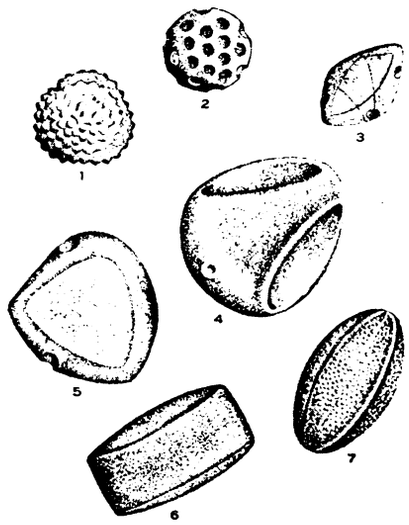

HOW IT LOOKS

These are pollen granules, very highly magnified. 1. Common Ragweed. 2. Russian thistle. 3. Hemp. 4. Corn. 5. Hickory. 6. Oak. 7. Sagebrush. (From Durham's "Your Hay Fever")

The bigger the grain the more rapidly it will fall through the air. So we find the smallest pollens are the most abundant in the air: ragweed, practically all the grasses, most of the hardwood trees.

The wind-borne pollens of pines and other similar evergreens are an exception to this rule. They, however, achieve buoyancy through another mechanism. Their moderately large grains are each equipped with a pair of hollow air sacs, that look very much like waterwings, and perform in the air very much as waterwings do for timid swimming pupils in the water.

Wind-pollination, for all it seems a hit-or-miss (usually miss) method, must not be for that reason only thought of as a mark of primitiveness in plants, or a sign of low place on the evolutionary scale. True, hardwood trees are usually assigned a spot near the bottom of evolutionary lineups among plants, and orchids, which are as far removed as possible from wind-pollination, are set at the top of their particular division of the plant kingdom. But grasses are also rather advanced plants, evolutionally speaking; and the most prolific of all wind-pollinators, the pesky but successful ragweeds, are composites, and thus among the very aristocracy of plants. They are, indeed, unacknowledged but close cousins of the sunflower—which at least one of our great political parties will tell you without hesitation is the noblest of all vegetables.

Science News Letter, August 15, 1936

ASTRONOMY

Radio Data From Eclipse Seem Unlikely To Be of Much Value

HOPES that radio observations of the recent eclipse of the sun on June 19 in Siberia would be highly valuable were dimmed when scientists at the National Bureau of Standards revealed results of experiments made in Washington during the eclipse period. Although few people realized it, a great magnetic storm struck the world just before and during the eclipse.

Despite general cloudiness and other unfavorable weather conditions, which ruined the visual and photographic observations of many eclipse expeditions from the United States and other nations, it was generally felt that the radio observations would be successful.

There was world-wide cooperation on the radio tests on the recent eclipse. While scientists on the eclipse path were taking their observations of the reflections of radio signals from the ionizing layers miles above the earth's surface, scientists S. S. Kirby, T. R. Gilliland, N. Smith and S. E. Reymer in Washington took similar measurements which were to establish the normal pattern of the world's radio "roof" half way round the world. Thus, it was hoped, the effect on the layers of the moon's shadow due to the eclipse could better be ascertained.

What decreases the hopes that the eclipse radio observations will be of value is the discovery that on the two days preceding the eclipse, the eclipse day itself and the following day, the ionizing layers indicated a severe magnetic storm which made the whole world picture a greatly abnormal one.

Even if the actual observations in the eclipse zone are different from the usual pattern it will be difficult to estimate just how much of the abnormality was due to the solar eclipse and how much was due to the known magnetic storm.

The National Bureau of Standards observations, just reported (*Physical Review,* Aug. 1), mark a new step in what should become standard practice in future eclipse studies with radio.

While the effect of the sun's eclipse on the reflecting layers has been observed before in the actual eclipse zone, there has previously been no attempt to learn what were the normal world-wide conditions and to use this knowledge as a check against the eclipse readings.

Science News Letter, August 15, 1936

PSYCHOLOGY

Fatigue on the Road Increases Accident Risks

TO THE experienced automobile tourist, rolling along a smooth highway for something like seven hours in a day is a simple matter. If he has stopped for a generous lunch and another time or two to stretch his legs and pick up a snack to eat or drink, he probably does not even feel tired.

