chased in 1894. At the beginning of his enterprise Frasch had introduced John D. Rockefeller's brother into his company, but, during the long years of hard and unsuccessful work and the beginning of the mine, Rockefeller lost heart and sold his interest out, thereby throwing away a yearly income of between $250,000 and $500,000. The real extent of Herman Frasch's wealth did not become known until after his death in Paris. His friends had always thought him a fairly wealthy man, but were amazed at the sensational figures of his millions which were disclosed afterward.

THE HISTOLOGY OF CASTELA NICHOLSONI.

BY C. J. ZUFALL.

Castela Nicholsoni is known in America as *Chaparra Amargosa* (Mexican for "bitter bush") and on the Island of Antigua as "Goatbush." This drug, although not widely known, is of considerable importance in the Southwest where it is employed in the treatment of amebic dysentery. One physician[1] states, "it is the most efficient remedy we have at the present for the treatment of this disease, unless we except emetine."

In 1883 J. L. Putegnat[2] made a brief study of the drug but did not describe the plant fully or give its histology. He determined the percent of extractives with various solvents and briefly studied the bitter amorphous principle, to which his father, J. L. Putegnat, had given the name "amargosin."

Hooker[3] first described the plant, a specimen of which was sent him by Dr. Nicholson of Antigua. Determining that it belonged to the family Simarubaceae and the genus *Castela*, but finding it not to conform to the descriptions of the known two species of *Castela*, he placed it as a new species and called it *Castela Nicholsoni* in honor of Dr. Nicholson.

The following is a translation of Hooker's description of *Castela Nicholsoni*:[3]

The main stem or trunk not exceeding four feet, much branched; branches provided with short axillary spines; small branches terete, silky-hoary. Leaves evergreen, alternate, sparse, in scattered groups, sessile, coriaceous, elliptical, mucronate, silky-gray beneath and margin revolute.

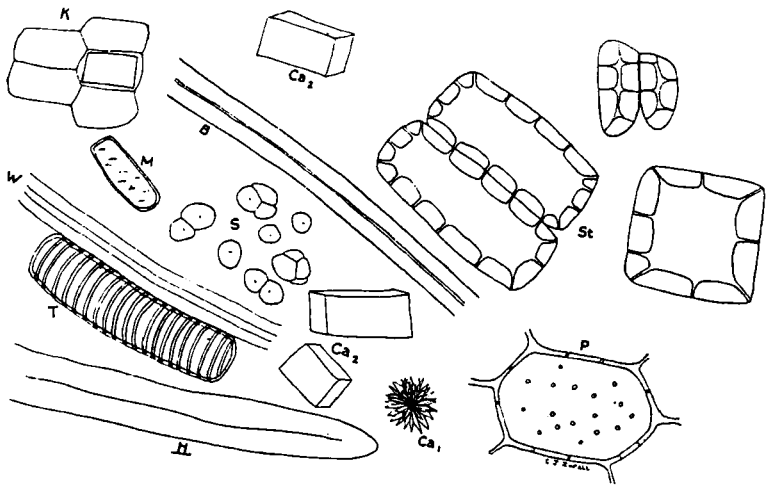
Flowers small, saffron- or orange-colored, dioecious. Peduncle axillary, short, one- or two-flowered.

Staminate flowers:—Calyx four-parted nearly to the base, segments ovate, variegated, persistent. Petals: four, ovate, spreading, deciduous. Stamens: eight, short, hairy, inserted on the fleshy receptacle. Anthers oblong, divided or sagitate and yellow.

