

and aluminum and iron hydroxides amounting to about 10 per cent.

The name *vegasite*⁸ is suggested for the mineral from Las Vegas, the principal town of the county in which it occurs. Briefly, *vegasite* may be characterized as a mineral giving chemical reactions similar to those of *plumbojarosite*, but distinguishable by widely different optical constants.

BOTANY.—*Eysenhardtia polystachya*, the source of the true *Lignum nephriticum mexicanum*.¹ WILLIAM EDWIN SAFFORD, Bureau of Plant Industry.

INTRODUCTION AND HISTORY

Among the wonderful products of the New World brought to Europe shortly after the discovery of America was a Mexican wood supposed to be efficacious as a diuretic and therefore called *lignum nephriticum*. Water kept in cups of this wood and an infusion of its chips in spring water had the remarkable property of reflecting a blue color, though apparently colorless or yellow when held up to the light in a glass receptacle. This led to the experiments of Athanasius Kircher,² in 1646, and afterwards to the more systematic study by the Hon. Robert Boyle, in 1663, which may be regarded as the first serious investigation of the phenomenon now known as fluorescence.³ One result of Boyle's work was to make *lignum nephriticum* a classic wood. Strange to say, however, the botanical identity of the plant from which this wood was derived has remained uncertain until the present day. Though celebrated throughout Europe in the 16th, 17th, and the early part of the 18th centuries, scarcely a fragment of

⁸ The "e" in the first syllable should be given the Spanish pronunciation: like "a" in late.

¹ Based upon a paper entitled "The rediscovery of *Lignum nephriticum*," read by the author February 2, 1915, at a meeting of the Botanical Society of Washington. Published with the permission of the Secretary of Agriculture.

² "Of a certain wonderful wood coloring water all kinds of colors," in *Ars Magna Lucis et Umbræ*, pp. 77 and 78. 1646.

³ Boyle, Robert, *Experiments and considerations touching colours*, p. 203. 1664.

it is now to be found in drug collections, and its very name has disappeared from encyclopedias.

Monardes (1565) was the first to call attention to the wood, but he knew nothing of its origin except that it came from Mexico. Hernández, writing about the year 1576, described the plant producing it under the name *coatl*, or *coatlí*, as follows: A shrub or tree with leaves like those of a chick-pea (*Cicer arietinum*) but smaller, and with spikes of small longish flowers. The color of the flowers he described as yellow and faded; but he evidently drew his description from dried material, as was the case with the majority of plants described by him, which were gathered and brought to him by Indian herb doctors. Hernández was a physician rather than a naturalist, and many of his descriptions and illustrations of both plants and animals are so crude as to be unrecognizable. Of *lignum nephriticum* he gave no illustration. He was even uncertain regarding the plant producing it, stating that they had described it to him as a shrub, but that he had seen specimens of it exceeding very large trees in size. Hernández's work on the products of Mexico remained in manuscript for almost two centuries and never appeared as a whole. The portions of it relating to medicine were grouped together and prepared for publication by Nardo Antonio Recchi; but owing to lack of funds or for some other reason Recchi's compilation did not appear until 1751, seventy-three years after Hernández's death, though a Spanish translation from Recchi's Latin manuscript by Fray Francisco Ximénez appeared in 1615, in the city of Mexico.

In the meantime the plant itself remained unidentified botanically. Caesalpinus (1583) and Caspar Bauhin (1623) supposed it to be a species of *Fraxinus*. Terrentius, in Recchi's epitome of Hernández (1651), referred it to the Leguminosae but did not attempt to identify it. Johan Boeclerus (1745), believing it to be a *Laburnum*, called it *Cytissus mexicanus*. Linnaeus, in his *Materia Medica* (1749), added to the confusion by referring it to *Moringa pterygosperma*, an East Indian tree, in spite of the fact that it was originally declared to be of Mexican origin; and Gui-

bourt, in his *Histoire abrégée des drogues* (1820), identified it with the West Indian cat's-claw (*Mimosa unguis-cati* L.).

