lectual equipment of every college graduate; not as entitling him to the name of classical scholar, but as enabling him to comprehend his mother tongue and use it to better advantage, and as facilitating the acquisition of scientific terminology.* That minimum should certainly not be less than what, at my suggestion, has long been required for admission to the two years' course preparatory to the study of medicine at Cornell University, *viz.*, the equivalent of four books of Cæsar's 'Gallic War' and of Goodell's 'The Greek in English.'

BURT G. WILDER.

THE NATIVE DAHLIAS OF MEXICO.

THE *Dahlia*, botanically speaking, is purely an American genus confined to Mexico. When the Spaniards first visited Mexico they found a people who had advanced considerably out of the state of barbarism. Not only did these people have well-governed towns, but they were agriculturists and horticulturists. They cultivated fruits and vegetables, and in their gardens were many handsome flowers transplanted from the native soil. The Dahlia seems to have been one of these plants. So struck was he by the beauty of this flower that Hernandez, who visited Mexico in 1615, in his History of Mexico, published in 1651, makes mention of two species, one with pale red flowers which grew in the mountains of Quanhuahuac, and was called by the natives *acoctli*. A little over a century later, M. Thierry Menonville, a well-known French botanist of his time, was sent to Mexico by his government to steal the cochineal insect from the Spaniards. While on his dangerous mission Menonville saw the Dahlia on several occasions, and on his return to France, in 1787, published a book of his adventures, in which he spoke of the beauty of the strange flower which he had seen.

About 1788 some seeds of the Dahlia must have been sent to Madrid, for it is recorded that plants flowered for the first time in the botanic gardens of that city in October, 1789. A few of these seeds were secured by Lord Bute and sent to England, where they flowered in 1790. The plants, however, were soon lost, owing to the mistaken idea that they required stove treatment. About this time this species received the name of *Dahlia coccinea*, the generic name being given by Cavanilles, a Spanish priest and one of the most eminent botanists of his day, who was at that time the head of the Royal Gardens at Madrid. The genus was named in 1791 in the Icones Plantarum by Cavanilles in honor of Andreas Dahl, a Swede, a student and disciple of the great botanist Linnæus. Later, Carl Wildenow, objecting to the name *Dahlia*, on account of its similarity to *Dalea*, renamed the plant *Georgina* after Georgi, a Russian scientist and traveller. According to Salisbury, a second species, *Dahlia variabilis*, was introduced into England in 1804 by Lady Holland, who sent the seeds from Madrid. Its behavior under cultivation is described by Salisbury in his paper read before the Horticultural Society in 1808 and printed in the first volume of the Transactions.

The most successful early cultivator of the Dahlia appears to have been Count Lilieur at St. Cloud. He had four distinct varieties to work on in 1808. The experiments of the florists began in 1813, and a writer in a horticultural magazine of 1818 says that with each new year came new varieties until the kinds seemed almost like new creations, so different were they in color and form. Count Lilieur several years before had purples, dark reds, cherry-reds, buffs and

* Linguistic errors may not vitiate anatomic knowledge, but such inaccuracies as *plexi* as a plural of *plexus*, and *pontic*, *pontine* or *pontal* as the adjective from *pons*, tend to arouse in classical scholars a general distrust of their perpetrators.

even pale yellow flowers. In 1850 the Dahlia appears to have reached the height of its popularity, after which date it began to decline until the year 1870, when the Dahlia Society founded in that year brought about a revival of interest in the plant. In 1872 additional interest was aroused in the Dahlia by the introduction of *Dahlia Juarezii*, the Cactus Dahlia said to have been obtained from Mexico by a Dutch nurseryman, Donkelaar. The organization of the American Dahlia Society within the last two years has added much to the reawakened interest in the plant.

As early as 1841 one English dealer had over twelve hundred varieties. This shows the wonderful variability of the plant, which had been in cultivation practically only twenty-seven years. This, however, is not surprising, when we take into consideration the range of variation of the plant in a state of nature. While visiting the Valley of Mexico last summer the writer had the opportunity, as well as the privilege, of botanizing with the veteran botanist and collector, Mr. C. G. Pringle. The slopes of the southern range of mountains known as the Sierra de Ajusco were visited. The Dahlias were found growing in the greatest profusion on the lava beds, known locally as the Pedrigal, literally the Stony Place. Acres and acres of the Pedrigal in the latter part of August are one mass of color of the most varied hues and shades. As the train of the Mexico, Cuernavaca and Pacific Railroad carries you up from Contreras, at the foot of the Sierra de Ajusco, toward the top, where the Valley of Mexico lies spread out before you as a most pleasing panorama, you are carried up through woods that are a wild Dahlia garden—masses and masses of flaming blooms of three species of *Dahlia* in many distinct colors. Here are associated within a small area many beautiful plants with showy flowers, Bouvardias, Senecios, Stevias and the three species of *Dahlia*, viz: *Dahlia coccinea*, *Dahlia variabilis* and *Dahlia Merckii*.

