

A TREATISE
ON
Pilocarpus (Jaborandi).

The Therapeutic Uses are written for this Treatise by Professor HERBERT T. WEBSTER, M. D., Author of Principles of Medicine, Dynamical Therapeutics, and The New Eclectic Medical Practice. Formerly Professor of Materia Medica and Therapeutics, and again of the Principles and Practice of Medicine, California Eclectic Medical College.

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The Illustrations are drawn by Mr. W. F. HAMMER.

The Description, History, Chemistry and Pharmaceutical record are by JOHN URI LLOYD.

Treatise No. I embraces Thuja Occidentalis and Cratægus.

Treatise No. II embraces Cactus Grandiflorus.

Treatise No. IV will embrace Veratrum Viride.

Drug Treatise, Number III.

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PILOCARPUS.

(JABORANDI.)

Part Used.—"The leaflets of *Pilocarpus selloanus*, Engler (Rio Janeiro Jaborandi), and of *Pilocarpus Jaborandi*, Holmes (Pernambuco Jaborandi)."—U. S. P., 1890. The Pharmacopœia, 1900, will recognize only *Pilocarpus microphyllus*, Stapf.

Name.—The name Jaborandi is given in South America to a number of shrubs belonging to the Rutaceæ and Piperaceæ, the leaves of many of which are exported under the common term, Jaborandi. Hence, this name, "Jaborandi," should be either abandoned in medicine, or confined exclusively to the official (1900) species, *Pilocarpus Microphyllus*.

History.—About 1854, Lemaire described *Pilocarpus Pennatifolius*, then of botanical interest only. In 1874, Dr. Coutinho, a Brazilian physician, carried the leaflets to Paris, and the drug soon attracted attention as a sialogogue (Fig. 8). Orders were now sent to South America from both Europe and America for "Jaborandi," and as a result, because of the indiscriminate use of the term, the leaves of many shrubs came back. Some of these were true to the species desired, others were varieties of the authentic species, and others still were sophistications, admixtures and substitutes. Probably in no instance connected with a botanical specimen have we a record of such gross imposition, such deliberate substitution, such careless attention in collecting and distributing as then prevailed and still prevails in the case of *Jaborandi*. Since that date (1875), this drug has presented the most exasperating problem that has confronted the careful selector of crude drug materials. The name *Jaborandi*, which meant nothing definite twenty-five years ago, means no more to-day. Under that term drugs true to name, varieties of the official species, sophistications and admixtures still hold the market, one especially (see Fig. 9) being actually harmful in character. In this connection it may be stated that our recent attempt to procure in America a lot of prime pilocarpus resulted in but one offer on guarantee, and that drug (not the desired species) assayed us by accepted standard less than one-fourth strength. One hundred pounds of the officinal species (U. S. P., 1890) worked a short time since yielded less than twenty pints of *Specific Medicine Jaborandi*. The day this is written not one bale of true *Pilocarpus microphyllus* can be found in our market, although an abundance of "Jaborandi," of other species, is to be obtained.

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Names and Varieties.—In commerce the meaningless terms Pernambuco Jaborandi, Paraguay Jaborandi, Maranham or small Jaborandi, Ceari Jaborandi, Aracati Jaborandi, Rio Janeiro Jaborandi, and other names prevail, all relating to either the country where the drug is grown, the part of South America that exports it, or to the common term applied by the people. It may be confidently stated that unless one is versed in botany and pharmacology, and indeed is experienced in the special field of the drug known as "Jaborandi," he may expect to meet with gross imposition if he ventures to purchase the crude drug under any of these titles or by the common name "Jaborandi."* Nor is this necessarily due to intent of either importer or jobber, for, in general, each dealer in this foreign drug is helpless in the face of confronting conditions that, as with collectors at a distance, lie entirely beyond control. Mr. E. M. Holmes, the best European authority (see also Index Kewensis), states that the following species and varieties were known, under the name of *Jaborandi*, as early as 1895. Since which date two other species have been added.†

LEAVES SIMPLE.	LEAVES COMPOUND, IMPARIPINNATE.
<i>Pilocarpus</i> spicatus,	<i>Pilocarpus</i> goudutianus,
" subcoriaceus,	" heterophyllus,
" longiracemosus,	" trachylophus,
" pauciflorus,	" pennatifolius,
" latifolius,	" selloanus,
" guianensis,	" jaborandi,
" humboldtii,	" microphyllus,
" racemosus,	" grandiflorus,
" riedelianus,	" macrocarpus.
" giganteus.	

Let us now supplement these general remarks by more specific descriptions.