The first to indicate its true botanical classification was Dr. Leonardo Oliva, Professor of Pharmacology in the University of Guadalajara. In his *Lecciones de Farmacología*⁴ he identified it with *Varennea polystachya* DC. (*Viborquia polystachya* Ortega; *Eysenhardtia amorphoides* H.B.K.). Subsequent authorities, however, did not accept his identification. Dr. Fernando Altamirano (1878), while recognizing the identity of the *coatlí* of Hernández with the tree called by the modern Mexicans *palo dulce* and referring it to *Viborquia polystachya* Ortega, was not aware that the latter was the same as *Eysenhardtia amorphoides* H.B.K., and he followed Alfonso Herrero in referring lignum nephriticum to *Guilandina moringa*, a mistake which may be traced at once to Linnaeus. In describing the uses of *coatlí* wood by the modern Mexicans, he states that the country people make drinking-troughs of it for their fowls, to guard against certain epidemics to which the latter are subject; or, if the vessel from which they drink is of some other substance, they put a piece of the wood in the water and allow it to remain there. The water assumes a blue color, he says; but Mariano Barcena, who experimented with it, observed that the blue color was the result of the refraction of light, and the water, instead of yielding a blue coloring matter like indigo, yielded a yellowish brown dye-stuff.⁵

Sargent, in his *Silva of North America*, gave an amended description of the genus *Eysenhardtia*, in which he for the first time established the combination *Eysenhardtia polystachya*, but it is evident that he was unaware that this species had anything to do with lignum nephriticum, or that its wood yielded a fluorescent infusion. Concerning it he simply says: "The wood of some species is hard and close-grained and affords valuable fuel. The genus is not known to possess other useful properties."⁶

The third edition of the *Nueva Farmacopéa Mexicana* (1898)

⁴ 2: 429. 1854.

⁵ Altamirano, Fernando, "Leguminosas indígenas medicinales," in *La Naturaleza*, 4: 97-98. 1879.

⁶ Sargent, C. S. *The Silva of North America*, 3: 30. 1892.

repeats Oliva's observations under the heading "Taray de Mexico," but in a footnote states that *leño nefritico* had been erroneously attributed to *Varennea polystachya*, or *Eysenhardtia amorphoides* H.B.K., and that its classification was not known.⁷ In a subsequent edition of this work the name *palo dulce* is omitted, except as applied to the European licorice. Flückinger and Hanbury, in their well known *Pharmacographia* (1879), are silent about *lignum nephriticum*, although for years before the publication of this work Hanbury had been seeking to identify it.⁸ Dragendorff refers to it as a species of *Guajacum*.⁹ Otto Stapf, however, guided by Ramírez and Alcocer's *Sinonimia vulgar y científica de las plantas Mexicanas* (1902), referred a piece of wood labeled "*cuatl*" in the Paris Exposition to *Eysenhardtia amorphoides*; but the wood was unaccompanied by botanical material by which it might be identified with certainty.¹⁰ He gives a history of the wood known as *lignum nephriticum* in early literature, and also quotes several Mexican authorities but not Oliva, cited above. He accounts for the fact that the flowers were described by Hernández as yellow by the supposition that there are varieties of *Eysenhardtia* yielding *lignum nephriticum* which have yellow flowers, although, as a matter of fact, no such forms occur in the localities cited by writers on the subject; and the only species in which the flowers are yellow are low scrubby plants which never attain the size even of a small tree or have a stem with a diameter approaching the dimensions of the pieces of *lignum nephriticum* hitherto described.

The last author to investigate the origin of *lignum nephriticum* is Dr. Hans-Jacob Möller, of Copenhagen, who after an exhaustive study of the subject referred it to a Mexican tree belonging to the

⁷ Nueva Farm. Mex. 153. 1896.

⁸ See Oliver and Hanbury, in Admiralty Manual of Scientific Inquiry, p. 391. 1871. "Lignum nephriticum.—This rare wood, noticed by some of the earliest explorers of America, is a production of Mexico. To what tree is it to be referred? Its infusion is remarkable for having the blue tint seen in a solution of quinine."