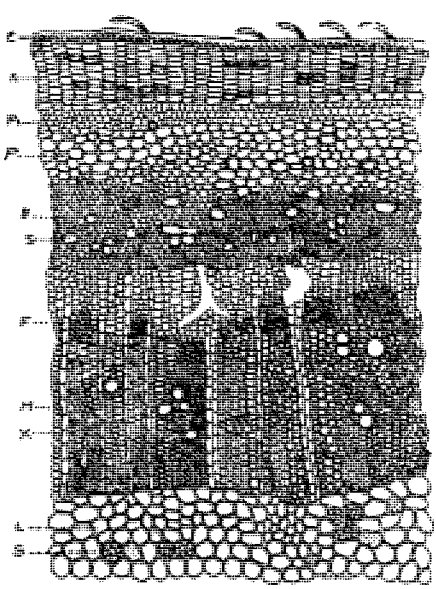
Pistillate flowers:—Calyx and corolla, same as in staminate flowers. Ovules: four, contiguous, one or two frequently abortive. Style short or none. Stigmas: four, small, and subulate. Stamens: eight, short, abortive, hirsute and adherent. Drupes: four, subglobose, base acuminate or short pedicelled, small, purple or red when mature. Nut compressed, ovate, bivalved, rugose, unilocular. Seeds suspended, sub-ovate, compressed. Albumen small, thin, flesh-colored. Embryo almost as large as the seed. Cotyledons straight, foliaceous.

Dr. Nicholson observes that "it is a beautiful little shrub, especially when in fruit. It is found growing in the utmost luxuriance in an arid calcareous soil where everything else is burnt up."[3]

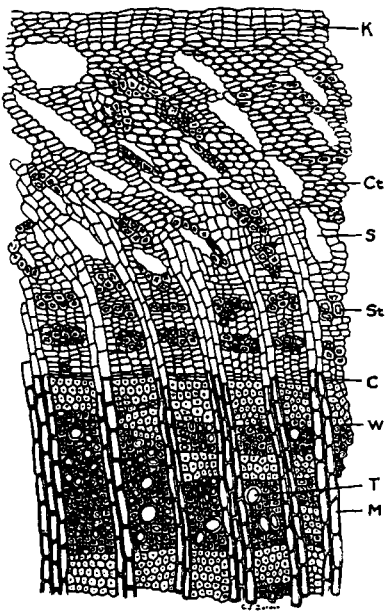
In America it is found in "southwest Texas and northern Mexico growing on thin, rocky, mesquite or post-oak land, and having an especial tendency to be found on small rocky hills."[1]



Elements found in powdered *Chaparro Amargosa:* St, stone cells; P, parenchyma cell of pith; Ca_1, calcium oxalate from leaf; Ca_2, calcium oxalate from root bark; S, starch grains; H, hair; T, trachea; W, wood fibre; M, medullary ray cell; K, cells from cortex, one containing a monoclinic crystal of calcium oxalate; B, bast.



Chaparro Amargosa. Transverse section of stem: E, epidermis; K, cork; Ph, phellogen; P, parenchyma; B, bast; St, stone cell; F, phloem; M, medullary ray; X, xylem; L, lignified parenchyma; S, starch.

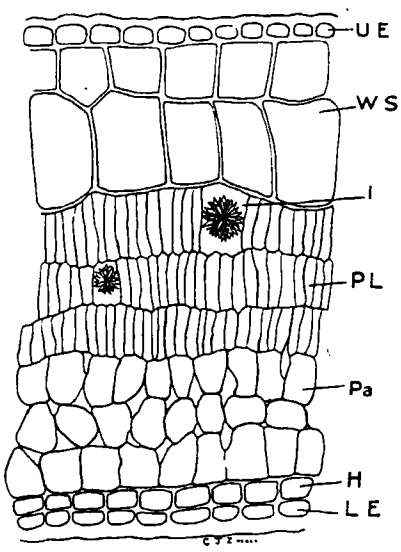


Chaparro Amargosa. Transverse section of root: K, cork cells; Ct, cortex; S, schizogenous cavities filled with a yellowish mucilage; St, stone cells; C, cambium; W, wood fibres; T, trachea; M, medullary ray.

It is also mentioned as being found on bluffs along the Rio Grande and its tributaries.[4]

The drug consists of the entire plant, all parts of which contain the bitter principle.[1] The stems reach a length of 12 dm. and a diameter of 15 mm. They are rough, of an ash-gray color and frequently covered with lichens, while the branches are covered with hairs and tipped with sharp points. It is very hard and the fracture is very tough and splintery. If cut smooth, the end shows a green bark about one mm. thick, the light-yellow wood has several rings of darker wood-fibres and the pith is about one-tenth the whole diameter.

