

### Unseen but Important

► ISN'T it odd, how all animal life in the sea is dependent on tiny plants invisible to the naked eye!

Vast mountains of these algal cells are accounted for in the more usual cycles of eat-and-be-eaten represented by practically all fish, crustaceans, dolphins, seals, whales, as well as less familiar creatures such as jellyfish, starfish and sea urchins, octopuses

and cuttlefish—all the larger carnivora and scavengers that swim the sea and crawl on its bottom.

Each of these creatures eats other animals a little smaller than itself. These in turn prey on still others that are a step smaller, until at last we get down to the ultimate feeders on the one-cell algae—animals that are microscopic themselves. There may be a dozen or a score of digestive steps between diatom and whale.

That pyramiding of hungers holds true specifically for the sperm whales, the only whales that eat really large bites. With their enormous jaws and stumpy teeth as big as pint jars, sperm whales rend and devour the pink flesh of the giant cuttlefish that live in the great dark depths. These cuttlefish are in turn devourers of anything they can touch with their anaconda-like arms, including many really large fish. The big fish in turn are eaters of smaller fish, and the smaller fish feed on still smaller ones. The smallest fish eat tiny shrimp-like creatures, marine worms, swimming mollusks, and so on. These, finally, make the ultimate food-demand

upon the one-celled algae, the humble grasses of the sea.

Whales, partly because of their huge size, partly because of the mystery that still surrounds much of their lives, give dramatic emphasis to the struggle for food, the compounded tragedy of eat-and-be-eaten that goes on incessantly in the sea. But it must be remembered that on smaller scale it is repeated in the life of every fish down to the smallest minnow, every squid and cuttlefish, every oyster and clam, every sea animal that eats other sea animals.

Hence the anxious preoccupation of sea scientists with the microscopic algae. With all the care and ingenuity that agronomists bestow on questions of soil fertility, rainfall, growing temperatures, and all other factors that make for success or failure in the production of land crops and pastures, the oceanographers study the conditions that influence the lives of these humble plants that are the foundation of whatever men take out of the sea with hooks, or nets, or harpoons.

(Reprint from SNL, Sept. 14, 1940)

### PHYSICS-MATHEMATICS

## Earth's Magnetic Field

► THE gravity pull of the earth as it spins on its axis may be what gives the earth its magnetic field and makes compasses point to the north.

This simple explanation for one of the baffling and important problems of modern science is given by Dr. Antonio Giau of Lisbon, Portugal, in the scientific journal, *PHYSICAL REVIEW*.

The new explanation of the earth's magnetism is based on Dr. Giau's "unified field theory." Scientists following this explanation do not need to assume that the core of the earth is a giant magnet or that the ionosphere and atmosphere have impossibly great circulating electric currents.

Beginning with a study of the natural geometry of our familiar three-dimensional space plus time, and by wrapping another fifth dimensional space around it, Dr. Giau finds that the gravitational effects explained by Einstein have a close parallel in the electrical effects of the new geometry and that the two are necessarily closely related.

Behind the complexities of Dr. Giau's mathematics is the fact that the familiar effects of gravity are due to the curvatures of our space-time as seen from within our universe. But electric and magnetic effects come from curvatures that can only be appreciated by a mathematician or by some five-dimensional being looking at us from outside of our universe.

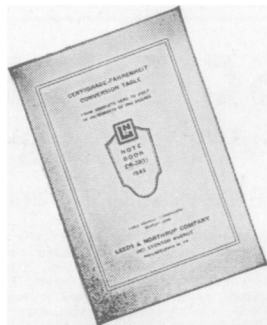
The magnetic fields of the earth, sun, stars and the neutron all receive a direct explanation by the new theory. In the case of the earth, assumed to be a rotating mass

containing no permanent magnets, the magnetic field that points compasses to the north appears as a natural consequence of the rotation. In addition, there appears at the same time an apparent electric charge on the earth.

In the case of some massive rotating stars, Dr. Giau surmises, this electric charge of the star might become great enough to make the star into a giant particle accelerator or "atom smasher" which can throw atomic fragments out into space with the great energies of cosmic rays.

Those stars with the peculiar variable magnetic fields recently observed are explained by the theory, as well as the more familiar Coulomb electrical forces well-known to physics students.

Science News Letter, October 1, 1949



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