⁹ Das Lignum nephriticum der älteren Medicin wird wohl von einer Guajacum-Art stammen." Dragend. Heilpfl. 345. 1898.

¹⁰ See Stapf, Otto. Kew Bull. Misc. Information, 1909, pp. 293-305. 1909.

genus *Pterocarpus*. Dr. Möller made a careful examination of the various woods hitherto supposed to be the true lignum nephriticum mexicanum, among them specimens of the wood of *Eysenhardtia amorphoides*, sent to him by C. A. Purpus, the latter described as "das Kernholz von einen recht dicken Ast," but with negative results ("keine Fluoreszenz).” On examining the heartwood of a Philippine species of *Pterocarpus*, however, he found that in water containing lime it yielded an infusion having the characteristic sky-blue fluorescence of lignum nephriticum mexicanum as described by early investigators. He therefore assumes that the mother-plant of lignum nephriticum mexicanum, "sought in vain for 300 years by so many investigators, is a Mexican species of *Pterocarpus*," in all probability *Pterocarpus amphymenium* DC. (*Amphymenium pubescens* H.B.K., *Pterocarpus pubescens* Sprengel); and he refers a second kind mentioned by Hernández, endemic in Quauchinango, to *Pterocarpus orbiculatus* DC.¹¹

There can be no doubt that the heartwood of some species of *Pterocarpus* does yield a fluorescent infusion; but the "lignum nephriticum mexicanum," or "coal," of Hernández, the leaves of which are described as "resembling those of *Cicer arietinum* but smaller," and which are also compared with the finely divided leaves of the common wild rue, cannot possibly be identified with any known Mexican species of *Pterocarpus*. The leaflets of the species of *Pterocarpus* figured by Möller himself exceed 6 cm. in length by 3.5 cm. in breadth.

IDENTIFICATION OF LIGNUM NEPHRITICUM

In connection with his work on the economic botany of Mexico the writer has for years been seeking the source of lignum nephriticum. Among other woods examined for the blue fluorescence characterizing this wood were specimens of branches of *Eysenhardtia polystachya*, collected by the writer in 1907 in the vicinity of Aguascalientes, the infusion of which gave no evidence of fluorescence in ordinary sunlight. From this fact and from the

¹¹ Möller, Hans-Jacob. Lignum nephriticum. Berichte der Deutschen Pharmaz. Gesellsch. 23: 88-154. 1913.

fact that all specimens seen by the writer were either shrubs or trees too small to yield wood for the manufacture of bowls and cups, the writer was inclined to agree with Möller in discarding *Eysenhardtia* as a source of the famous wood. In July, 1914, however, specimens of a medicinal wood from Mexico were brought to the writer accompanied by herbarium material from the same tree sufficient to identify it. It proved to be *Eysenhardtia polystachya*, commonly known by the modern Mexicans in many localities as *palo dulce*, or "sweet wood." Its collector had not noticed anything peculiar about the color of its infusion, but dwelt upon its efficacy as a cure for certain diseases to which fowls are subject in Mexico. The wood was a section of a tree trunk, which deprived of its bark was 7 cm. in diameter, and which, unlike all specimens of *Eysenhardtia* wood hitherto seen by the writer, consisted chiefly of dark brown, dense, fine-grained heartwood very much like *Guaiacum officinale* in appearance, surrounded by a ring of brownish-white sapwood 5 to 8 mm. thick. A few small chips of the heartwood in ordinary tap-water tinged the latter a golden yellow, which soon deepened to orange, and looked like amber when held between the eye and the window. When the glass vial containing the liquid was held against a dark background the liquid glowed with a beautiful peacock blue fluorescence, very much like that seen in quinine. Placed partly in a sunbeam, half of the liquid appeared yellow and the other half blue; and when the sunlight was focused upon it by the lens of a common reading glass, the vial appeared to be filled with radiant gold penetrated by a shaft of pure cobalt. There was no longer any doubt as to the identity of the wood. It could only be the true lignum nephriticum of Robert Boyle's experiments; and it was undoubtedly the wood of *Eysenhardtia polystachya*, a tree with small pinnately compound leaves which might well suggest those of a chick-pea or of the common wild rue of Spain, and with spikes of small flowers which had turned yellowish in drying, corresponding with Hernández's description of the *coatl* of the Aztecs.

