

struments before "the Day," which is June 19 next.

Dr. Paul A. McNally, director of Georgetown University Observatory and leader of the expedition, outlined to Science Service some of the preparations which have been made.

### Get Away From Big Plates

The highly enlargeable photographs represent an effort to get away from the ponderous temporary "astronomic artillery" which it has always been necessary to set up for solar photographs during an eclipse. They have been necessary because of the graininess of rapid photographic emulsions hitherto in use, which necessitated big plates taken through long focal lenses, if astronomers were to get any kind of detail to study.

Dr. McNally, using relatively short focal length cameras and fine-grained photographic emulsions, secured at the 1932 eclipse (Georgetown University total solar eclipse expedition) pictures that rank among the finest ever obtained of any eclipse. These pictures have been successfully enlarged as much as 100 times. Now, thanks to the cooperation of Dr. C. E. K. Mees of the Eastman laboratories at Rochester, N. Y., a still finer emulsion has been applied to glass plates for the first time. Dr. McNally hopes to obtain photographs that will enlarge up to 600 times. Such highly enlargeable photographs will permit the use of smaller, more easily carried and managed instruments, since the originals do not need to be so large.

### To Photograph Spectrum

An important part of the expedition's work will be the photographing of the sun's spectrum, or broken-up rainbow-band of light, during the eclipse. Thanks to the development of five new emulsions especially sensitive in the infra-red, photographs of this hitherto unstudied part of the spectrum will be obtained. The expedition will carry glass plates of a unique type, each one bearing all five of these emulsions in adjoining strips or zones, laid down "on the bias" to provide overlaps. The first of the emulsions is sensitive to infra-red rays up near the lower limit of the visible red, and thence they range in sensitivity down to an emulsion especially adapted to the deep infra-red rays of 12,000 Angstrom units wavelength.

When the first of these infra-red sensitive emulsions was brought out, some years ago, the plates could not stand being warmed at all, and had to be kept in a refrigerator. Since then, this instability has been largely overcome.

Another set of five special emulsions, each especially adapted for one group of wavelengths in the visible spectrum, will be used on five by seven inch plates, in the equatorial-mount camera. These will give photometric measurements of the light intensity in their respective parts of the spectrum. These measurements can be used directly in technical astrophysical studies, and they can also be used as the basis for a composite color-picture of the eclipsed sun, in hues of a scientific accuracy hitherto unattempted.

Direct color photographs will also be made during the eclipse, using negatives of the Du Fay process, and in addition a small motion picture camera, attached to the equatorial mounting, will make Kodachrome movies of the eclipse.

The expedition sailed on April 10.

They will set up their apparatus somewhere near the town of Kustanai—about 500 miles east of Orenburg, because past weather records indicate that this region offers better-than-average chances of good weather at the time of the eclipse.

It is expected that the National Broadcasting Company will set up a station at the Georgetown University-National Geographic site to furnish details for their American listeners at the time of the eclipse. While the eclipse takes place at Kustanai at 8:40 a. m., local time, on June 19, the broadcast would reach hearers in the United States on the previous day, June 18, at about 10:30 p. m., E.S.T. Dr. McNally has been requested to speak to the American audience immediately after the eclipse.

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#### PSYCHIATRY

## Unmarried Persons More Prone to Mental Disease

**B**ACHELORS are three times as likely to go insane as are married men. Divorced men are even more likely to develop mental disease, Drs. James Page and Carney Landis of New York Psychiatric Institute revealed in a report to the meeting of the New York Branch, American Psychological Association.

Marriage is not a "vaccine against mental disease," they warned. But it acts as a sieve; men who are later to need treatment for mental disease are not the ones who readily find wives and willingly enter into marriage. If they do get married, they are more likely to be weeded out by divorce.

Here are the striking figures presented to the meeting by Dr. Page: For every one married man admitted to mental hospitals during the period studied, two widowers were admitted, three single men, and about 4.5 divorced men.

For women, the figures are much the same. One married woman to two single women, three divorced women and about 1.4 widowed.

Young people under 25 years old were not considered in these figures.

When the proportion of married and unmarried mental patients was compared with the marital status of the general population, it was found that a somewhat greater percentage of single persons and a markedly greater percentage of divorced persons find

their way into mental hospitals than remain in the population at large. To be sure, it was pointed out, the married people do not always need to go to mental hospitals; they are taken care of at home.

Only among women admitted for alcoholism or general paresis were the numbers of single persons smaller. That is due to the high moral standards of American spinsters, Dr. Page said.

"The eugenic implication of this study is that from a heredity viewpoint mental diseases are self-limiting," Drs. Page and Landis concluded. "Since comparatively few mental patients marry, the spread of psychopathic tainting is restricted. In other words the biological principal of the survival of the fittest is present in the field of psychopathology."

