cities of the country, relegated to the bath-houses, but by the aid of a chair, a blanket, and the Schering (formalin) lamp, it can be employed at the residence of any patient. From one to three drachms (4.0–12.0) of calomel, cinnabar, or the gray oxide, or two or more of them in combination, are used for the production of the vapor when placed on the metallic plate of the lamp. Steam is furnished by water boiling in the chamber designed for that purpose, and the naked and sweating skin of the patient wrapped in the blanket and seated over the lamp, is thus subjected two or three times a week to the fumes of the mercury.

The uncleanly, but very effective, method of introducing mercury by inunction is popular abroad, but used in this country chiefly by experts, in hospitals, and at certain Springs enjoying repute for the relief of this disorder. Equal parts of the twenty-per-cent. mercuric oleate and scented vaseline, or the ordinary mercurial ointment, made with lanolin oil, may be used, one drachm (4.0) or more being rubbed at night before retiring into different portions of the skin (selecting a new region each night), and removed by a bath in the morning.

Hypodermatic injections of mercury in various forms are popular upon the continent of Europe, but are much less frequently employed in England and America. They are rapidly effective when used. They have been the subject of much favorable and adverse criticism, and are both praised and decried by leading syphilographers. They are subject to the disadvantage of requiring a physician for the administration of each dose, and are therefore better suited to hospital than to private practice. The following formulæ have been employed: Calomel, gr. iss. to iij. (0.10 to 0.2), rubbed up with about twenty-four minims (1.5) of pure glycerin (Scarenzio); corrosive sublimate, four grains to the ounce (0.266 to 32.0) of distilled water; fifteen minims (1.00) to be injected every two or three days (Lewin). These solutions have been modified by incorporating with them one-tenth of a grain (0.0066) of the acetate or of the sulphate of morphine to relieve pain; and the chloride of sodium, four parts to one of the bichloride, to render the solution less irritating. As these subcutaneous injections are liable to be followed by abscesses, attempts have been made in the direction of securing a soluble albuminate or peptonate of mercury, all of which have proved unsatisfactory. Solutions of the bicyanide, biniodide, nitrate, and formidate of mercury have also been recommended. None of these devices has yet rivalled in popularity the solutions of corrosive sublimate in distilled water.

When mercury produces its happiest effects in syphilis, by any mode of administration, the symptoms diminish or disappear, and the patient actually gains in weight. Even when improperly employed, mercury is not (always) responsible for many of the results popularly ascribed to its influence. These are chiefly syphilitic symptoms of patients misinformed as to the nature of their disorder. The statistics collated by the physicians of the great Russian mercury mines, of disease observed among the workers in the metal, include none of the symptoms popularly ascribed to the influence of this metal in syphilitic patients—mouth-patches, rheumatism, eruptive symptoms, etc. They are all in the direction of salivation, and, in grave cases, of maxillary necrosis. Tenderness of the gums, moderate fetor of the breath, slight increase in the salivary flow, noticeable indentation of the sides of the tongue by the molar teeth, and tumefaction of the mucous membrane—these are the first signs of a toxic effect, which may increase, if the drug be further pushed, to the extreme of complete salivation, with loosening and even falling out of the teeth. In the modern treatment of syphilis no such effects are desired, and are rarely attained. The milder of these manifestations readily disappear under appropriate therapy: tepid gargles of milk, flaxseed tea, or sweetened or demulcent water, containing one drachm (4.0) of potassium chlorate to the pint (500.0) of vehicle; a liquid and nutritious diet; abstinence from iced, alcoholic, spiced, acetous, and hot articles of food and drink; suspension of the mercurial; laxatives sufficient to secure complete evacuation of the bowels; and often the ferruginous and other tonics, preferably in solution.

Iodine and its compounds are useful in combination with mercury and without such union. They are more available for gummatous symptoms, but may be often employed with the greatest advantage in the milder symptoms of the disease. The articles of the class most used are iodine, iodipin, iodoform, and the iodides of lithium, sodium, starch, and potassium. No one of these is equal in value to the iodide of potassium; none enjoys to the same degree the confidence of the profession. It may be given alone or with mercury by the mouth; or it may be given by the mouth when mercury is employed by inunction or fumigation; or it may be given in alternation with one or more of the courses named.