Chips of the sapwood tinged tap-water only slightly at first, but when left over-night the infusion deepened to a greenish

yellow and glowed with a decided fluorescence. With distilled water neither the sapwood nor the heartwood produced fluorescence, as seen by ordinary sunlight; but this phenomenon was distinctly visible when, at the suggestion of Dr. Arno Viehoveer, U. S. Department of Agriculture, these infusions were held in the ultraviolet rays of a fluorescence lamp, and it was also displayed in ordinary daylight when a small amount of sodium carbonate or other alkali was added to the infusions of the wood in distilled water. On boiling chips of the wood in tap-water for several hours a deep amber-colored extract was obtained not unlike Madeira wine in color. When placed on the table the surface of this extract appeared to be outlined by a deep blue marginal ring, and when held away from the light the fluorescence of the liquid gave it the appearance of certain mineral oils. A drop of the extract in a glass of water caused the whole glass to glow with fluorescence when held in the rays of the sun admitted through a hole in a screen.

At a conversazione at the house of Dr. Alexander Graham Bell, on the evening of January 6, 1915, at which the wood and accompanying herbarium material were shown by the writer, specimens of the infusion when exhibited by ordinary electric light failed to show fluorescence; but afterwards, when held in the rays of an arc light the liquid glowed with an intense blue which illuminated the faces of those standing near by.

Experiments were made by Dr. Lyman J. Briggs, Biophysicist of the Bureau of Plant Industry, with a view to determine the possible value of lignum nephriticum as an indicator in titrimetric determinations. The result of Dr. Briggs' observations have not been published, but he recognized at once the advantage which this, like other fluorescent substances, must have over those indicators which show color changes only by transmitted light, especially in testing dark liquids, in which the color of the liquid masks the color changes of the indicator. Eysenhardtia wood has one great advantage over fluorescein itself, from the fact that its extract is readily soluble in cold water. With most acids it does not fluoresce, but in the presence of acetic acid its fluorescence is not destroyed. It cannot, therefore, be used as

an indication of alkalinity in all cases. As compared with phenolphthalein it has a neutral point nearer the acid end of the scale; that is to say, it will fluoresce in a solution in which phenolphthalein develops no color whatever.

FURTHER BOTANICAL HISTORY

As already stated, the first description of the plant yielding lignum nephriticum is that of Hernández, written about the year 1575, but first published in the form of a Spanish translation, in the city of Mexico, by Ximénez, in 1615. It is as follows:

They call *coatl* a plant which they describe as a shrub; but I have seen it larger than very large trees; and some call it *tlapalezpatli*, or "blood-red medicine." It is a large shrub which has a thick trunk devoid of knots, like that of a pear tree. The leaves are like those of the garvanzo [*Cicer arietinum*], but smaller and almost like those of rue [*Ruta chalepensis* L.] and somewhat larger, a mean between these two extremes; the flowers yellow and faded, small and longish, are arranged in spikes. . . . It grows in moderately warm regions like the valley of Mexico, and in still warmer situations like Guachinango [state of Puebla], Chimalhuacan [district of Texcoco], Chalco, and Tepuztlan [near Cuernavaca, state of Morelos] and almost throughout the entire extent of the *malpais* [pedregal or lava-beds] of Coyohuacan; and in many other places.

Following Monardes, whose description of the wood he quotes, the author tells of the blue color of the infusion of the wood and of its virtues as a diuretic; and he adds: "There is another kind of plant of this nature, but it does not color the water;" and on his return trip to Spain he says: "In this fleet there is a Visçayan merchant who is taking more than fifty large logs of this wood to Spain."

