

# SCIENCE

VOL. 73

FRIDAY, MAY 8, 1931

No. 1897

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SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKEEN CATTELL and published every Friday by

## THE SCIENCE PRESS

New York City: Grand Central Terminal

Lancaster, Pa.

Garrison, N. Y.

Annual Subscription, \$6.00

Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

## TECHNOLOGY AND MATERIAL PROGRESS<sup>1</sup>

By Dr. WILLIS R. WHITNEY

DIRECTOR OF RESEARCH LABORATORY, GENERAL ELECTRIC COMPANY, SCHENECTADY

THERE is nothing in fixity. It is a figment of the imagination. The fact is old, the discovery is modern. Progress and not product dominates mankind. This has always been a changing universe. Perhaps the cave-man noted no change, but nevertheless its continuity had already been long established. Nowhere in the widest stretches of astronomical time is there any sign of one changeless period. The starry firmament itself has only been known to us through its changes. We interpret rays from the stars as proof that the most stable things on earth, our very elements, are being reduced and produced. The atoms are wireless stations which broadcast information of changes quite beyond our earlier comprehension.

Continuous change marks not only celestial systems


<sup>1</sup> Presented at the general meeting of the American Philosophical Society, Philadelphia, April 23, in the symposium on "Tendencies in the Natural Sciences in the Changing World."

and our inorganic worlds, but every living thing, from polyp to politician. All have developed by change and are still changing.


The single living cell which first slipped the hawser that anchored it to some submarine rock hopefully wiggled its residual stump, or cilium, and, thus experimentally moving about, found it could better meet its food half way. Thus changes for good in life may be due to an unsatisfied, but not necessarily dissatisfied previous state. Being unsatisfied or inquisitive is not safety first, and in the Devonian age many an experimenting fish must have died at low tide before satisfactory lungs were developed.

Certainly the persistence of change, the absence of fixity which is so evident to-day, must have been seen by early philosophers, though I suspect that the possibilities in change, nay, the certainty that changing, or progress, is the all-important thing, had not been





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