Dahlia coccinea, *Dahlia variabilis* and *Dahlia Merckii* are three of the most common and best known Dahlias which grow in Mexico. Of these *Dahlia coccinea* has the more northerly and by far the most extensive distribution. From the Cordilleras of Chihuahua, within 200 miles of the United States boundary, it ranges southward through the mountains to Jalisco and the Valley of Mexico.* *Dahlia variabilis* is confined to the region around, including the Valley of Mexico. It is a most striking plant, growing from 5 to 6 feet tall, and bearing flowers ranging in color from purple to sulphur-yellow through the following gradations: lavender-purple, heliotrope, heliotrope-yellow (various shades of lighter and lighter hue approaching yellow) sulphur-yellow. The heads of which the ray florets are colored heliotrope-yellow are in reality of an heliotrope color, the bases of the ligulate corolla being of a yellow color shading off into heliotrope. They are broad (1 inch), long (2 inches) and ovate spatulate.

Likewise, *Dahlia coccinea* shows a remarkable variation in color from cardinal of several shades through scarlet, scarlet-orange, mandarin, orange, lemon-yellow, yellow.† The so-called scarlet-orange rays are scarlet with lines of yellow running through, so that the strap-shaped corolla has a somewhat banded appearance. The ligulate corolla is about an inch long and half an inch broad. The entire head varies in size from two inches in the cardinal ones to three inches in the scarlet-orange ones.

Dahlia Merckii runs from purple to pure white through the gradual fading-out of the

* 1891, Pringle, *Garden and Forest*, IV., 40.

† These colors have been compared with the colored silk samples issued by Belding & Co. and the Maryland Silk Company, Hagerstown, Md.

purple color. One most commonly sees in a state of nature the white heads which are tinted with lavender or pale purple at the base of the ray floret. The heads in each case are nearly uniform in size, being about an inch and three-fourths across.

There are several other species worthy of mention. *Dahlia imperialis*, *D. scapigera*, *D. dissecta* and *D. pubescens*. *Dahlia dissecta* was discovered by Mr. C. G. Pringle growing on limestone ledges fifty miles east of San Luis Potosi. "It is a very unique species, being scarcely more than two feet high and of bushy habit from an almost woody base." The flower heads are two or three inches broad, with about eight mauve colored rays. *Dahlia pubescens* was found by the same botanist on calcareous bluffs of prairies bordering the valleys of small streams in the State of Mexico and to the north of Toluca. It is a small plant, one and a-half to two feet high, with heads two to three inches broad, with a yellow disc surrounded by eight rays which are purple, with lines of deeper color which changes with age to light purple or dull rose.

The tubers of these plants, particularly those growing on the lava beds along the southern mountainous rim of the Valley of Mexico, are hard to obtain, because of the depth to which they sink in the lava pockets. All of the species store up in their tubers a substance called inulin, chemically allied to starch. The substance is in solution in the cell, much as sugar is, but crystallizes out in needle-shaped crystals upon the addition of alcohol. This substance is stored up as a reserve food to meet the demands of the plant during the active growing season, and the tubers with this stored substance perpetuate the species during the long droughts which are frequent in Mexico.

The dry season in the region of the Valley of Mexico lasts from about the first of October until about the first of June, when there are signs of the returning rainy season. During the drought the tubers of the Dahlias lie dormant until the first rain moistens the soil, when they spring up in great numbers everywhere on the lava beds. The plants grow vegetatively until the end of August, when they flower in the greatest profusion. The rainy season is characterized in the Valley of Mexico by afternoon thundershowers. The morning will be cool, and the air bracing, until evening, when the sky becomes overcast and the rain comes down sometimes in torrents.

A consideration of these meteorological conditions ought to influence the cultivation of the Dahlia, which has not been entirely understood. It will repay some energetic nurseryman to obtain fresh tubers directly from the mountains of Mexico by a personal visit to the native home of the plant. It will repay him to collect tubers of every plant with a different shade of color. As already intimated, the plants in a state of nature are extremely variable. This variation in nature, as compared with the variation produced by cultivation, is just as striking, and shows us that many of the species are in an extremely unstable state of equilibrium as regards their plasticity. This great plasticity in a state of nature explains how so many new colors and forms originated, almost as if by magic, when the Dahlia was first introduced into cultivation. The inherent possibilities of color and form were represented in the protoplasm, and only needed the stimulus of a varied culture to bring out these latent acquired characteristics.

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CURRENT NOTES ON ANTHROPOLOGY.

Inscription of the Cross at Palenque.

This most famous of all the Mayan inscriptions has been subjected to a searching analysis by Dr. Förstemann (in *Globus*, Vol.