From the above description it is evident that Hernández refers to two distinct species, the first of which, with leaves resembling those of *Cicer arietinum* and *Ruta chalepensis* and with spikes of small longish flowers, is undoubtedly *Eysenhardtia polystachya*, which never exceeds the size of a small tree. It was undoubtedly the wood of this species which Robert Boyle used in making his experiments on fluorescence. The second is in all probability one of the trees called by the Aztecs *tlapalezpatli*, or *tlapalizpatli* (from *tlapalli*, tincture; *eztli*, blood; and *patli*, medicine),

and by the Spaniards *sangre de drago*, or dragon's blood. Among the latter are species of *Pterocarpus*, which grow to much larger dimensions than the *Eysenhardtia*, and one of these was in all probability the source of the large logs carried to Spain by the Viscayan merchant mentioned by Hernández. Hernández never described a *Pterocarpus* botanically, and in all probability he never saw specimens of their leaves or flowers. As already indicated, none of them has leaves with small leaflets in any way comparable to those of *Cicer arietinum* or of *Ruta chalepensis*.

THE GENUS EYSENHARDTIA

Following is the original description of the genus *Viborquia* of Ortega,¹² with a reproduction of Ortega's original illustration (fig. 1). The name itself, on account of its prior use for another genus by Konrad Moench of Marburg, in 1794, under the form *Viborgia*, had to be abandoned in favor of the much later name *Eysenhardtia* of Humboldt, Bonpland and Kunth, proposed in 1823.¹³

GENERIC CHARACTER

- CALYX** tubular-campanulate, five-toothed at the mouth; teeth equal, obtuse, very small, the two upper ones more remote, broader, and a little deeper.
- COROLLA** papilionaceous. *Vexillum* cuneiform, emarginate, carinate, with the margins involute. *Wings* longer than the keel, spathulate, falcate, within concave above. *Keel* two-petaled, spathulate, falcate, within concave above.
- STAMENS** ten. *Filaments* shorter than the corolla, united into a cylinder cleft above. *Anthers* subrotund, incumbent, bifid at the base.
- PISTIL** with the *ovary* oblong compressed. *Style* subulate, ascending, a little longer than the stamens. *Stigma* capitate.
- LEGUME** oblong, compressed flat, subfalcate, containing the seed at the apex.
- SEED** oblong-reniform, affixed to the apex of the legume.

DIFFERENTIAL CHARACTER

- CALYX** 5-toothed, the two upper teeth the broader. *Corolla* composed of 5 petals: *vexillum* cuneiform, the remaining petals spathulate. *Legume* sessile, foliaceous, 1-seeded, containing the seed at its apex.

¹² Hort. Matr. Dec. 5: 66. 1798.

¹³ Nov. Gen. et Sp. 6: 489. 1823.



Fig. 1. *Eysenhardtia polystachya* (Ortega) Sargent. A copy of Ortega's original illustration, with details of flower and fruit.

DESCRIPTION OF EYSENHARDTIA POLYSTACHYA

The plant positively identified as yielding the lignum nephriticum of Hernández may be described briefly as follows:

Eysenhardtia polystachya (Ortega) Sargent, *Silv. N. Am.* 3: 29. 1892 (excl. Texas references).

Viborquia polystachya Ortega, *Hort. Matr. Dec.* 5: 66, *pl.* 9. 1798.

Eysenhardtia amorphoides H.B.K. *Nov. Gen. et Sp.* 6: 491, *pl.* 592. 1823.

Varennea polystachya DC. *Prodr.* 2: 522. 1825; Oliva, *Lecc. Farm.* 2: 429. 1854.

