

000,000,000) all arranged in perfect alignment and set into a single regular pattern. Here is regimentation to end all regimentation.

Object of the large single crystals, which are sometimes four inches long and three-sixteenths of an inch in diameter, is to study the forces which bind metals of alloys together.

*Science News Letter, July 8, 1939*

## PSYCHOLOGY

## First Steps to Language Discovered in Chimpanzees

**B**EGINNINGS of the ability that enables man to talk have been discovered in man's close relatives, the chimpanzees, by Drs. Robert M. Yerkes and Henry W. Nissen, of Yale University's Laboratories of Primate Biology, they revealed (*Science*, June 23).

All apes do not have the symbolic ability necessary for speech, the scientists indicate. And use of symbols as simple to man as "blackness" or "whiteness" is very difficult for any chimpanzee. This makes them think they may have stumbled on the very start of pre-linguistic ability in the evolutionary ladder.

A fundamental difference between man and the very man-like chimpanzee is revealed by one test of this ability to use symbols. Food is placed in one of two boxes and then the relative positions of the boxes are changed.

A man is able to find the food again with no difficulty. He may have said to himself as he watched it placed there, "It is in the black box" or "It is in the white box."

The ape, apparently lacking an understanding of "whiteness" or "blackness," finds the same problem extremely difficult if not entirely impossible. If, however, the ape has a cue to tell him on which side the box with the food has been placed, the problem becomes simple.

"It appears," the scientists conclude, "that whereas the 'thereness' of the cor-

rect box may readily be responded to by the chimpanzee, the 'thatness'—as exemplified by a symbolic process equivalent to rectangular whiteness—is used with difficulty and uncertainty."

Symbolic thinking may occasionally oc-

cur in the chimpanzee, these scientists conclude, but it is relatively rudimentary and ineffective. Older, more experienced chimpanzees are no better at it than are the young.

*Science News Letter, July 8, 1939*

## PHYSICS

## Best Ways to Make Raindrops Studied to Aid Ray Research

**A** WELL known weather phenomenon which may make rain threaten but never come is helping scientists trap cosmic rays in better fashion, it was reported to the American Physical Society meeting at Stanford University by Dr. Robert M. Langer of California Institute of Technology.

"There may be excess moisture in the atmosphere and rain may threaten for a long time before the droplets grow big enough to fall," explains Dr. Langer. "The condensation of water vapor from the air on to the drop happens rapidly enough at first but so much heat is given out in the process that the droplet warms up until the evaporation from it just about equals the condensation upon it.

"Unless this heat of condensation is dissipated the droplet will stop growing before it can be seen. The best way to dispose of the heat is to pass it into the surrounding air if this air remains cool enough."

This matter of "why it doesn't rain" is important not only to the weatherman but also to cosmic ray scientists who make the rays become visible by having them create paths of artificial raindrops in special instruments known as Wilson cloud chambers.

The idea, Dr. Langer adds, is to produce a fog along the track of the cosmic ray. If the fog particles form slowly the track is distorted meanwhile by air cur-

rents. A false impression of the track is obtained.

Working with Dr. Carl Anderson, Nobel Prize winner of California Institute of Technology, and with Dr. Seth Neddermeyer and Dr. J. K. Boggild, exchange fellow from Denmark, Dr. Langer has found that it takes a full second for fog drops in a cloud chamber to attain full growth. Nothing, apparently, can decrease this time without spoiling some other feature of the experimental arrangement.

As a result, he reports, extreme precautions must be taken to prevent air currents before good cosmic ray tracks are to be expected.

*Science News Letter, July 8, 1939*

## METALLURGY

## Metallurgical "Surgeons" Operate on Steel Mill

See Front Cover

**N**OT a group of witches stirring their mysterious cauldron, but a group of arc welders doing a major operation are shown on the front cover of this week's SCIENCE NEWS LETTER. Such operations are now as common in the industrial world as appendectomies are to the average person. This particular operation was to quickly restore a steel mill to service by repairing the pusher head of a scale breaker which is used to remove slag from slabs coming from the reheating furnace.

To repair the break which stopped an entire mill, 400 pounds of steel, in the form of arc welding electrodes supplied by The Lincoln Electric Company, Cleveland, Ohio, were melted into the casting. Without electric arc welding, the mill would have been shut down for several weeks awaiting a new casting. Six arc welders had the mill back in operation in eight hours.

*Science News Letter, July 8, 1939*

The papyrus plant, once so useful to Egypt, no longer grows there.

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