

A BUD VARIATION OF EUONYMUS

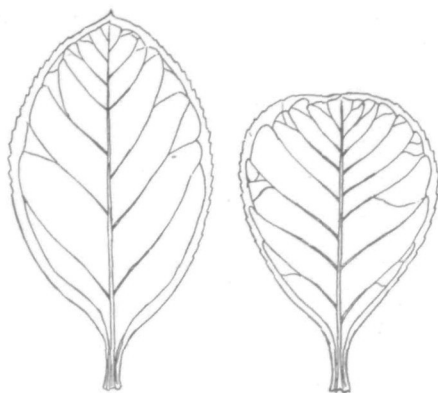
A. D. SHAMEL, *Riverside, Cal.*

THE accompanying photograph (Fig. 5), shows a small limb of *Euonymus japonicus*, an ever-green shrub, belonging to the family Celastraceae.¹ The leaves of this species are normally rounded ovate. The margins of the leaves are toothed. The color of the foliage is a deep green. The small pale green flowers are composed of four petals, are usually borne two to five together on a stalk in the axils of the leaves, and are succeeded by top-shaped seed-vessels of three blunt lobes, and as many cells, each containing a solitary seed. In Southern California during the winter months these fruits become more conspicuous among the leaves by assuming a pink color which makes them highly ornamental. The lobes of the capsule, finally assuming a bright rose color, open at a projecting angle and disclose the seed wrapped in an orange-colored arillus. The foliage, flowers, and fruit are said to be poisonous, but the fruits are sometimes used as a dye. The wood, which is of a light yellow hue, being strong, compact, and easily worked is applied in some countries to many useful purposes; e. g. skewers, pegs for shoes, spindles, etc. The charcoal made from the young shoots is used by artists on account of its smoothness and ease with which it is erased.

In Southern California this shrub is highly prized and commonly used for ornamental plantings, sometimes for hedges and otherwise for individual shrubs. Eight or more varieties of this species are propagated commercially by California nurserymen. Of these *E. japonicus argenteo-variegatus* (Silver variegated *Euonymus*) is the one most commonly found in the gardens and other ornamental plantings in the vicinity of Riverside. This variety, on account of its variegated foliage, the silver-like margins and irregular stripes of the

leaves, is very striking in appearance even from a considerable distance. The shrubs have an upright habit of growth. It was developed from branch variations of *E. japonicus*, an example of which is shown in the accompanying photograph.

In the variegated form the leaves differ from the ordinary form particu-



CHANGE IN LEAF FORM

At the left is the ordinary leaf of *Euonymus*, at the right the leaf of the variegated form. It is evident that the same bud variation which produces the change in color, also produces changes in numerous other features. (Fig. 6.)

larly as regards shape and color. The shape of the ordinary leaf is ovate with an obtuse apex. The shape of the variegated leaf is obovate and the apex is usually truncate or retuse. (See Fig. 6.) The margins of the leaves of the ordinary form are usually serrate, while the serrations of the variegated leaves are much less marked, so much so in some cases as to be almost invisible without very close inspection.

The color of the ordinary leaves is a uniform deep green, slightly deeper in shade on the upper than on the under

¹ The Treasury of Botany, part I, p. 475.



THE ORIGIN OF A VARIETY OF EUONYMUS

On this green shrub, part of a branch has become variegated, due to some internal change which has affected the pigment. But internal changes of this sort are apparently never confined to a single character. Not only is the color of the leaves changed, but their shape is likewise altered, and the difference in appearance extends to the stem. Changes of this sort are rather common, and probably have not much importance in normal evolution, but they are sometimes of much value to gardeners, many ornamental varieties of plants having originated in the same way that the silver-variegated *Euonymus* did. (Fig. 5.)

sides. The color of the variegated leaves is very light green, very different from the color of the ordinary leaves, so much so in fact that it can be easily distinguished by even the most casual observer. The variegated leaves usually have a narrow margin of white or silver color around or nearly around the entire leaf. Irregular areas or stripes of white or silver color usually mark the upper surface of the remainder of the variegated leaf area, while the under surface is usually of a more uniform color.

The stems of the variegated branches are of a silver color in contrast with the uniform green of the ordinary stems.

I have found green branches frequently occurring in variegated shrubs, and variegated branches in green shrubs.

A propagator of Riverside informs me that he has repeatedly propagated both varieties from bud variations through the selection of cuttings. In this way, he has isolated the variegated form from the green one, and the green form from the variegated.

This case is presented as an instance of the origin of a valuable cultivated variety of plants through the propagation of bud variations. It is probable that some of the other varieties, if not all, of *E. japonicus* have been developed from bud variations.

It is also a good illustration of the fact that a bud variation rarely affects one character of the plant alone; it frequently produces changes in many different characters simultaneously.

A Valuable Text-Book of Animal Breeding

THE BREEDING OF ANIMALS, by F. B. Mumford, dean of the college of agriculture and director of the experiment station of the University of Missouri. Pp. 310, price \$1.75. New York, The Macmillan Co., 66 Fifth Avenue, 1917. (Rural Text-book Series, L. H. Bailey, Editor.)

Most of the questions which a livestock breeder asks are answered in Dean Mumford's book, which can be cordially recommended. Reproduction, inheritance, and development all receive full discussion, illustrated with numerous examples, and with the omission of most of the unnecessary technicalities. Of course, neither this book nor any

other will teach a man how to become a successful breeder; that art can be learned only by practice. Professor Mumford's chapter on "The Practice of Breeding" is perhaps not quite up to the standard of the rest of the book, but it is really difficult to say anything on that subject, which will be of value for immediate application. On the whole, however, his book gives the facts which the breeder, whether a novice or an old hand, wants to know, and it is marked by sound judgment. The errors noticed are few and of minor importance.

Families of American Men of Science

Ten per cent of the well-known American men of science are unmarried, according to J. McKenn Cattell, who has studied the histories of 1,000 of them (*The Scientific Monthly*, March, 1917). Considering their ages, a scientific man is more likely to be married

than a man taken at random from the community. At the average age of 29.5 years, they married wives aged on the average, 26.6 years. The American men of science have on the average seven-tenths of an adult son, each. Family limitation is much practised.

The Number of Chromosomes in Man

The exact number of chromosomes in the germ-cells of man has long been in doubt. H. L. Wieman of the University of Cincinnati reports, in the *American Journal of Anatomy* (January, 1917), a study which convinces him

that the reduced number is twelve, one of which is the sex-chromosome. The number is the same in both negro and white races, he finds—previous work had led to the belief that the negro had twice as many as the white.