

SCIENTIFIC AMERICAN


Established 1845

CONTENTS FOR JULY, 1955

VOL. 193, NO. 1

Copyright 1955 in the U. S. and Berne Convention countries by Scientific American, Inc. All rights reserved.

ARTICLES

- INDUSTRIAL PRODUCTIVITY** by Seymour Melman
In some countries the output per man-hour is conspicuously high, and within a given country such as the U. S. it can greatly increase over the years. It depends on mechanization—but what controls mechanization? 33
- FRACTURES IN THE PACIFIC FLOOR** by Henry W. Menard
Beyond the California coast and stretching toward Hawaii, vast parallel ridges wrinkle the earth's ancient hide. Discovered within the last decade, they have provided classic material for geological speculation. 36
- A FORGOTTEN NATION IN TURKEY** by Seton Lloyd
The glories of the ancient Hittites have long blinded us to the achievements of surrounding civilizations. The author, who has been excavating in Turkey, here introduces us to the Hittites' long-neglected neighbors. 42
- COAL** by Lawrence P. Lessing
Recent scientific and technological developments suggest that it is wasteful to burn this fossilized relic of ancient plants. Its subtle blend of hydrocarbons might better be utilized as a chemical raw material. 58
-  **AN INTERVIEW WITH EINSTEIN®** by I. Bernard Cohen
In his small frame house on Mercer Street in Princeton, Albert Einstein received many visitors in his later years. Among these was the recorder of this conversation, which occurred two weeks before Einstein died. 68
- THE MUTATION OF VIRUSES** by C. A. Knight and Dean Fraser
In 1918 and 1919 an influenza epidemic killed 25 million people. It was due to a change in the hereditary constitution of a virus. Such changes are studied as a clue to the mechanism of mutation in all living things. 74
- DISLOCATIONS IN METALS** by Frank B. Cuff, Jr., and L. McD. Schetky
The strength of metals, and other important aspects of their behavior, cannot be explained if they are considered to consist of perfect crystals. Dislocations are crystal faults that account for many of these properties. 80
- POLARIZED LIGHT AND NAVIGATION** by Talbot H. Waterman
All creatures that can see the sky live in a world of polarized light. Many land animals are known to use polarization to find their way about. There is considerable evidence that underwater dwellers may also do so. 88

DEPARTMENTS

LETTERS	2
50 AND 100 YEARS AGO	10
THE AUTHORS	18
SCIENCE AND THE CITIZEN	48
BOOKS	96
THE AMATEUR SCIENTIST	104
BIBLIOGRAPHY	112

Board of Editors: GERARD PIEL (*Publisher*), DENNIS FLANAGAN (*Editor*), LEON SVIRSKY (*Managing Editor*),
ROBERT EMMETT GINNA, JEAN LE CORBEILLER, JAMES R. NEWMAN, E. P. ROSENBAUM
Art Director: JAMES GRUNBAUM
General Manager: DONALD H. MILLER, JR.
Advertising Manager: MARTIN M. DAVIDSON

SCIENTIFIC AMERICAN



COAL

FIFTY CENTS

July 1955