

## METALLURGY

**Highly Purified Iron Made from Liquid**

**H**IGHLY purified iron, possessing many of the qualities of copper, is prepared in Germany by a new process described recently by Dr. Ing. L. Schlecht.

Carbon monoxide of a high degree of purity is passed over hot iron, previously purified by ordinary methods. The two unite to form a liquid of relatively low boiling point, iron carbonyl. Heating this drives off the carbon and oxygen, leaving iron with hardly a trace of impurities, in an exceedingly finely powdered form. The individual spherical particles are only 20 millionths of an inch in diameter.

Heating this powder to a temperature of 1200 degrees Centigrade—twelve times as hot as boiling water—changes it into solid iron that resembles copper in its softness, resistance to corrosion and other properties. The process is declared to be applicable on a large scale, and the product to be much more useful than ordinary iron for many purposes.

*Science News Letter, August 1, 1931*

## PSYCHOLOGY

**Background of Black With White Letters Undesirable**

**P**SYCHOLOGISTS advise against the use of white letters on a black background for lengthy advertising messages as a result of the determining at the University of Minnesota that it takes the reader about 10 per cent. longer to read material printed in this manner than it does to read similar material printed in the usual manner.

"The advertiser who contemplates utilizing white on black must decide whether or not the greater attention value of white on black through novelty will be sufficient to offset the disadvantage of a 10.5 per cent. difference in speed of reading," Drs. Donald G. Paterson and Miles A. Tinker say in the report of their investigation which will be published in a current issue of the *Journal of Applied Psychology*.

"Perhaps the best compromise would be to adopt the rule that whenever white on black is employed as a device for attracting attention, the amount of reading material should be reduced to a minimum so that the question of

speed of reading the advertising text ceases to be a problem of any moment."

Another study conducted under the direction of Dr. Tinker by Grace Holmes disclosed the fact that black type can be read at a distance nearly fifteen per cent. greater than that at which white print is legible. Those taking part in the experiment reported that words in the white print appeared at a distance as a blur of white light with little or no definite form to the letters.

The psychologists believe that the superiority of the black type may be explained on the basis of the fact that we associate dark spaces with objects and light areas with intervening space. This would cause a person to pay attention to the black background rather than to the white letters which would appear merely as holes. Habit enters into the matter, too, for practically all reading requires the observation of black letters.

*Science News Letter, August 1, 1931*

## PHYSIOLOGY

**Lifelong Vegetarians Produce Less Bodily Heat**

**L**IFELONG vegetarians have a lower minimum production of heat and expend less energy on vital bodily processes than normal persons, it appears from investigations which Prof. Glen Wakeham and Louis A. Hansen of the University of Colorado have reported to the magazine, *Science*.

The Colorado scientists determined the basal metabolic rate of nurses in training at a vegetarian sanitarium. This rate is the measure of the least heat produced by a person twelve hours or longer after his last meal and when he has been resting quietly in bed. It usually is taken early in the morning before breakfast.

Five of the pupil nurses were lifelong vegetarians, having never eaten meat of any kind in their lives. Ten girls had not eaten meat for five years or more. The girls who had never eaten meat had a slightly lower rate than the ten who had only been vegetarians for five years, but both groups had considerably lower rates than a group of non-vegetarian girls who were examined. However, the average rate of the non-meat eaters was not below what is generally considered the normal lower limit.

A long period of vegetarianism is necessary if the rate is to be noticeably reduced, the investigators reported.

*Science News Letter, August 1, 1931*



## ORNITHOLOGY

**Carrier Pigeon Has No Special Sense of Direction**

**H**OW does the pigeon find his way home? Many of the theories heretofore advanced involve the idea of a special sense of direction, but experiments conducted by Dr. Ralph H. Gundlach, of the University of Washington indicate that the correct explanation is probably that these birds have good vision, wide cruising range, and some special motivation.

Dr. Gundlach constructed a maze in such a way that only a creature having a directional sense would be able to solve it. The experienced homers tested showed no sign of reaching a solution even after three months of trial. Another test was to release 16 trained racing homers on a course lying in a direction from home different from that of the course on which they were trained. These racers were accustomed to covering 100 miles in two hours on their home course. On the new one in which they had to find their way only three came home in less than five hours. Six were out from one to 14 nights, and two never came home.

*Science News Letter, August 1, 1931*

## PUBLIC HEALTH

**Not Enough Nurses For Contagious Diseases**

**A** SHORTAGE of nurses competent and willing to care for patients suffering from communicable diseases like measles and scarlet fever is reported by the New York state department of health.

Only four out of every ten nurses in a group of more than 15,000 had had practical experience in caring for such patients, the committee on the grading of nursing schools found. Two out of every three schools do not even have a communicable disease service and do not affiliate with others to give their student nurses this type of training.

In one year New York graduated 1,453 nurses lacking this experience.

