PLANT TAXONOMY

Chairman: A. A. LINDSEY, Purdue University
CARROLLE A. MARKLE, Earlham College, was elected chairman for 1956

ABSTRACTS

Temperature and time requirements for spring flowering: an analysis of C. C. Deam's thirty-year flowering record in Indiana. ALTON A. LINDSEY and JAMES E. NEWMAN, Purdue University.—Records for 75 species of trees, shrubs, and herbs, kept by Dr. Deam from 1920 through 1952 at the Deam Arboretum, Bluffton, Indiana, showed a much higher correlation of flowering date with temperature than with other environmental factors considered. The 24 species flowering before May 15 that have the longest records were analyzed by IBM machines to determine meteorological threshold, requisite heat sum, and the spring time period for the growth processes which culminate in flowering, for each species. Since use of the mean temperature was found generally unsatisfactory, a new method of summing effective degree-hours was devised, involving a statistically-based formula using the actual high and low for the day and a presumptive threshold. Coefficient of variation was determined by punch-card machine analysis, for combinations of six presumptive thresholds at five degree F. intervals and six presumptive time periods at ten-day intervals. Four graphs made for each species reveal the approximate threshold and time period. The species studied ranged in meteorological (not necessarily physiological) thresholds from 40° to 50°F., with 45° as the common one, and range from 20 to 50 days during which spring temperatures promote flowering. Heat sums range from 2557 degree hours for the very early flowering *Trillium nivale* to 8533 for *Aquilegia canadensis.*

Some Representative Plants of the Different Vegetation Zones in Grand Canyon National Park. JOHN MERKLE, A. and M. College of Texas and Purdue University.—This park is located in northern Arizona and includes the Grand Canyon of the Colorado River. The canyon is a gigantic chasm 217 miles long, 5-16 miles wide and almost a mile deep. This great size plus the elevation of the rims and surrounding country produces several distinct climatic and vegetational zones in the Park.

The Inner Canyon, especially the Inner Gorge, is very hot and dry during the summer. Winters are quite mild. The river near the mouth of Bright Angel Creek is at an elevation of 2500 feet. The elevation of the rim of the Tonto Platform above the Inner Gorge is about 3800 feet, giving a very steep wall of about 1200 or more feet in height. This Tonto Platform extends back from the Inner Gorge a distance of a few hundred feet to nearly a mile and may reach an elevation of about 4500 feet at the base of the Redwall limestone.

The precipitation reaching the Inner Canyon is about 10-12 inches

per year and temperatures regularly reach 110-115° F. during the summer months. The vegetation is sparse and shrubby, including black brush, cacti, yucca, catclaw, mesquite and an occasional century plant.

The elevation of the South Rim is on both sides of 7000 feet. The precipitation is 18-20 inches per year including about 4 feet of snow. The temperature is mostly in the 90's F. during the summer, and there are quite a number of days of freezing weather during the winter. This area supports an extensive stand of Pinyon Pine and Juniper. Associated with them are cliff rose, century plants, yucca, gambel oak, etc. On more favorable sites, highest elevations and in valleys, is a stand of ponderosa pine.

The elevation of the North Rim is on both sides of 8000 feet. This increases to 9200 feet a few miles north at the top of the Kaibab Plateau. The precipitation ranges from about 25 inches at the rim to about 32 inches at the top of the Plateau. This includes from 4 to 10 or more feet of snow.

The vegetation along the rim is pinyon pine—juniper and associates. The ponderosa pine zone extends up to about 8250 feet; a pine-white fir zone up to 8700 feet, and above this and on steep north slopes is a spruce-fir zone.