Psychologists tell us, however, that this man is not mentally as efficient as he was at the start of his drive in the morning. Eye and hand do not work together with the same accuracy that they did. Vision is not so keen. It takes him longer to think. In short, temporarily he is what insurance men would call a "poor accident risk."

Details of psychological tests given to drivers at the beginning and the end of a day on the road are made public in a report by Drs. A. H. Ryan and Mary Warner, of Chicago, Ill., to the *American Journal of Psychology.*

Driving requires, among other things, fine discriminations through the eyesight and the muscular sense, sustained attention and complex movements, the scientists explain. Tests which would measure exactly these same abilities in the laboratory were chosen as a means of checking up on the efficiency of the drivers taking part in the experiment. Ability to keep the attention on a task was scored by means of a test of mental addition and another which required the calling off of the names of some 1,200 different colors. Other tests included measures of eyesight, steadiness on the feet, reaction of the skin to pressure from a blunt instrument (an index to action of the blood vessels) and coordination of the eye with the hand.

A decidedly lowered efficiency on the part of the driver was revealed by these tests given after the long drive when the results were compared with per-

formance on the same tests in the morning. The driver is slower, and seconds count when you are in command of a vehicle traveling along the highway at a speed of possibly 90 feet in every single second. He also makes errors in simple responses like those he is called upon to make in driving. If a driver makes the mistake of reaching for the gear shift lever instead of the emergency brake and then must reach again, and if, in addition, both movements have been slower than his normal reaching speed, think how far his car might have traveled toward disaster in the meantime.

That the deterioration of coordination and the other abilities used in driving was not just a reflection of the time of day but was truly the result of the long hours of driving was demonstrated by tests made on the same men on days spent in recreation or rest instead of driving.

"The effect of a long automobile drive may render a driver temporarily prone to accidents." This is the conclusion of the investigators.

Science News Letter, August 15, 1936

PHYSICS

"Perfect" White Exists Only As an Unattainable Ideal

"White" Is Always Gray, Sometimes Yellow, and May Be Almost Any Color; Science Is Setting Standards

PERFECT white, scientists declared, exists only as an unattainable scientific standard. All substances filling the layman's conception of whiteness are actually darker, grayer than the perfect white.

The nearest colors to the perfect white are those of the purest chalk or a very thick layer of new-fallen snow. But even these fall short of science's rigid standard.

This ordinary conception of whiteness has received scientific recognition only within the past three years. Previously scientists recognized only the perfect white. The increasingly wide use of the word white in connection with commercial articles, however, especially in advertising, made scientific recognition imperative.

Research to determine a method of grading these varying shades of white was undertaken in the Massachusetts Institute of Technology color laboratory. The results, which constitute the basis of all modern discussions of whiteness, were explained to the color conference meeting at the Institute by Dr. David L. Mac Adam, of M.I.T., who conducted much of the research.

All substances which are ordinarily called white, he told the conference, differ from the perfect white in one of two ways. All are darker, grayer than the perfect white. Some may show no other difference, and these are scientifically regarded as grays of differing degrees of brightness. They are commonly called whites, however, the brighter substances being regarded as whiter than the others. Using instruments, he explained, it was possible to measure relative grayness and identify this scale with the scale of whiteness as understood commercially.

Most substances, however, he continued, are not only grayer than the perfect white but are also actually colored to a slight degree. Most frequently this color is yellow, although it can be practically any color. Often, he pointed out, an attempt is made to reduce this coloration by addition of another counteracting coloring, a process known as whitening. To eliminate yellow, for example, a blue dye is added. Occasionally too much of this bluing is used, which accounts for the fact that blue, next to yellow, is the most frequent coloring of supposedly white materials.

Most difficult part of discovering the scientific meaning of whiteness, Dr. Mac Adam reported, was determining just how these discolorations influenced the popular estimate of whiteness as compared with the measured grayness.

It was solved by scientifically measuring the grayness and coloration of a large group of samples and then having individuals arrange them in the order of their apparent whiteness. The graders agreed fairly well and an average order was taken and compared with the measured discoloration and grayness of the samples. From this a method was evolved by which the whiteness of any sample can be predicted simply by measuring this grayness and amount of discoloration.

The discovery, Dr. Mac Adam said, makes possible the accurate and truthful commercial use of the terms white and whiteness and should eliminate ambiguous and misleading advertising claims, possible heretofore because whiteness had not been scientifically studied.

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