*Science News Letter, August 1, 1931*

# CE FIELDS

## ARCHAEOLOGY

### Unearthed Burials May Reveal Traits of Indians

**W**ORD of important discoveries has just been received by the Bureau of American Ethnology from the largest archaeological excavation which the Bureau has ever attempted. The expedition, led by Dr. Frank H. H. Roberts, Jr., is working at an undisturbed prehistoric Indian site near Al-lentown, Arizona, and has just unearthed four burials and numerous pieces of pottery, weapons, and ornaments.

The objects so far uncovered give promise that, as the excavation progresses, hitherto unknown traits of Pueblo life 1,500 years ago will be revealed. The pottery and other relics provide some new angles for study of Pueblo culture.

*Science News Letter, August 1, 1931*

## METEOROLOGY

### Wanted—Reports of Ball Lightning Observations

**B**ALL LIGHTNING, one of the rarest, strangest and least understood of natural electrical phenomena, has recently been the subject of an unprecedented amount of discussion in scientific circles. In the hope of getting new light on this mysterious phenomenon, Dr. W. J. Humphreys, meteorological physicist of the U. S. Weather Bureau, wants reports from everybody who has ever observed it. He has given a list of questions on the subject to Science Service, with the request that observers of ball lightning send their answers to him, at the U. S. Weather Bureau, Washington, D. C.

Ball lightning is quite unlike the almost instantaneous electrical discharge that constitutes ordinary lightning. It is a slow, long-continuing discharge, that floats through the air or runs along the ground in the shape of a ball, or sometimes the shape of a pear. The color varies from red through blue to dazzling white.

These glowing balls often enter

houses, coming down the chimney or entering through a window or door or even a crack. They float or glide around, sometimes with a fluttering or crackling noise, but seldom do any harm. There are no cases on record of persons injured by them; though Dr. Humphreys reports an amusing story that came to him of a too-curious pig that nosed one with his snout and was stunned when the ball literally "blew up in his face."

Dr. Humphreys' list of questions follows:

Who saw it? Names and addresses of all witnesses should be given.

Where and when was it seen? Location, date and time of day should be as exact as possible.

Did it come at the beginning, middle or end of the storm?

Did it occur indoors or out?

If indoors, how did it get in and how did it leave?

Was there one ball, or were there more than one?

How long did it last?

What were its size, shape and color?

Was its outline sharp or fuzzy?

Did it make any noise?

Did it leave an odor?

Did it move or stand still?

If moving, did it go with the wind or against it?

Was its movement vertical, horizontal or at an angle?

How fast did it move?

Was its movement smooth or in jerks?

What were its effects?

Dr. Humphreys is especially hopeful that some one may succeed in getting a photograph of a ball lightning discharge.

*Science News Letter, August 1, 1931*

## ETHNOLOGY

### Burials Bring Knowledge of Little-Known Ozark Life

**D**IGGING in a cave at Cedar Grove, Arkansas, an expedition from the Bureau of American Ethnology has discovered the burials of twelve individuals and hundreds of the tools, weapons, and beads that belonged to them.

First word of these results of the cave exploration has been received at the Bureau's headquarters. Judging from the list of discoveries, the U. S. National Museum will now have a collection of Ozark Indian relics equal to, or even greater than, any other collection in existence.

*Science News Letter, August 1, 1931*

## PSYCHOLOGY

### Emigrants Examined For Psychological Reaction

**D**OCTORS examining emigrants from England to Canada are instructed to pay special attention to psychological factors, according to the *Lancet*, British medical publication. The medical examination is required of all classes of emigrants desiring to live permanently in Canada. It is hoped that the examination will detect not only the obvious physical or mental defects in prospective emigrants, but also those persons who have defective judgment, unstable nervous systems, or who are emotionally oversensitive.

Release from restraining influences of the home environment is often too much for persons lacking in self-control or moral responsibility, the *Lancet* points out. The psychological stress of a complete change of environment is considerable. Comparative isolation in outlying districts; changes in money standard, food, cooking and dwellings; complete change in local interests and details of social life and activities; difference in customs and routine methods of doing business and work generally all tend to produce homesickness of such severity as to be really disabling.

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## CHEMISTRY

### Electrons Take Air Ride In New Electric Separation

**E**LECTROLYSIS, or electric separation of the elements in a chemical solution, is carried on in a new way by a process invented by Prof. Alfons Klemenc of the University of Vienna. The method promises results of great importance in research, and possibly also in industry.

In ordinary electrical separations, both positive and negative electrodes are immersed in the solution to be treated, and each takes out the atoms or atom-groups that are attracted to it. In Prof. Klemenc's process, the negative electrode is suspended above the surface of the liquid, and separated from it by an air space. When the current is turned on, a stream of electrons is given off by the electrode into the air.

The electrical phenomena that accompany this kind of electrolysis are quite different from those of ordinary electrolysis, Prof. Klemenc states.

*Science News Letter, August 1, 1931*