42765. ENGELHARDTIA ACERIFLORA (Reinw.) Blume. Juglandaceæ.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received May 16, 1916.

A very tall tree, with compound leaves somewhat like those of the walnut, and inconspicuous flowers disposed in drooping, spicate panicles. These are succeeded by little fruits which are about the size of a pea, each seated on the base of a three-lobed, beautifully veined and colored bract. These are often more than a foot long and hang very gracefully among the foliage. (Adapted from *Lindley, Treasury of Botany, pt. 1, p. 451.*)

42766. RUBUS ULMIFOLIUS BELLIDIFLORUS (Koch) Focke. Rosaceæ. **Bramble.**

From Amsterdam, Netherlands. Presented by the director, Botanic Garden, University of Amsterdam. Received May 15, 1916.

A very handsome, double-flowered pink bramble, commonly used for planting in England. Each flower produces an extraordinary number of narrow petals, making a gay display in July and August. This bramble is highly recommended for half-shady woodlands.

42767. PAVETTA ZIMMERMANNIANA Valet. Rubiaceæ.

From Buitenzorg, Java. Seeds presented by Dr. J. C. Koningsberger, director, Botanic Gardens. Received May 12, 1916.

A small rubiaceous tree or shrub, with opposite, nearly elliptic leaves and clusters of small, slender-tubed white flowers.

"The remarkable researches of Zimmerman and Faber (detailed in the Jahrbücher für Wissenschaftliche Botanik, vol. 51, p. 285, 1912, and vol. 54, p. 243, 1914) make this species of unusual interest. Faber has proved that the leaves of this and of several other species of Pavetta, Psychotria, and possibly other genera of the Rubiaceæ contain colonies of a nonmotile, nitrogen-fixing bacterium which he names *Myco-bacterium rubiacearum.* The bacteria of this genus almost invariably inhabit the micropyle of the young seed, and, when the seed germinates, grow through certain stomata of the very young leaves and into the intracellular spaces formed in the leaf tissues around these stomata. Cavities are formed through the growth of the epidermal cells which later close entirely and make bacterial nodules which are deeply imbedded in the leaf tissues. A single leaf may have several dozen of these symbiotic bacterial nodules. Faber was able, by treating the seeds with hot water and a sublimate solution, to kill the inhabiting myco-bacteria and, later, to infect part of the seedlings grown from these seeds with pure cultures of the bacterium. The artificially infected seedlings grown in soil free from combined nitrogen grew well and remained healthy for four months, whereas those not so infected turned yellowish white and died in three or four weeks. The plants from unsterilized seeds produced leaves bearing many more bacterial nodules than did those from sterilized seeds which were later artificially inoculated. In view of the facts that these rubiaceous plants with bacterial nodule-bearing leaves occur in many parts of the Tropics and that in India, at least, the value of their leaves for manure has long been recognized, and considering the value of nitrogen-fixing legumes as fertilizers, the suggestion of Faber that we may have in these tropical trees and shrubs plants of positive agricultural value for the tropical planter is well worthy of consideration. The value of