It is always best administered in solution, gr. iij. to xx. (0.20 to 1.33), given in distilled water, milk, or any other vehicle preferred, such as cinnamon water, or one of the various syrups employed as vehicles. The method of administering the iodide of potassium in largest dose, gradually reached, from one drachm to an ounce (4.0 to 32.0) in the twenty-four hours, has been fully described in the paragraphs devoted to nervous syphilis. Employed with all due precautions, and administered with large draughts of pure water, it furnishes one of the most brilliantly effective of the measures at hand in the grave emergencies of the disease. When its morbid effects are produced, these may become apparent after the exhibition of the smaller doses. Among them may be named severe coryza, with œdema of the lids, lips, and glottis; salivation; gastrointestinal distress and tenderness; and a series of cutaneous eruptions. In the order of frequency the latter are acneiform papulo-pustules, furuncular lesions, purpura, tubercles, erythematous macules, bullæ, and eczemaform patches.

An enormous number of medicinal articles, beside those named, have been used in the treatment of syphilis. Some are indispensable in the management of most cases; some have a doubtful effect; many are absolutely worthless. In the first class may be named the ferruginous tonics; the mineral acids (only given simultaneously with the mercuric bichloride); cod-liver oil; quinine and the vegetable bitters; alcohol, judiciously administered; and, in particular, the fluid extract of erythroxylon coca, first warmly recommended by Taylor in the management of syphilis, and fully indorsed by the writer, who has employed it with advantage in many cases. In the second class may be named sarsaparilla (probably having no other than a purely "stomachic" value); the "McDade formula" (equal parts of the fluid extracts of smilax, sarsaparilla, stillingia sylvatica, kappa minor, and phytolacca decandra, with one-half of one part of the tincture of xanthoxylum carolinianum), and Zittman's decoction (probably efficient chiefly for the mercury it contains). In the last class may be named nitric acid, gold, thuya, cascara, berberis aquifolium, and the mass of proprietary preparations, many of which, though advertised as "purely vegetable" compounds, depend for a short-lived popularity upon the mercury or iodine which they contain. None of the mineral springs, in this country or abroad, which enjoy a reputation in the treatment of syphilis supplies a water which can be demonstrated to possess a therapeutic value outside of the climatic, hygienic, and, indeed, medicinal effects obtained by residence and treatment by physicians in the districts where such springs are found. The waters of the well-known Hot Springs of Arkansas, in this country, have never yet been shown to possess any medicinal virtue; and the number of syphilitic patients who annually resort thither and reap some advantage from such a course are, for the most part, those who have been treated there by physicians with mercury or the iodine compounds. The so-called process of "syphilization" has not survived its brief period of notoriety. It was based upon a confusion respecting the nature of the syphilitic and the non-syphilitic sore, and is now a curiosity in the literature of medicine.

No limit can be set to the length of time which should be assigned for the treatment of the disease. The average patient requires careful observation and treatment for from two to four years. Many require this for a far longer period. Mild cases may require less. No guarantee of future immunity can be given any patient on the conclusion of treatment, though probably seventy-five per cent. of all the infected have no symptoms of returning disease after proper treatment by a competent physician. Two years of immunity from all symptoms should elapse after the conclusion of treatment, before a patient of either sex should be permitted marriage with a non-infected person, though in the case of women who have not reached the menopause and are regularly menstruating, this period may be somewhat shortened. Two years of immunity is required by some of the larger insurance companies before accepting life-risks of the infected. Syphilis, however, is, as a matter of fact, one of the most readily managed and promising of all diseases that affect the human race. As distinguished from them all, its prognosis in general may be pronounced good. It may often disfigure, but it rarely destroys, its victims. As against the frequent fatality in pneumonia, variola, typhoid fever, or erysipelas, its statistics include an overwhelming preponderance of infected subjects in whose later years it figures only among those indelible reminiscences which teach the sternest lessons of life.

James Nevins Hyde.

BIBLIOGRAPHY.

