheduled for publication in a scientific journal, Dr. Hanson sets forth his reasons for postulating a major change in our ideas of how man and the higher animals arose from one-celled creatures hundreds of millions of years ago.

This theory is not new. It was first suggested by the German scientist von Jhering in 1877, and gained some support, only to lose out again to the gastraea, or what we might call a jelly fish theory postulated by another German scientist, Haeckel. It is the Haeckelian theory of evolution that is currently predominant in the United States.

Recently, however, Prof. Jovan Hadzi of the University of Ljubljana, in Yugoslavia, has restated and expanded von Jhering's theory.

According to Haeckel and his followers, multicellular animals evolved from one-celled animals by colonization. More specifically, unicellular protozoa banded together and evolved colonial animals such as jelly fish, and some of these evolved

into flatworms and then on up the ladder to man.

Prof. Hadzi and Dr. Hanson, on the other hand, contend that during the forenoon of evolution one-celled animals became multicellular, not by banding together, but by individuals first becoming multi-nucleated and then evolving cell membranes around those nuclei. There is, as Dr. Hanson told *SCIENCE SERVICE*, strong evidence that one-celled animals evolved directly into flatworm-like creatures by this process. And the primitive flatworms, in turn, became the jelly fish's and man's progenitor.

Hence, the jelly fish, rather than playing the dominant role in evolution as Haeckel has assigned it, became only a dead-end experiment, an offshoot that went nowhere on the evolutionary stepladder.

Dr. Hanson is working with the primitive free-swimming flatworms known as the *Acoelous turbellaria*. He hopes to show that the flatworm has characteristics during its cell division that lie between those exhibited by one-celled animals and those of multicelled animals.

If Dr. Hanson finds what he is looking for, it will provide him with additional evidence to strengthen the theory that man evolved from an individual multinucleated cell and not from a colony of cells.

Dr. Hanson's work is being supported by a grant from the National Science Foundation.

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andre Ivanoff of the Museum National D'Histoire Naturelle, Paris, France, and Nils Jerlov of the Oceanografiska Institutet, Goteborg, Sweden, are trying to learn which fish or sea animal eyes are sensitive to polarized light; the distribution of polarized light and how it is affected by such things as turbidity; and the influence of these factors on undersea animal behavior.

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**SOLENOID**—The large solenoid used to provide a precisely known magnetic field about the proton sample is shown. Within the solenoid can be seen the coils that surround the sample and are used to measure the precession frequency.

## BIOLOGY

# Study Fish Navigation

► **SOME FISH**, like birds, migrate thousands of miles each year to lay their eggs and then return to the same ocean area they had migrated from. Even those fish that do not migrate seem to know exactly where they are going.

How these undersea creatures navigate as accurately as they do is one of the perplexing problems of science. If scientists can learn the secrets of fish navigation, it is conceivable that a similar system could be devised for man, the swimmer, and man, the submariner.

A biological and optical attack on this mystery is being made at the Bermuda Biological Station, St. George's, Bermuda, by an international team of scientists headed by Dr. Talbot H. Waterman of Yale University, New Haven, Conn.

Part of the attack is based upon what man knows about landlubbers. A wide variety of terrestrial animals and insects have been found to use the sun as a compass. Many also utilize the polarized light of the blue sky for their geographical direction signs. Most persons are capable of distinguishing polarized light only slightly with the naked eye. Human beings do not make

use of polarized light in nature, even though they may be able to tell direction from the sun, moon and stars. In large measure, man depends on man-made compasses responding to the earth's magnetic field.

The possibility exists, however, that fish and other sea animals resemble their landed kin and are similarly equipped with a polarized light compass that aids them in underwater navigation.

Potentially, Dr. Waterman explained, fish live in an environment that would seem to favor an underwater sea compass. Underwater light is from 60% to 70% polarized in very clear water such as is found in the Mediterranean or Sargasso seas. Nevertheless, it has yet to be demonstrated outside the laboratory that creatures of the deep have sun compasses or use the polarized light as navigational direction finders.

If and when a sun compass is found to be used by fish for navigation, Dr. Waterman pointed out, there will still be unexplained phenomena. What, for example, do fish use at night when there is no polarized light available or what do those in deep water do where sunlight never penetrates?

Currently, Dr. Waterman and Drs. Alex-

## PHYSICS

# Fundamental Constant Of Proton Redetermined

► **A FUNDAMENTAL** physical constant, the gyromagnetic ratio of the proton, has been redetermined very accurately by scientists at the National Bureau of Standards.

The new value for the proton magnetic moment means:

1. Important properties of the proton and electron, fundamental building blocks of matter, can now be known with greater precision. These properties are essential to a future understanding of atomic nuclei.

2. A convenient standard is available to industry for measuring magnetic fields in high-energy accelerators, servo mechanisms, electromagnets, etc., with greater precision than previously possible.

3. It is now possible to readjust the values of all other physical constants whose values depend on the measurement of magnetic fields, such as the electron charge-to-mass ratio,  $e/m$ , and Planck's constant,  $h$ .

The redetermination was made by P. L. Bender and R. L. Driscoll of the Bureau staff using facilities provided by the Fredericksburg Magnetic Observatory of the U. S. Coast and Geodetic Survey.

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