GENERAL CHARACTERISTICS OF THE SPECIES OF *PILOCARPUS* (JABORANDI).‡

As found in commerce the leaflets are much broken and usually detached from their rachis. They are unequally pinnate, the midrib dividing the terminal leaflet into approximately equal halves. The

*In our opinion the American authority most accomplished in "Jaborandi" problems from the botanical side is Professor H. H. Rusby, M. D., of New York City. His recent paper, presented to the American Pharmaceutical Association and published in the Bulletin of Pharmacy, October, 1908, is invaluable.

†British Pharm. Journ. and Trans., 1895.

‡Again we refer to the admirable treatise by Professor Rusby, which has been freely consulted in this part of our study. The illustrations are all, excepting Fig. 9, made from natural leaves and drawn by Mr. W. F. Hammer.

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lateral leaflets are oblique, that is, narrower on one side of the midrib, the two sections being of unequal shape by reason of the portion on the upper side of the midrib being the shorter. (See Fig. 6.)

The base of the leaflet may be *rounded* (Fig. 1), *acute* (Fig. 2),



Fig. 1—ROUNDED BASE.

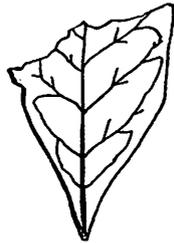


Fig. 2.—ACUTE BASE.

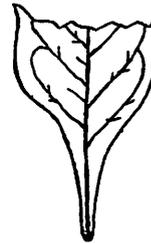


Fig. 3.—TAPERING BASE.

or *tapering* (Fig. 3). In referring to our illustration of the entire leaf, *Pilocarpus Microphyllus* (Fig. 6), it will be observed that the terminal leaflet is tapering, the base leaflets rounded, while those between them become progressively acute from the base upward. This characteristic we have noticed with all the specimens we have studied and indicates why the shattered drug thus varies.



Fig. 4. Fig. 5.
SHOWING EMARGINATE SUMMITS.

The summits of the leaflets of all the species of *Pilocarpus* are almost invariably *emarginate* (Figs. 4 and 5). If the leaflet be held between the eye and a strong light, especially if a magnifying glass be used, *transparent dots* (like pin points) are to be observed (see Fig. 11). These two characteristics (emarginate summits and pin-point dots) distinguish the *Jaborandis* from other species of shrubs observed as sophisticants. But they neither identify the valuable species of *Jaborandi*, nor indicate therapeutic qualities. Utterly worthless varieties conform to these descriptions. Even the dissimilar *Pilocarpus trachylophus* (Holmes) (see Fig. 9), the most abundant drug of the market, and "worse than useless" (Rusby), presents the general features of these descriptions, not excepting the transparent dots. The man who selects *Jaborandi*, intelligently, must draw yet closer lines. *But one species should be used*, and he must *know* that species. At the outside, *but one of the many related varieties can be tolerated*, and that only in emergency cases. (See Fig. 7.)

Pilocarpus microphyllus (Stapf).—*The Best Species*.—And, as has been stated, the only "Jaborandi" to be officinal in the forthcoming Pharmacopœia of the United States is *Pilocarpus micro-*

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phyllus, Stapf. It is the *small leaved* Jaborandi, called in commerce *Maranhã* Jaborandi, which term (*Maranhã*), however, indicates only the name of the South American point of export. The fact is, we do not know where this species of Jaborandi is gathered. It comes to market from the interior of South America, and that statement covers our knowledge concerning its habitat.

Description.—The leaflets are unequal, oval to obovate, from one-half to one and one-half inches long, and about half as wide. The midrib is heavy, the veins coarse. The terminal leaflets are equally ovate to obovate, have a more tapering base than the lateral leaflets, and are narrower. Immature, paper-like, green leaves, as well as brown, over-ripe and partly decayed leaves are to be avoided. In many instances the curing process is defective, the central parts of the bales being mouldy, or injured through moisture. This is true, however, of all other varieties. The prime drug is firm in texture, the veins and pin-points distinct, the color green, but not too deep, the odor herby. The taste, slightly aromatic, passes into a touch of saline (Nitrate of Potassium, see p. 8) followed by bitterness upon prolonged chewing.

Sophisticants.—Aside from the inferior or harmful Jarborandis, the leaflets of a species of *Swartzia* is on the market. This is an absolute fraud, bearing a fairly close resemblance to Jaborandi, suf-