The literature of syphilis has accumulated to such an enormous extent that a full bibliography, in the limits assigned to this article, would be impossible. Appended is a brief but selected list of titles, embracing a few of the older classics of syphilitic literature and some of the modern standard treatises devoted to the subject:

Astruc, John: A Treatise of the Venereal Diseases, London, 1737.
Boeck, W.: Erfahrungen über Syph., Stuttgart, 1875:
Boerhaave, H.: De luë vener, 1762.
Desprès, A.: Traité théorique et prat. de la syph., Paris, 1879.
Dowse: Brain and its Diseases, London, 1879.
Fournier, A.: La syph. hérédit. Tardive, Paris, 1886.—Syph. et mariage, Paris, 1890.—L'Hérédité syphilitique, Paris, 1891.—Traitement de la syph., Paris, 1899. Les Affections Parasyphilitiques, Paris, 1900.
Hutchinson, J.: Syphilis, London, 1887.
Hyde, James N., and Montgomery, F. H.: Diseases of the Skin, New York, 1901.
Jullien, L.: Traité prat. des maladies vénér., Paris, 1899.
Keyes: Venereal Diseases, New York, 1891.
Lancereaux, E.: Traité hist. et prat. de la syph., Paris, 1873.
von Lesser: Encycl. der Haut. und Geschlechtskrankheiten, 1900.
Lang, E.: Vorlesungen über Pathol. u. Therap. der Syph., 1896.
Morrow, P. A.: System of Genito-urinary Diseases, Syphilology and Dermatology, New York, 1893.
Mansurrow, U.: Die Tertiär. Syph. Gehirn. Geschlkht. und deren Behandlung, Wien, 1877.
Mauriac, C.: Traitement de la syph., Paris, 1896.
Neisser: Ziemssen's Handbuch, Heft i., Leipzig, 1883.
Neuman: Spec. Path. et Therap. v. Nothnagel; Syphili. 1899, Festschrift, Wien, 1900.
Rollet, J.: Traité des maladies vénériennes, Paris, 1866.
Keyes, E. L.: Genito-urinary Diseases, with Syphilis, New York, 1888.
Zeissl, M.: Lehrbuch der venerisch. Krankheiten, 1902.

SYRINGOMYELIA. See *Spinal-Cord Diseases; Syringomyelia.*

TÆNIÆ. See *Cestoda* and *Anthelmintics.*

TALIPES. See *Foot, etc.*

TALLEY'S SPRINGS.—Mecklenburg County, Virginia.

Post-Office.—Palmer's Springs.

Talley's Springs are located seventy-five miles southeast of Petersburg, and within eight miles of the Atlantic and Danville Railroad on the north, and eleven miles of the Seaboard Air-line on the south. The situation is in a beautiful valley, the surface being clothed in a magnificent growth of original oak. The country is moderately hilly in character, and the climate very genial and salubrious. The springs have never been developed, but the waters have been resorted to by residents of the district for many years, and numerous cases are cited which illustrate their beneficial effects. A partial analysis has shown the presence of lithia, sulphur, and iron. A strong odor of sulphureted hydrogen pervades the neighborhood. The water is said to have a wonderful preservative power. We are informed by Mr. G. W. Davis, the owner, that a small green log which has lain in the spring between thirty and forty years is still perfectly sound. It is stated that the advantages of these strong waters and the many attractive features of the neighborhood will soon be turned to good effect and a desirable summer resort established. Palmer's Springs, which also possess a local reputation, are two miles away.

James K. Crook.

TAMARIND.—(*Tamarindus*, U. S., P., B. P.; *Pulpa Tamarindorum Cruda*, P. G.; *Tamarinier*, Cod. Med.) The preserved pulp of the fruit of *Tamarindus Indica* (fam. *Leguminosæ*). The tamarind is a large, handsome, widely spreading, locust-like tree, with rough, dark-gray

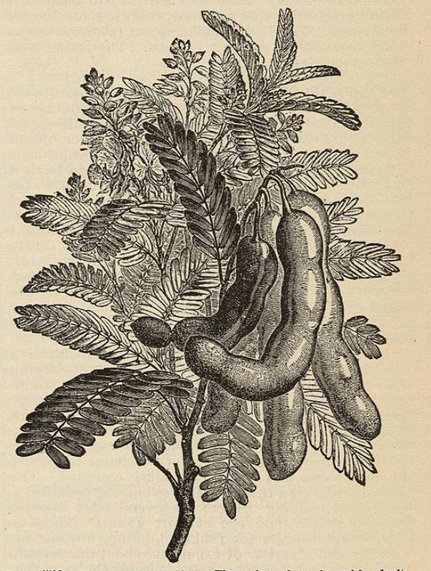

Fig. 4593.—Tamarindus Indica. Flowering branch with fruit. (Baillon.)