The root is much larger than the stem, having a diameter of 20 to 45 mm. It is twisted and irregular in shape and covered with a rough, gray and cinnamon-brown bark which is furrowed and sometimes 6 mm. thick. In transverse section this bark shows a radiate structure, the rays being undulate which is characteristic and aids in distinguishing this from other hard and tough roots used in medicine. The wood is similar to that of the stem.



Chaparro Amargosa. Transverse section of leaf: U E, upper epidermis; W S, water-storage cells; I, idioblast containing a rosette aggregate of crystals of calcium oxalate; P L, palisade cells; Pa, parenchyma; H, hypodermal layer; L E, lower epidermis.

The dry drug has no odor but upon soaking in water an unpleasant nauseating odor develops.

Microscopically the transverse section of the stem is quite interesting and has a characteristic structure. The epidermal cells have very thick outer walls and some of the cells are modified to form non-glandular hairs in which the lumen is almost indistinguishable. There is a sub-epidermal layer of cork containing stone cells; then the phellogen, phelloderm and primary cortex followed by a thick layer of bast in which are many stone cells. Between this and the wood is the peculiar phloem. The xylem consists chiefly of wood fibres, tracheae being very few. The medullary rays are one to two cells wide and contain starch. The pith contains much starch and is made up of thick-walled polyhedral cells whose walls are lignified and marked with narrow slit-like pores.

The leaf is typical of the Xerophytes, being very small and well protected by a thick-walled epidermis and on the ventral surface by many hairs similar to those of the stem. Beneath the upper epidermis are two rows of large, thin-walled water-storage cells similar to the corresponding structure of the leaf of *Ficus elastica*. The palisade structure is made up of three or four layers of very narrow cells, among which are found idioblasts containing calcium oxalate in rosette aggregates. The parenchyma is compact, with small intercellular spaces, and next to the lower epidermis is a distinct layer of what may be called hypodermal cells.

Powder:—Starch grains abundant in pith and medullary rays; grains angular or spherical; four to nine microns in diameter, point of origin central, indistinct,

not cleft; lamellae indistinct. Medullary ray cells have thick walls marked with many simple pores. Calcium oxalate in large monoclinic and twin-form crystals; in root bark abundant. A few rosette aggregates from the leaf. Stone cells many, square, rectangular, irregular and with thick walls. Parenchyma cells of pith large, walls thick, lignified and marked with small circular pores. Tracheae few with spiral markings. Bast fibres abundant, long with very narrow lumen. Wood fibres abundant. Non-glandular hairs with very narrow lumen. Leaf fragments few.

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THE SIMULATION OF DISEASE.

Reprint No. 433 from the *Public Health Reports* was issued November 9, 1917. This was prepared by A. G. DuMez, technical assistant in the Hygienic Laboratory, U. S. Public Health Service. In this paper some of the many methods employed for effecting simulation of disease by the use of drugs, chemicals and septic materials are given. The subject is of considerable interest at this time and its study is of some importance to pharmacists, in view of the fact that the services they may be called upon to render will include investigations of this kind. It is surprising to note the many means that are employed for inciting conditions that simulate diseases and the knowledge that must obtain with some of these methods. The substances enumerated in this paper are grouped under the diseases, the diagnostical signs of which their use is to simulate. Brief outlines of the methods recommended for the detection of these frauds are also included, where specific information of this kind has been available.

The divisions are: Substances used in simulation of diseases of the skin and subcutaneous tissue; of the eye; of the ear; of the throat; of the respiratory system; of the digestive system; of the circulatory system; of the kidneys; of metabolism and other diseased conditions. As an example for simulating eczema: After abrading the skin by scraping with a sharp-edged instrument or rubbing with some rough material, one or more of the following are applied: Croton oil, sulphur, acid substances, oil of cade, ointment of mercury, or mezereum bark. For detection, according to Blum (1916), the eruptions produced may be distinguished from those of the true disease by the fact that they are disseminated and do not form confluent masses. Furthermore, the skin, after the removal of the crust, does not appear red, dry, and hypertrophied, as in true eczema.

It is surprising to note the extent to which these men will go in applying injurious substances to bring about simulation of diseases. The results from some of these are doubtless apt to be permanent and remind them hereafter of their attempt at deception.

Quite a lengthy bibliography follows and reprints may be obtained from the usual source, namely, Superintendent of Documents, Government Printing Office, Washington, D. C.