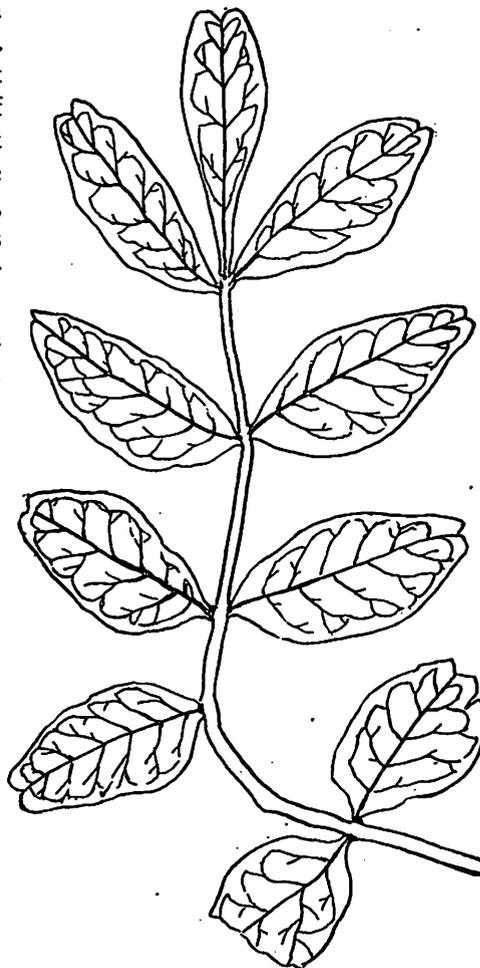


Fig. 6—*PILOCARPUS MICROPHYLLUS* (Stapf).
[True Jaborandi—U. S. P., 1890.]
Natural Size.

Drawn from the leaf by Mr. W. F. Hammer.

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ficient, possibly, to deceive the unwary, the willing, or the inexperienced, but lacking both the *leaf dots* and the *emarginate* apex.

Pilocarpus Jaborandi (Holmes) is the next in importance. In fact, it is the only other variety to be sanctioned at all. It is in marked contrast to the foregoing, in that it is the *stiffest* and heaviest of all the Jaborandis. It is from two to five inches long, yellowish-green, smooth, stiff, almost like card-board to the touch, very prominently and and reticulately venated (Fig. 7).

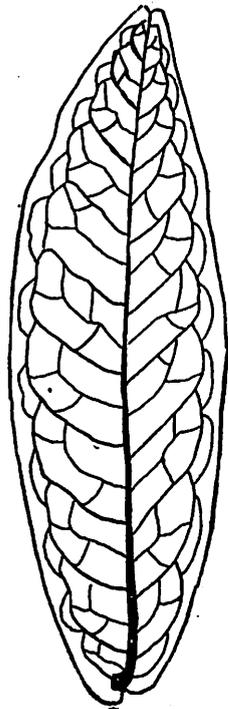


Fig. 7 Pilocarpus JABORANDI (Holmes).
Natural Size.

Drawn from the leaf by Mr. W. F. Hammer. This species occurs twice the size of this specimen, the drug varying much. It is the only permissible substitute for Pilocarpus Microphyllus.

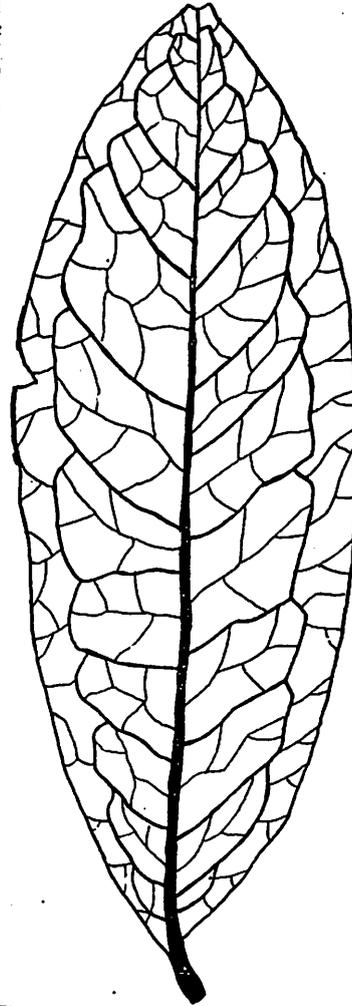


Fig. 8—Pilocarpus PINNATIFOLIUS (Lem).
Natural Size.
Drawn from the leaf by Mr. W. F. Hammer.

Sophisticants.—So-called Rio and Paraguay leaves (included in the terms *Pilocarpus selloanus*, Engler) are sold for this species. The Rio is very poor, the Paraguay more so, neither being stiff and brittle to the touch. Neither species should be employed in medi-

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cine, and yet both are found in market in abundance. Drawings Nos. 7 and 8 are much alike, but the leaves differ materially in texture and surface appearance, the most characteristic distinction perhaps being the stem base, as shown by our artist. *Other Sophisticants and Substitutes* or at the best *Poor Varieties* may be named as follows:

Pilocarpus Trachylophus (Holmes), known as Ceara, is an off shade, dark, narrow leaved variety, about half as long as the *Pilocarpus Jaborandi* (Holmes) (Fig. 7). The dried leaves are thick in texture,



Fig. 9.—**PILOCARPUS TRACHYLOPHUS** (Holmes) "Ceara." (Natural Size.)
Drawn from the leaf by Mr. W. F. Hammer. A dangerous substitute for true jaborandi.