bark, and rather small, cassia-like, abruptly pinnate leaves. The fruit is a flattened, curved, solid "pod," from three to six or more inches long; smooth, yellowish-brown externally, with a brittle shell, and a firm acid pulp surrounding the seeds. The pulp contains a skeleton of fibrous bundles running lengthwise over the seeds. The tamarind tree grows now in all tropical countries, and is, besides, extensively cultivated. It came originally from the Old World, presumably from Africa, but is equally abundant in India, Australia, and the West Indies. When the fruits are ripe, the outer shell becomes brittle and is broken between the fingers and removed, the entire contents being then packed in kegs and covered with boiling syrup. In this way the West Indian tamarinds, which comprise most of those that reach our market, are prepared. In the East, sugar is often used instead of syrup, or they may be packed dry, without any sweetening, in a hard, semisolid mass.

Preserved tamarinds, as they reach us, are in a moist, reddish-brown, pulpy, stringy mass, with numerous flattish-quadrangular, smooth seeds, and a little thick,

dark syrup. They have a pleasantly sweet and acid taste. Mixed with water, they make a pleasant acid drink, which was formerly used in fevers and other forms of sickness. They are much less employed at present.

Composition.—Citric acid, eight or nine per cent., is the important constituent. About one and one-half per cent. of tartaric acid, a little malic acid, and, say, three per cent. of potassium bitartrate, are adjuvants to the former, and add to the acidity of the fruit. Gum, jelly, and ordinary vegetable matters, and, in our preserved tamarinds, the sugar that is added, complete the list of constituents.

Uses.—Tamarinds are rather an agreeable luxury than a medicine and in some countries are consumed extensively as a preserve. They possess some slight laxative properties, like prunes, barberries, figs, and other acid and sugary fruits. Here they are used to make a refreshing acid drink or as an adjuvant to some laxative compound. The Confection of Senna (*Confectio Sennæ*, U. S.) contains ten per cent. of them. The dose of tamarinds is indefinite. *W. P. Bolles.*

TAMPA, FLORIDA.—This winter health resort, which acquired a somewhat unpleasant notoriety during the Spanish-American War on account of the hardships and illness suffered by the United States troops en route to Cuba, is situated about midway of the peninsula of Florida, on the Gulf side, at the head of Tampa Bay. It is about twenty-five miles distant from the coast, in Lat. 27° 57′ N., and has a permanent population of 15,839. It is one of the important commercial cities of Florida, and has extensive manufacturing interests, principally in cigars, employing large numbers of Cubans. There are various churches, an opera-house, street cars, electric lighting and water works, sewers, and clean-paved streets. Port Tampa, where the largest steamers land, is nine miles from the city, with which it is connected by rail, and from here steamers leave for Havana and various Gulf ports.

On the opposite bank of the Hillsborough River, at the mouth of which Tampa is located, is the Tampa Bay Hotel, situated in a beautiful park of one hundred and fifty acres, with a botanical garden containing a great variety of native and imported trees and plants. This hotel is one of the most imposing and extensive in Florida—the land of extravagant buildings of this sort. It is of Moorish architecture and contains nearly five hundred rooms, and is most luxuriously equipped. Connected with it is a casino, with a swimming pool, and an exposition building. There are several other hotels in the city proper, and one at Port Tampa. There are many opportunities for fishing, hunting, boating, and driving, and a variety of excursions about the beautiful bay. The surrounding country is sandy, but nevertheless supports a luxuriant tropical vegetation, groves of orange, lemon, and pine trees abounding.

The climate is a warm, equable, moist one, the mean annual temperature being nearly that of Cairo, Egypt. Both in climate and vegetation Tampa partakes of the characteristics of southern tropical Florida. It is well to remember that it was in May, June, and July that the United States troops congregated at Tampa, not the season when the visitor or invalid resorts to a warm country. Moreover, it was probably quite as much due to the sudden assemblage of a large body of men at this point as to the climate that the illness occurred. On account of the humidity and enervating quality of the climate, such a resort as Tampa is not favorable for tuberculosis; but it is useful for a variety of cases needing a mild, equable, sunny, winter climate, as has been indicated in the article upon *Florida* in Vol. IV. of the Handbook.