An erect, sweetly aromatic shrub or small tree, glandular-punctate, with spreading, recurved branches. Leaves even-pinnate or odd-pinnate, with numerous small opposite or alternate stipellate leaflets, these oval or oblong-elliptical, entire, usually decreasing in size toward the extremity of the rachis, the terminal one of odd-pinnate leaves usually obovate, the others rounded or slightly retuse at the apex and often terminating in a short acumen, pubescent when young, often becoming glabrate, usually punctate with glandular dots on the lower surface; rachis grooved above, irregularly glandular-dotted, often retaining the persistent minute subulate stipels after the leaflets have fallen. Flowers fragrant, small, white, turning yellow in drying, borne in terminal densely spicate racemes; pedicels subtended by a lanceolate deciduous bracteole, short and slender, often reflexed at length, but sometimes ascending or widely spreading; calyx glandular-punctate, 5-toothed, persistent; corolla scarcely at all papilionaceous, composed of 5 nearly equal unguiculate petals, the standard slightly broader than the wings and keel, emarginate, carinate, with involute margins; stamens 10, diadelphous, the superior one free, the filaments of the others united into a tube; ovary sessile, oblong, compressed, terminating in a long slender style, somewhat longer than the stamens, geniculate and glandular below the apex; stigmas introrse. Legume small, oblong, compressed flat, subfalcate or almost straight, subtended by the persistent companulate calyx and tipped by the persistent base of the style, usually glandular-punctate, indehiscent, pendent or abruptly reflexed, sometimes widely spreading or ascending but never erect and appressed, purplish at the apex when fresh, usually containing a single seed near the apex.

This species was first described by Gómez Ortega, under the name *Viborquia polystachya* in 1798, as shown in the synonymy given above, from specimens grown in the Royal Garden of Madrid from seeds sent by Sessé from Mexico. Ortega named the genus in honor of "Viborq, most distinguished professor of the botanical garden of Copenhagen, who, when a short time ago he journeyed through Spain and visited Madrid, left in us deep appreciation of his kindness and his conversation." The generic name *Viborquia* had to be aban-



Fig. 2. *Eysenhardtia polystachya* (Ortega) Sargent. A Tamaulipas specimen, showing reflexed legumes and cross-section of the trunk (lignum nephriticum). Natural size.

done for the reason given above, and that of *Eysenhardtia* H.B.K. substituted for it.

The general range of the genus *Eysenhardtia* is from Guatemala to Texas and Arizona. On account of their great variability it is difficult to delimit the species. It is quite certain, however, that the low shrubby *Eysenhardtia texana* Scheele, with erect appressed falcate seed-pods, the type of which was collected by Lindheimer in the vicinity of New Braunfels, Texas, is a valid species quite distinct from *E. polystachya* of central and southern Mexico, which often attains the size of a tree; and it is quite probable that the more robust *E. adenostylis* Baillon, of Guatemala, is also a valid species. On the other hand *E. orthocarpa* Watson, of western Texas and southern Arizona, approaches so closely to forms of *E. polystachya* collected in the Valley of Mexico, Jalisco, and Michoacán, that it may prove to be specifically identical with them. A critical study of the genus *Eysenhardtia* is greatly to be desired. The group of low scrubby plants including *Eysenhardtia spinosa* Engelm., *E. parvifolia* Brandeg., and *E. peninsularis* Brandeg., is so distinct from typical *Eysenhardtia* that it is quite possible it may have to be removed from this genus.

Eysenhardtia polystachya, as understood by the author, is remarkably variable in size and form of leaves, density of pubescence, and appearance of seed pods. It sometimes occurs as a stunted bush with very small leaflets, sometimes as a spreading shrub with straight stems, and sometimes as a slender tree 5 to 7 meters high, the wood of which is prized by cabinet makers on account of its hardness, durability, and fine, dense, straight grain. In the vicinity of Mexico City on the pedregales, or lava beds, sometimes called the *malpais*, a form with small pubescent leaves is the most prevalent. In the northern Mexican states it occurs on elevated dry plateaus in the form of shrubs about 2 meters high with relatively small leaflets. A distinction has been made between the forms having reflexed pedicels and those with ascending or spreading pedicels; but in the barrancas of Jalisco forms very closely allied are found almost side by side, some with mature pods reflexed, and others with them ascending but never closely appressed as in *E. texana*. In this region also there are subglabrous forms with seed pods at least twice as large as those of the type.