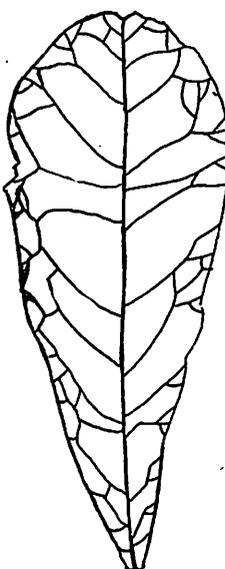


Fig. 10.—**PILOCARPUS SPICATUS** (St. Hil.) (Natural Size.)
Drawn from the leaf by Mr. W. F. Hammer. The rounded summit, shown in drawing, is often more acute.

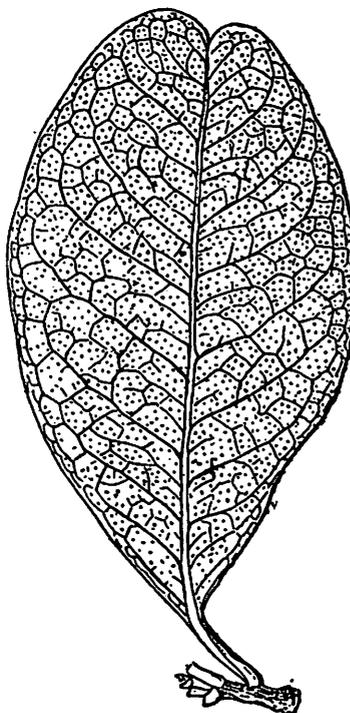


Fig. 11.—**PILOCARPUS RACEMOSUS** [Naudeloupe Jaborandi.] (Natural Size.)
Pharm. Journ., London, Nov. 14, 1903.

much doubled, the edges much folded, reminding both in dark color and in their creased appearance of eriodyction leaves. This is a dangerous substitute, because of dissimilar qualities (Rusby), and yet is very widely sold on the market. Indeed, *it is the most abundant variety*. **Pilocarpus spicatus** (St. Hil.) (Aracati Jaborandi) (Fig. 10), a brown stemmed, coarse drug, disagreeable in odor and taste, is also to be avoided. Mixtures of similar leaves, of dissimilar leaves, and of yet other varieties of *Pilocarpus*, confront men concerned in commerce and in medicine making, but for de-

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scriptions in detail, space is herein lacking. The accompanying Fig. 11, just thrown on the London market and described by E. M. Holmes in the Pharm. Journal, London, Nov. 14, 1903, as Guadeloupe Jaborandi is probably (Holmes) *Pilocarpus racemosus*. It affords the alkaloids found in the official species.

To this it must be added that even though Jaborandi be true to name it is not necessarily of fitting quality. A specimen of *Pilocarpus microphyllus* from five bales, now before the writer, is badly cured and inferior. Another specimen of five bales is much mixed with trash and stems. Yet other specimens grade from indifferent to prime.

Constituents.—As might be expected the chemistry of "Jaborandi" is in a chaotic condition. The one conspicuous product is the alkaloid *pilocarpine* (discovered independently, 1875, by E. Hardy, in France, and A. W. Gerrard, in England), but this is one constituent only, for a number of fortifying or modifying acids and basis are to be obtained from, or are present in the plant. Practitioners of medicine know from experience that a preparation of true *Pilocarpus microphyllus* carries qualities distinct from those of the alkaloid which, in itself, as found in commerce, is not necessarily a uniform agent, and, as is shown by the melting points, as well as by observation of the substances obtained under the name *pilocarpine* from different species of plants, must be taken with much discriminative allowance. A qualified student of *Materia Medica* can distinguish the official leaf and fairly judge of its condition (no pharmacist need ask an excuse for not knowing the true drug), but yet few can draw alkaloidal distinctions between the alkaloidal products of the various species, which, indeed, remain yet to be studied. The most abundant spurious drug (*Pilocarpus Trachylophus*) yields an alkaloid that is worse than useless, because it is *antagonistic* to the principal alkaloid of the official leaf, few being familiar with its chemical distinctions. The so-called active principles of the Jaborandis embrace the alkaloids *jaborine*, *pilocarpidine*, *jaboridine*, *jaborine*, and the acids *jaboric* and *pilocarpic*, as well as other products and educts, among which is potassium nitrate, obtained by us in crystals. The chemistry of these Jaborandi bodies is enough, almost, to take the life study of a specialist, and the distinctions and relationships of these products in natural association, or as separate products, are not less an enigma than are the structures themselves.

