

Williams, of the Ohio Agricultural Experiment Station, will be given at the joint dinner with the American Society of Agronomy on the evening of December 28 at the headquarters hotel.

The American Society for Horticultural Science will hold its meetings on December 28, 29 and 30. There will be sessions devoted to genetics and fruit breeding, small fruits, grapes, propagation of plants, tree fruits, growth and nutrition, vegetable crops, floriculture, ornamentals and economics. There will be a joint session with the American Society of Plant Physiologists on Thursday forenoon. The retiring president, Dr. H. A. Jones, of the University of California, will give an address at the annual banquet to be held Thursday evening. On Friday there will be a joint session with the section on agriculture, which will be addressed by Dr. C. G. Williams, director of the Ohio Experiment Station.

REGISTRATION AND RAILWAY RATES

GENERAL registration for the Atlantic City meeting of the American Association for the Advancement of Science and Associated Societies will be held in the ballroom of the Municipal Auditorium, which is centrally located on the boardwalk. This office will be open from Tuesday morning, December 27 at 9:00 o'clock to 12:00 o'clock Saturday noon, December 31. The registration fee for the Atlantic City meeting is \$1.00. Every one interested in the advancement of science who expects to attend any of the meetings is urged to register.

General programs will be available at the registra-

tion offices from Tuesday morning to Saturday noon. Each registrant will be supplied with a free copy of the general program which will be a book of 300-400 pages. Non-registrants may purchase programs for \$1.00 each.

Reduced railway rates by the standard certificate plan have been granted by almost all railroads in the United States and Canada. Persons attending the meeting should purchase a first-class, full-fare, one-way through ticket to Atlantic City, securing a certificate on the "Standard Certificate Form" reading "for the Atlantic City meeting of the American Association for the Advancement of Science and Associated Societies." Persons should leave their railway certificates at the validation desk to be called for later at the same place. Each person presenting an endorsed and validated certificate may purchase a continuous passage, one-way, return ticket for one half of the regular fare, by the same route as that followed on the trip to Atlantic City. The earliest dates at which tickets may be purchased range from December 20 for the most distant territory to December 23 for the nearest places. Certificates may be validated from December 27 to December 30. The last date on which return tickets may be purchased is January 4, 1933. There is a possibility that some of the railroads will offer excursion rates lower than the rates on the certificate plan. Members are urged, therefore, to consult their passenger agents before purchasing tickets.

CHARLES F. ROOS,
Permanent Secretary

THE NATIONAL ACADEMY OF SCIENCES

PAPERS PRESENTED AT THE ANN ARBOR MEETING. III

(Continued from page 547)

Diurnal variation in efficiency: NATHANIEL KLEITMAN (introduced by A. J. Carlson). Our diurnal sleep habit manifests itself in a certain degree of drowsiness which overtakes us every evening and gradually reaches an intensity that makes resistance to the onset of sleep well-nigh futile. Is this inclination toward sleep at the end of a day's activities dependent upon or independent of other periodic changes showing a 24-hour cycle? To answer this question a number of adult subjects were subjected to several simple tests at different times of the day, and variations in performance noted as regards the length of time required to carry out a certain task, or the number of errors made in a definite period of time, or both. The tests were made five times daily, for at least 20 days: A—immediately upon getting up in the morning; B—one hour later; C—just before lunch; D—just before supper; E—just before going to bed. The tasks chosen were such that they could be performed by

the subject without outside help, and in the privacy of his own home. They were: 1—copying a text; 2—transcribing a text into code; 3—sorting cards; 4—dealing cards; 5—multiplication of large numbers; 6—mirror drawing; 7—the ability to keep a stylus in a small hole without touching the edges; 8—the ability to stand upright without swaying. The results obtained indicate a well-marked variation in performance during the day, efficiency of performance (reciprocal of time or errors), increasing up to noon or afternoon, then declining for the rest of the waking period. The body temperature varies in the same sense. There are indications that the temperature is dependent upon the tonus of the skeletal muscles, in that it falls upon lying down and rises upon getting up. If the variations in temperature can be used as a criterion of changes in tonicities of the body musculature, it would appear that the gradual decrease in efficiency toward the end of the day might be due to greater muscular relaxation, which leads to a decrease in the number of proprioceptive impulses reaching the cerebral cortex and makes it increasingly difficult to maintain the state of wakefulness, irrespective of