The accompanying chart gives the various climatic data for the four winter months and also for July. The characteristic features are seen to be mildness and equability of temperature, a high humidity, much sunshine, and a comparatively high annual rainfall, the larger part falling during the summer, features common to all the coast resorts of the Florida peninsula.

Climate of Tampa, Florida. Latitude, 27° 57′ N.; Longitude, 82° 28′.

	Dec.	Jan.	Feb.	Mar.	July.	Year.
Temperature—Degrees Fahr.						
Average or normal	62.2°	58.6°	63.1°	66.4°	81.5°	71.6°
Mean of warmest	71.2	67.8	71.7	75.8	89.6	80.5
Mean of coldest	53.2	48.0	54.6	56.9	73.5	62.8
Average daily range	18.0	19.8	17.1	18.9	16.1	17.7
Highest or maximum	81.3	78.1	80.5	84.2	93.2	94.4
Lowest or minimum	34.7	32.7	35.7	39.7	70.0	28.1
Humidity—						
Average relative	83.4%	81.6%	83.8%	80.0%	82.4%	81.2%
Precipitation—						
Average in inches	1.57	2.45	2.81	2.68	7.99	53.09
Wind—						
Prevailing direction	N.	N.	N. E.	S. E.	E.	N. E.
Average hourly velocity in miles	6.0	6.0	6.9	6.7	5.2	6.1
Weather—						
Average number clear days	12.1	9.5	8.4	11.7	7.0	115.0
Average number fair days	12.3	16.4	14.3	14.4	20.0	188.2
Average number clear and fair days	24.4	25.9	22.7	26.1	27.0	303.2

Tampa is readily reached by rail direct, or one can make a portion of the journey by water.

Edward O. Otis.

TANNAL, aluminum basic tannate, $Al_2(OH)_4.(C_{14}H_9O_9)_2 + 10H_2O$, is a brownish-yellow powder formed by precipitating an aluminum salt with tannic acid in the presence of an alkali. It is employed as an astringent dusting powder for wounds and ulcers, and as an insufflation in catarrhal conditions of the nose and throat. It is insoluble in water, but its combination with tartaric acid dissolves readily and is known as "soluble tannal." The solution, however, slowly decomposes.

W. A. Bastedo.

TANNALBIN is a tasteless, odorless, light-brown powder made by drying tannin albuminate at 110°–120° C. It is light and bulky and contains about fifty per cent. of tannic acid. It is insoluble in water or the gastric juice, but slowly dissolves in alkaline media, as in the intestine. Though tannalbin has very little astringency, the weight of evidence indicates that it is as efficient in diarrhœal conditions as any of the astringent drugs. It presumably sets free its tannic acid in the intestine, since Leonard Weber, Einhorn, Vierordt, and many others report an apparently prompt astringent action in tuberculous enteritis, enterocolitis, the summer diarrhœas of children, and acute or chronic dysentery. Most authors claim that it does not act at all in the stomach, but W. H. Porter recommends it in chronic catarrhal conditions of that organ, stating that its free administration arrests the excessive secretion of mucus. It is administered in capsule or in mixture, or in combination with small doses of calomel, or mixed with starch water as an enema. The dose for an adult is about 1 gm. (gr. xv.) several times a day. Ten grams (ʒ iiss.) a day have been given for several days without untoward effect.

W. A. Bastedo.

TANNIC ACID.—(*Acidum Tannicum*, U. S., Br., Ger. *Gallotannic Acid. Digallic Acid. Tannin.* $HC_{14}H_9C_9 = 321.22$.) An organic acid obtained from nutgall. A light-yellowish amorphous powder, usually cohering in the form of glistening scales or spongy masses, odorless, or having a faint, characteristic odor and a strongly astringent taste; gradually turning darker when exposed to air and light.

Tannic acid is freely soluble in both alcohol and water, as well as in glycerin. The characteristic blue-black color produced in a solution of tannic acid when a ferric salt is added forms the basis of tests for its presence. The form of tannic acid here considered is characterized by its convertibility into gallic acid, of which it is the anhydride. Although generally stated that it occurs in some other varieties of gall and in several other vegetable substances, certain differences are perceptible in these, and it has been questioned whether any of them can be considered as identical with the one under consideration. It may be extracted from the powdered galls by several processes. The most convenient method is to exhaust the latter with warm water and then thoroughly remove the impurities by churning with ether. The most common impurity present is resin, though after a time more or less gallic acid is likely to be formed, if carelessly preserved, the properties thus becoming weakened. Tannic acid is associated in the plant with more or less glucose, a part of it apparently combined as a glucoside, and this glucose often exists as an impurity of tannic acid.