The complications to be found with Jaborandi, 1st, in the botanical source, 2nd, pharmacology and histology of the drug, 3rd, its chemistry, and its uncertain educts, indicates that an established pharmaceutical preparation made of the true species, worked by a

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process that results in a uniform product, by a system of determinations supported by the clinical experience of practitioners, serves best and most surely the practitioner. This we believe, basing our opinion on our experience in selecting the drug, in working it, and on the reports that come to us from physicians who employ our preparation of *Pilocarpus microphyllus*. On the use of such a preparation has the value of the drug been established by the physicians contributing the therapy of Jaborandi to this article, and not on any fractional alkaloidal educt, or preparation of a related species.

PHARMACEUTICAL PREPARATIONS.

Fluid Extract. The Pharmacopœia of the United States (1890) gives a formula for a fluid extract, which may be made of either the leaflets of *Pilocarpus selloanus*, Engle, or of *Pilocarpus jaborandi*, Holmes. In fact, however, the commercial fluid extract is probably largely made of the mixed commercial varieties of the drug, for large amounts of these are sold, and the fluid extract is the only pharmaceutical preparation employed to any extent outside the Eclectic and Homœopathic professions. It is a dark, red-brown or greenish liquid, much given to precipitation, and possibly to structural alteration as well as to the observed physical change. Its taste is herby, insipid, leaving a slight bitterish after-taste.

Specific Medicine. This preparation, the favorite of Eclectic physicians, is, in our opinion, the choicest of the preparations of Jaborandi. It is invariably made from the select small leaf species (*Pilocarpus microphyllus*), and is of an exactness that results from a long continued special study of the drug manipulated in large amounts. It has a deep green color,* an herby odor and taste, leaving a decided after-taste that is characteristic of the drug. When dropped into water, it makes a greenish, opalescent solution which does not precipitate to any great extent, if at all. We supply it when we can get the prime authentic drug to work, otherwise we decline to furnish the Specific Medicine.

Summary. This study presents but a touch of the Jaborandi problem. It is not intended to do more than identify the true drug, point to its sophisticants, and comprehensively indicate the perplexing conditions that involve those concerned in supplying to

* We consider this coloring matter of no medicinal value.

NOTE.—For Historical treatises on "Jaborandi," see papers of E. M. Holmes, London, in *British Pharmaceutical Journal*, 1895. For Botanical and Commercial studies, see paper by Professor H. H. Rusby, M. D., New York, *Am. Phar. Assoc.*, 1908. For "Constitution of Pilocarpine," see work of H. A. D. Jowett, D. Sc., *Welcome Research Laboratory, London*, Frederic Power, Ph. D., Director. These, in addition to a multitude of treatises in all languages, are to be found in the Lloyd Library, and are at the service of the public.

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physicians authentic preparations of this drug, which, if the drug be true to name, are, as both Dr. Webster and Dr. Foltz state, invaluable, but which from false species or spurious alkaloids may not only be useless, but positively harmful. Uncertainties of market conditions, both concerning species and quality, have often tempted us to cut the name of Jaborandi from our medicine list.

THE THERAPEUTICS OF JABORANDI

(With Classified Uses from Dynamical Therapeutics).

BY PROFESSOR HERBERT T. WEBSTER, M. D.

General Remarks.—Few drugs can serve as many different purposes through modification of dose as Specific Jaborandi; and, I may add, in my opinion, few are so susceptible to loss of quality by pharmaceutical manipulation. I have tried various samples of the remedy from numerous drug houses within past years, but have never been fully satisfied with any preparation other than Lloyd's Specific Medicine. Other reliable fluid preparations of this agent may exist, but I have never found them. The remarks I shall offer here, therefore, are predicted upon my experience with the Specific Medicine.

In full doses, Jaborandi is the remedy of all others for establishing a favorable crisis in severe forms of acute disease. In inflammatory rheumatism, in pernicious malarial fever of different forms, in the wild delirium of typhoid fever, and in the intense pain of acute pleuritis, a drachm dose of this drug will often bring the disease to a favorable termination within an hour or two, when ordinarily we would not expect drugs to accomplish anything at all, unless from extended use. Sometimes the stomach will not tolerate the drug, and sometimes absorption may not go on properly, as in bad cases of congestive chill, and we then employ a corresponding dose of pilocarpine hypodermatically; but where it can be administered by mouth, specific Jaborandi is the remedy *par excellence*. Profuse perspiration does not always attend its action, but it equalizes the circulation, relieves internal organs of congestion, and promotes an even distribution of capillary blood, thus, often, disposing of urgent and dangerous symptoms.

In my work on the Practice of Medicine (Vol. I, 1899) I call attention to the speedy influence of this drug, in full doses, in the comatose, delirious, and colliquative forms of pernicious intermittent fever. My experience in past years has warranted all I have there written; and, since the publication of that work, several of our

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physicians have testified to the efficacy of such treatment by publishing articles of similar tone (Drs. Kinnett and Wolf, in Transactions N. E. M. A.). Dr. Wolf applies the principle to typhoid fever, and relates surprising effects in some cases of dangerous delirium in that disease, where a single drachm dose of Jaborandi nearly established convalescence in a few hours and permanently banished the delirium. We probably possess no other remedy so capable as this of establishing a permanent and favorable crisis in severe febrile diseases where a fatal issue seems imminent.