In addition to the localities mentioned, specimens of *Eysenhardtia polystachya*, or of forms so closely allied to it as to be scarcely distinguishable, have been collected on the volcanoes of Colima, near the Pacific coast of Mexico, and Orizaba, near the Gulf coast; on the high water-shed between Chilapa and Tixtla, in the State of Guerrero; in

the State of Oaxaca at elevations of 1500 to 1800 meters, especially on the slopes of barrancas or canyons; and in northeastern Michoacán, where the trees are large enough to yield valuable cabinet wood. A specimen in the U. S. National Herbarium collected at the station of La Junta, Michoacán, by Langlassé (no. 226) is described by the collector as "arbre au tronc élancé; bois, recherché pour ébénisterie, prouduit une teinture bleue." The specimens in the Economic Herbarium of the U. S. Department of Agriculture, including the wood with fluorescent properties, described in the present paper, were collected in north-central Tamaulipas, not far from the village of San Nicolás. They are shown in figure 2.

DENDROLOGICAL NOTES

Microscopic sections of the wood of *Eysenhardtia polystachya* were made at the writer's request, by Dr. Albert Mann, Plant Morphologist of the Bureau of Plant Industry, and by Mr. C. D. Mell, Assistant Dendrologist of the Forest Service. Dr. Mann found the heartwood to be extremely compact, heavily lignified, and impregnated with a gum, or resinoid substance, which did not break down in xylol. This gum is contained in tracheae, which in cross sections appear like pores, either solitary or in groups of two or three. Radial and tangential sections show the tubes, with pitted walls, to be partly or entirely filled with this gum, and they also show the medullary or pith rays, which in the cross-sections are inconspicuous. The annular lines of growth, however, are well marked in the cross sections.

Specimens of Philippine lignum nephriticum (*Pterocarpus indicus*) commercially known as *narra*, from Baggao, province of Cagayan, Island of Luzon, were obtained by the writer from the newly installed wood-collection in the U. S. National Museum. This wood bears little resemblance to that of *Eysenhardtia*. In the specimens obtained the color was a beautiful deep flesh tint variegated with light red; the grain coarse and somewhat twisted; and the annular lines of growth, as seen in the cross-section, very distinct, with conspicuous large pores between them. Chips of this wood in tap water yielded a yellow infusion of a lighter shade than that of *Eysenhardtia polystachya* but reflecting a very similar blue fluorescence.

SUMMARY

Lignum nephriticum mexicanum, a wood remarkable for the blue fluorescence of its infusion in spring water, was celebrated throughout Europe in the 16th century as a diuretic. Its botanical identity has remained uncertain until the present time.

It proves to be the wood of a leguminous tree, *Eysenhardtia polystachya* occupying an extensive range in the interior of Mexico. The botanical description of the tree corresponds well with that of Hernández written in the 16th century. Its pinnately compound leaves bear a general resemblance to those of *Cicer arietinum* and also suggest the divided leaves of *Ruta chalepensis*. Its small flowers, arranged in spicate clusters, though white when fresh, soon turn yellow in dried specimens. Its wood, straight-grained and dense and free from knots, yields a tincture in spring-water (containing a slight percentage of lime) which shows a remarkable blue fluorescence and in an opaque vessel appears quite blue.

Its botanical identity remained uncertain for so long a time owing to the following causes; (1) Commercial specimens of the wood were unaccompanied by botanical material; (2) botanical material in herbaria was lacking in wood; (3) the phenomenon of fluorescence as seen in ordinary daylight is produced by an infusion of the dark-colored heartwood, while the light-colored sapwood of stems and of moderate-sized branches, though yielding a fluorescent infusion as seen in ultra-violet rays, does not yield a fluorescence perceptible in daylight; (4) the plant was first described from a shrub in all probability too young to possess heartwood, and the author of the species was unaware of its identity with *lignum nephriticum* or even of its power to produce the phenomenon of fluorescence.

For the first time the botanical identity of the true *lignum nephriticum mexicanum* has been established beyond a doubt, by the study and exhibition of specimens of wood corresponding accurately with the descriptions of Robert Boyle, yielding the characteristic fluorescence obtained by him in his experiments, and accompanied by botanical specimens from the tree producing the wood, these agreeing in all respects with the original description by Hernández of the plant yielding *lignum nephriticum*.