Incompatibility.—The wide distribution of tannic acid, or its associates in the group, among vegetable drugs, lends great importance to its numerous incompatibilities, the more important ones being here stated. Tannin is slowly destroyed by remaining in aqueous solution, the process hastened by heat. Alkaloidal salts in aqueous or weak alcoholic solution are decomposed by tannin, their tannates, which are but slightly soluble in water, being precipitated. Other organic substances whose solutions are precipitated by tannic acid are albumen, gelatin, gluten, starch hydrate, and many glucosides and amaroids. A solution of antipyrin is also precipitated and iodoform is decomposed. Tannin in a solution of iodine prevents the latter from turning starch blue. Tannic acid is incompatible with ferrous salts, giving a gelatinous precipitate, and with ferric salts, giving a black color to a weak solution (its physiological action being not thus destroyed), and a black precipitate with a strong one, the strength correspondingly weakened. Solutions of salts of lead, copper, silver, chromium, mercury, bismuth, antimony, and most other metals yield tannates as precipitates, and nitric acid converts it into oxalic acid. With sulphuric, nitric, and hydrochloric acid, precipitates are yielded. Hydriodic acid is formed when tannin is added to iodine with water. Oxidizing agents are reduced by tannin. The stronger of them, like potassium chlorate, may produce explosions when triturated with tannic acid. With spirit of nitrous ether or amyl nitrite, a gas is yielded. Chlorine, iodine, and bromine are incompatible. Lime-water and tannin yield a precipitate, as do potassium and ammonia and their carbonates.

The physiological actions and uses of tannic acid depend almost wholly upon its chemical property of coagulating albumen in the form of a tannate, and this is especially true of its local action. In this way, the following effects are produced: A protective film is formed upon raw surfaces; bleeding orifices, if small, are closed by blood clots in their mouths and by a contracting clot about them; relaxed muscular tissue is contracted, thus increasing the hæmostatic effect; it coagulates the saliva and buccal mucus, and it is probably due to its mechanical action that the taste and general sensation of the mouth are diminished; in the same way it blunts the appetite and checks digestive activity, but arrests gastric and intestinal hemorrhage, as well as intestinal discharges, the latter effect not to be confounded with that of a stimulation of the vaso-motor nerves by volatile oils and other stimulants. Here again the mechanical blunting of the nerve endings results in a decrease of the peristaltic action, tannic acid being thus one of our most important constipating agencies. Here its local action may be said to end, while its systemic action becomes that of gallic acid, to which the reader is referred. It may be mentioned, however, that tannic acid has a distinct irritating tendency, which becomes apparent when overdoses are taken. In this way it may act as an emetic or even as a purgative.

The uses of tannic acid thus fall naturally into two classes, one of which is to be found discussed under gallic acid. Its chief local uses are to protect and stimulate the healing processes in all simple ulcers and in skin diseases which exhibit a superficial inflammatory tendency. Mild hemorrhages of the skin or of the nares, mouth, stomach, or intestines may be promptly arrested by it, the dry powder being best where direct application is possible. Excessive and malodorous local perspirations are checked, as well as foul exudations from the mucous membranes of nose, throat, and uterus. At the same time, an overrelaxed condition of these membranes, as well as of the rectum when hemorrhoids are present, is promptly corrected, although the effect is likely to be but temporary. Acute inflammatory conditions of the fauces, and to a less extent of the stomach, are often promptly relieved. Inhalation of a spray of tannic-acid solution will check many cases of hæmoptysis, and this method, when possible, is much more efficient than its internal administration. The ordinary dose is gm. 0.06 to 0.3 (gr. i.–v.), but this is often largely increased in order to check hemorrhage. The official preparations are the styptic collodion, the glycerite, and the ointment, each of twenty-per-cent. strength, and the troches, each containing about one grain. A five-per-cent. or ten-per-cent. aqueous solution is often used for irrigating the nares or the vagina. *Henry H. Rusby.*