In smaller doses, Jaborandi is one of our most reliable remedies of the class designated by Prof. Scudder as "special sedatives." Attention to this property was first called in my Principles of Medicine, published in 1891. Since that time the drug has become a prime favorite with many of our school for lessening rapidity of the pulse, reducing the temperature, and calming the erethism of various febrile and inflammatory diseases. It has few rivals and no superior among this class of agents. It should be preferred to aconite in all sthenic cases of the kind, and is not objectionable in asthenic cases, if the dose be properly regulated. It possesses the salutary property of imparting a cooling sensation to the skin during its action, which is very grateful to patients suffering with pyrexia. It also relieves headache arising therefrom, calms nervous irritability, and soothes local inflammatory action. In addition to its applicability in idiopathic forms of fever, it is excellent in many forms of symptomatic fever, such, for example, as pneumonia, erysipelas, and acute rheumatism. In pneumonia it does well either alone, or in combination with *asclepias tuberosa*; in rheumatism, especially the inflammatory form (acute articular), it is a favorite agent in combination with *Rhamnus californica*. In erysipelas, *echinacea* is a good companion remedy, though the specific properties of Jaborandi are sufficient to recommend it as a specific agent in this as well as in kindred complaints.

Jaborandi possesses minor properties which also recommend it. While I have called attention to its everyday uses by the general practitioner, we must not forget its specific action on the parotid gland, which commends it in parotitis, in ptyalism, in suppression of milk, due to a specific action on the mammary gland, in colliquative sweating; also as a hair tonic, taken both internally and applied locally. The uses of pilocarpine by oculists and aurists are not legitimately within the confines of this article.*

Another property highly prized in some quarters is the action of Jaborandi in rigid os uteri. Here it ought to be given in full doses, say thirty drops in water, repeated once or twice, if necessary.

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Besides its action on the skin, parotid and mammary glands, and hair follicles, Jaborandi also specifically influences the throat, and it has been recommended as a safe and sure remedy for stubborn throat affections (pharyngitis diphtheria and membranous croup). Several years ago Dr. K. O. Foltz recommended it as a specific for minister's sore throat. My experience tends to confirm this statement, though the action is not as positive as in some other directions. I have derived splendid results from it in a few cases of stubborn aphthæ, attended by ptyalism.

On the Circulatory System.—In minute doses Jaborandi relieves irritability of the heart and blood-vessels, and tends to induce a normal equilibrium of the general circulation when this has been disturbed by febrile action. In large doses it produces profuse perspiration, coldness of the surface, ptyalism, vomiting and sinking sensation; carried further it may cause complete diastolic arrest of the heart's action.

Under judicious dosage it is our most valuable arterial sedative, promptly controlling febrile action, lowering the temperature, and promoting normal secretion from the skin, lungs and kidneys, while the circulation is equalized and an agreeable sensation of coolness and comfort imparted to the general cutaneous surface. It is thus valuable in all forms of fever not marked by great adynamia, and in inflammatory conditions its general effect is attended by amelioration of the local hyperæmia of highly satisfactory character. We probably do not possess another as valuable agent in inflammation attended by sthenic conditions as this in our entire materia medica.

In inflammatory rheumatism, from the most active forms, where the tissues are swollen to fullness of the skin, and the pain is excruciating, to more passive forms, where joints are swollen and stiff, but not exceedingly painful, there is nothing in the materia medica like it for promptness of action in relieving the local symptoms. Under its influence, though here a few full doses may be needed, the most severe pain subsides, and swelling and redness are soon gone—not that there need be redness to indicate it, for many of these cases may be so sub-acute as to be pale and painless, though the joint may be swollen and stiff. Some of these patients may be able to attend to their daily vocations, though complaining of swelling, soreness and stiffness in the joints. I find Jaborandi to be the best prescription here.

Jaborandi has other valuable uses which will be noticed in their proper order.

Dose.—Where prompt action is desired to relieve severe pain, from fifteen to thirty drops of the Specific Medicine may be given at a dose, and repeated in half an hour if necessary, though I would not recommend the repetition usually within the hour. As a febrifuge and antithermic—sedative to the arterial system—I would add from one to four drachms of Specific Medicine to four ounces of water and administer a teaspoonful every hour.

On the Digestive Organs.—Jaborandi specifically influences the salivary glands and mucous membrane of the mouth and fauces. It is useful to arrest ptyalism and stomatatis, especially the aphthous form.

I have cured aphthæ complicated with profuse ptyalism promptly with Jaborandi, after several other remedies had failed.