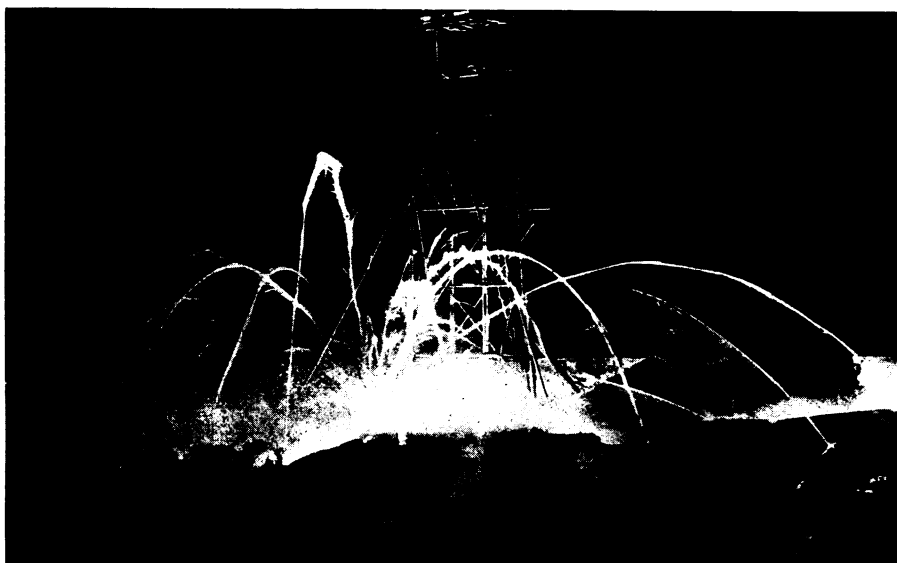
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#### PHYSIOLOGY

## Mongolian Idiots Have Special Finger Markings

**T**HE LINES and crosses on the palms of the hands and the finger-tip whorls are characteristically different in mongolian idiots, Prof. Harold Cummins of Tulane University told members of the American Association of Anatomists at Durham, N. C.

Prof. Cummins has previously found



### BOMB OF FIRE

One of the most effective of all incendiary devices used during the World War was the "Baby Incendiary" bomb used by the British. Here is a U. S. Chemical Warfare Service picture showing such a bomb exploding at night with a shower of flaming particles.

that the patterns of the lines of palms of hands and feet differ in the different races of mankind. Each race has its characteristic pattern, he found from studying thousands of palm prints.

Mongolian idiots are not necessarily Mongolians, but have the slanting eyes and other facial characteristics of the Mongolian race. The mental defect is present at birth. Finding of unusual characteristics in the palm patterns of

mongolian idiots indicates that the other physical characteristics are present at least as early as the third or fourth month of prenatal existence, since that is the stage at which the configurations on the palms appear.

The palm print characteristics cannot, Prof. Cummins said, be used as a diagnostic sign in an individual, but are characteristic of the group as a whole.

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#### PSYCHOLOGY-PHYSIOLOGY

## Brain Waves Provide New Clue to Mongolian Idiocy

**N**EW LIGHT on the brain condition underlying the peculiar mental defect known as mongolian idiocy may be obtained by tapping the electric waves originating in the afflicted person's brain itself, Dr. George Kreezer, of the Vineland Training School, indicated before the meeting of the New York Branch of the American Psychological Association.

Scientists do not know what causes this sort of mental deficiency. Several theories have been advanced, but none of them is entirely satisfactory. It is not thought to be hereditary, because it seldom occurs repeatedly in any one family. The name mongolism was applied to the condition, because of the characteristic physical appearance of individ-

uals with this type of mental deficiency.

Now, the newly developed technique of tapping the brain waves which accompany mental processes throws open a new door for the exploration of brains suffering from this little understood disease, Dr. Kreezer said.

He showed photographs of electric impulses tapped as they came from the brains of idiots with minds no more capable than those of ordinary 6- or 7-year-old children. He also showed, for comparison, brain waves taken from normal individuals.

Great variability exists between the brain wave patterns of different individuals, and idiots vary in this respect just as normal persons do. For this reason, Dr. Kreezer is proceeding with scien-

tific caution in the interpretation of his records.

But the records seem to indicate that, over and above the individual differences, variations in pattern and in frequency exist not only between normal persons and defective individuals, but also between mongolian idiots of relatively high levels of intelligence and those who have minds less capable than little four-year-old children.

Further study of this clue, Dr. Kreezer hopes, will provide new insight into mental deficiency of this type.

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#### CHEMISTRY

## Fogs of Fire Among the Horrors in Next War

**F**OGS of fire sprayed from low flying airplanes may be among the new horrors which the next war will bring to civilian populations far behind the actual combat lines, suggests Lieut.-Col. A. M. Prentiss of the Chemical Warfare Service.

Fire, spread by incendiary bombs, shells and flame-throwers, is not dead as a war measure, says the Chemical Warfare expert, despite the relatively ineffectual success of incendiary techniques in the World War. The rise of aviation since the war is the reason.

While the actual battle forces have become so mechanized that there is little about them to burn but their clothing, the civilians behind the lines will feel the brunt of the warfare by fire.

The fog of fire, explains Col. Prentiss, would be spontaneously inflammable fluid. "Not only should bombs of such fluid prove effective against specific targets, but by regulating the ignition to occur after the lapse of sufficient time for the liquid to reach the target, such a liquid could be sprayed at night from low-flying attack plane over relatively large areas with tremendous effectiveness," Col. Prentiss declares.

Writing in *The Military Engineer* (March-April) publication of the Society of American Military Engineers, Col. Prentiss traces the history of fire-making devices in warfare from the first "flame-thrower" used at Delium in 424 B.C., through the famous "Greek fire" of 660 A.D., down to the World War.

The apparent lack of success in the last conflict, he points out, was due in part to the fact that many of the chemicals were only in experimental production and never received a fair trial in the conflict.

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