

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

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.

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 com-

monly 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.

● RADIO

August 18, 2:15 p.m., E.S.T.

MEASURING TIME—Paul Sollenberger
of the United States Naval Observatory.

August 25, 2:15 p.m., E.S.T.

CHILDREN WITH NERVES—Dr. Knight
Dunlap of the University of California.

In the Science Service series of radio programs over the Columbia Broadcasting System.

This Handy Coupon

IS FOR NEW OR RENEWAL SUBSCRIPTIONS

To Science News Letter, 2101 Constitution Avenue, Washington, D. C.

Please start renew my subscription to SCIENCE NEWS LETTER for 2 years, \$7 1 year, \$5

Name

Street Address

City and State

Extra postage charges: 50c a year in Canada; 75c a year in foreign countries.