Dose.—Add ten drops of the Specific Medicine to four ounces of water and give a teaspoonful every two hours.

*See special contribution of Professor Kent O. Foltz, M. D., pp. 14 to 16.

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On the Respiratory Organs.—Jaborandi controls excitement of the general circulation, in appropriate doses, and thus becomes a valuable remedy in all cases of acute inflammation of the respiratory organs.

It is of service in the early stages of bronchitis, combined or alternated with elecampane, potassium bichromate, bryonia, aconite, etc. In pneumonia, it combines or alternates well with asclepias, in the early stage, and with potassium chloride, during the stage of exudation. Administered with caution, it is one of the best sedatives we possess in all inflammatory conditions of the respiratory organs in their active stages.

Dose.—One to five drops of the Specific Medicine, every one or two hours.

On the Urinary Organs.—Jaborandi is sometimes useful in diabetes insipidus, combined with ergot, to arrest the excessive discharge of water. It is also useful in the albuminuria of pregnancy, used in doses sufficiently large to stimulate sweating, which should be kept up profusely until time for the effect to become beneficial has elapsed.

Jaborandi has been employed in some quarters in the advanced stage of Bright's disease to produce a vicarious action of the skin and relieve the system of the effects of retained urinary elements through the sudoriparous glands. Such treatment must however be temporary in result.

Dose.—To produce free diaphoresis, ten drops of the Specific Medicine, repeated every one or two hours. Larger doses, if they are to be repeated for any great length of time, should be used with caution and watchfulness. From the fraction of a drop to five drops may be employed in the treatment of diabetes.

On the Muscles.—I think that we possess one of the most positive remedies for muscular pain in Jaborandi that the materia medica contains. Especially adapted to acute forms of muscular pain, and sometimes acts admirably in chronic cases.

One of the positive indications for the administration of Jaborandi in muscular pain is that of *puffiness* of the surrounding tissues. In inflammatory rheumatism, where the parts involved are swollen and painful, whether reddened or not, Jaborandi is *the* remedy of all others.

In severe muscular spasm, where the suffering is intense, a full dose of this remedy will often relieve promptly; if it fail, a repetition of the dose within an hour will alleviate materially and prepare the way for the use of the remedy in smaller doses. If two or three drachms now be added to four ounces of water and a teaspoonful of the mixture be given every hour a few hours will suffice to relieve the difficulty, even if it be a severe attack of muscular rheumatism.

In sub-acute attacks of rheumatism, where there is some pain and considerable swelling about the joints, rendering them sore and stiff, Jaborandi in the small doses mentioned will banish the difficulty in a few days, even if it has been standing for months.

I have employed Jaborandi with complete satisfaction in lumbago of severe character after *cimicifuga* had failed to relieve. In all forms of chronic rheumatism, except where there has been organic change, it should be tried as a *dernier resort*.

Severe abdominal pain, pleurodynia, rheumatism of the heart—in fact muscular pain of any character will yield more promptly to Jaborandi than to any other remedy, unless it be antipyrin, antifebrin, phenacetin, or some other of the preparations that are objectionable on account of their debilitating influence. Jaborandi is much safer, though it may also be overdone as to size of dose, and should be used with judgment.

Dose.—Twenty drops of the Specific Medicine is a full dose.

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On the Skin.—The action of Jaborandi in producing profuse perspiration is well known. Sometimes this action is useful in establishing an artificial crisis early in the onset of continued fevers, where it may be aided by the action of a vapor bath. Another action of Jaborandi is its influence in arresting profuse perspiration due to relaxation of the cutaneous vessels. Here the dose must be very small, only a few drops of the Specific Medicine being used in four ounces of water, a teaspoonful of the mixture being given every three or four hours. The dynamical influence here is what is required and care must be observed that the dose be not so large as to cause the drug effect instead.

Dosage.—The drachm dose, for establishing a crisis, has already been suggested. This ought not to be repeated, unless under particularly aggravated circumstances. If the one dose does not succeed, it is doubtful if the second will do so. As a vascular sedative, add two or three drachms of the Specific Medicine to four ounces of water, and give a teaspoonful every half hour or hour. Every half hour is good dosage, until a few doses have been administered, say four or five, then the dose may be given once an hour with good effect. In ptyalism and to relieve profuse diaphoresis the dose may be as small as ten drops to four ounces of water, a teaspoonful every one or two hours. As a galactagogue, ten to fifteen drops should be administered at a dose, three or four times a day. As a specific remedy for the hair the dosage ought to be about the same. It increases the growth of the hair, causing it to grow thicker, and also improves its color. It is said to have turned light hair dark.

PILOCARPUS OR JABORANDI IN EYE, EAR AND THROAT.

BY PROFESSOR KENT O. FOLTZ, M.D.

Pilocarpus possesses a marked influence on the secretory glands, not only of the skin and mucous membranes, but also of all the secreting organs of the body. That certain results will follow the proper administration of a well-made preparation of the true drug is unquestionable; but the number of spurious or inferior quality of leaves sold which are practically inert, will lead to many disappointments. The peculiar alkaloidal principle upon the natural combination of which the remedy largely depends is pilocarpine, but other constituents are undoubtedly of value, as the results obtained from the use of the alkaloid alone are not as satisfactory as from a carefully prepared preparation of a good specimen of the true drug. The alkaloid has its place; the drug has its field.

As Pilocarpus is a favorite of mine, I have tried many preparations in the market sold under the trade name jaborandi, but the majority have been disappointing in their action, and for the last

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twelve years I have used only the Specific Medicine Jaborandi which has given uniformly good results. But, unless the proper indications for the drug are observed, failure will follow.

The general effect noticed in the cases where I administer pilocarpus, is, increased flow of bile, with the accompanying increase of appetite, better digestion, and more or less improvement in the action of the bowels. These results have been observed incidentally in treating diseases of the eye, ear, nose and throat. In a similar manner my attention was called to the relief obtained in a case of dysmenorrhea, which was reported by me in the *Eclectic Medical Journal*. Since the article appeared, 160 reports of cases have been received of its use in this disease and with uniformly good results when of the neuralgic type.

In eye diseases the drug is regularly employed in iridocyclitis (so-called serous iritis), in plastic and traumatic iritis, as the exudate is more rapidly absorbed, and the discomfort of the patient lessened. In rheumatic iritis, it should be given in full doses until the physiological effects are obtained, then keeping just within this action of the drug. In hyalitis, and also in glaucoma simplex good results have been obtained in a number of cases. In optic neuritis, pilocarpus has markedly benefited the majority of cases; if the disease is of syphilitic origin, iodide of potassium should be combined or alternated, giving both in doses to procure their physiological effects. In traumatism of the eye, with effusion of blood into the aqueous or vitreous, there will be a more rapid absorption of the blood by the use of moderate sized doses. In retinal hemorrhages and chorioretinitis, absorption takes place more rapidly, and with less destruction of nerve structure than with any drug I have used. In detachment of the retina, pilocarpus has apparently aided in effecting a re-attachment of the tunic. In nearly all choroidal diseases, through the more rapid absorption of the deposits, the resulting lesions affect visual acuity less than would otherwise occur. In beginning atrophy of the optic nerve, the disease has apparently been controlled. In interstitial keratitis the drug will often materially aid in clearing the corneal tissue. In chronic conjunctivitis, with diminution of secretion, or the character so modified as to produce either a sensation of, or actual, dryness of the conjunctival surfaces, pilocarpus will give good results by increasing glandular activity. Croupous and diphtheritic conjunctivitis will also be favorably influenced by the drug.

In ear diseases the use of pilocarpus is more limited. In dry eczema of the external auditory canal, pilocarpus will often cure by stimulating the secretory glands. In chronic catarrh of the middle

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ear of the sclerosing or dry form, pilocarpus will either materially increase the acuity of hearing or effect a cure, but the treatment must be continued for a long time. In effusion into the labyrinth, the drug will often promote absorption and in many cases, unless syphilitic with sudden loss of hearing, partially restore the hearing.

In atrophic rhinitis and atrophic pharyngitis (pharyngitis sicca) the drug will relieve not only unpleasant dryness but will increase the activity of glands that have not been destroyed.

In laryngitis, when there is lack of secretion through inactivity of the mucous glands, relief is usually prompt.

In tabes dorsalis excellent results have been obtained by the use of pilocarpus in a number of cases.

Dosage.—Each case must be carefully studied, and the remedy intelligently administered. As a general rule the Specific Medicine is given in from 1 to 5 drop doses in chronic cases. In acute cases from 3 to 10 drops at a dose, in a little water, until the physiological effects are obtained, then diminish the dose, just keeping within the physiological action. I have refrained in this paper, excepting in one instance, from suggesting any drug combination, as any indicated remedy may be combined with it.

Indications.—When there is dryness of the tissues or perversion of secretion which is deficient in quantity; atrophy of mucous or submucous structures. Effusion or exudation into serous tissues or cavities. These indications I have found to be effective.

Contra Indications.—Over activity of glands, with profuse watery secretion.

PRICES OF JABORANDI PREPARATIONS.

(We quote only the Specific Medicine, which is the pharmaceutical preparation recommended by the authorities contributing the therapy of this drug. We consider it the most energetic and valuable Jaborandi preparation.)

¼-lb. Package.....	65c. each.	By mail, 87 cents.
½-lb. "	\$1.25 "	Not mailable.
1-lb. "	2.50 "	Not mailable.

January 1, 1904.

LLOYD BROTHERS, Cincinnati, Ohio.