TANNIGEN, di-acetyl tannin, $C_{14}H_8(CH_3CO)_2O_9$, is a yellowish-gray, odorless, and tasteless powder, prepared by the action of acetic anhydride or acetyl chloride on tannic acid dissolved in glacial acetic acid. It dissolves in dilute solution of sodium borate or phosphate and in alcohol, is slightly soluble in ether, and is insoluble in water, though it tends to absorb moisture from the air. It is decomposed by alkalies, and is colored blue-black by ferric salts. Passing unchanged through the stomach, it is broken up in the intestine, where the slow liberation of tannic acid gives a mild and continuous astringent effect. In diarrhœa, dysentery, and especially the summer diarrhœas of children, Clark, Biedert, Escherich, and Ewald have found it superior to the preparations of krameria, catechu, hæmatoxylon, and other vegetable astringents. Williams of Boston, Müller, and others recommend it in the diarrhœas of tuberculosis. The dose is 0.1 gm. (gr. iss.) several times a day for young children, and 0.35–0.7 gm. (gr. v.–x.) for adults.

Clark suggests the following for use in leucorrhœa: ℞ Tannigen 4 gm. (ʒ i.), boric acid 8 gm. (ʒ ij.), zinc sulphate 0.7 gm. (gr. x.) fluid extract hydrastis 8 c.c. (ʒ ij.). Dissolve in a cup of hot water and add to three quarts of hot water for injection. Tannigen has also been employed as an insufflation in nose and throat affections. *W. A. Bastedo.*

TANNOFORM, methylene di-tannin, methylene di-gallic acid, $CH_2(C_{14}H_9O_9)_2$, is a condensation product obtained by adding a solution of formaldehyde to a solution of gallotannic acid in hot water and precipitating with hydrochloric acid. It is a loose pinkish-white powder, insoluble in water or acids and soluble in alcohol; it dissolves in alkalies with decomposition.

In the intestine tannoform sets free tannic acid and formaldehyde, and has been so used as an intestinal astringent and antiseptic. But it is not very widely employed thus, because of the possible irritation of the formaldehyde. It is a clean, dry antiseptic and deodorizing powder, and is used either pure or diluted with starch or talcum. In wounds, ulcers, and bedsores it seems to have marked healing properties, in hyperidrosis and bromidrosis it is siccative and deodorizing, and in moist eczema, pruritus, intertrigo, and burns it forms a serviceable dusting-powder. In chronic catarrh of the nasal passages, especially in ozæna, it is used as an insufflation.

Similar compounds prepared from formaldehyde and the tannins of aspidosperma, oak bark, and cinchona are called respectively *quebrachinoform*, *quercinoform*, and *quinoform*.

The bismuth salt of tannoform is "*bismal.*"

W. A. Bastedo.

TANNOPIN or Tannon, $(CH_2)_6N_4.3C_{14}H_{10}O_9$, is a condensation product of tannic acid and hexamethylenetetramine (urotropin). It contains eighty-seven per

cent. of tannic acid and is a brown, odorless and tasteless, slightly hygroscopic powder, which is insoluble in water, alcohol, ether, or weak acids, but dissolves, probably undergoing change, in weak alkalies. It is said to liberate tannic acid and formaldehyde in the intestine, and for this reason is employed as an intestinal antiseptic and astringent. Schreiber, Meier, and Tittel have reported highly satisfactory results in tuberculous enteritis, and in acute, subacute, and chronic diarrhœas. The dose is 0.2–1 gm. (gr. iij.–xv.) several times a day.

W. A. Bastedo.

TANNOSAL, or Creosal, is the tannic acid ester of creosote, representing sixty per cent. of the latter. It is a dark-brown powder with biting taste and a slight odor of creosote, and is soluble in water, alcohol, and glycerin. As it sets free tannic acid and creosote in the intestine, it is employed as a means of administering creosote in pulmonary tuberculosis, or as an intestinal antiseptic and astringent. The dose is 0.2–1 gm. (gr. iij.–xv.) several times a day. As it is hygroscopic, a solution is marketed containing 1 gm. (gr. xv.) in each tablespoonful

W. A. Bastedo.

TANSY.—(*Tanacetum*, U. S.; *Tanasia*, Cod. Med.) The dried leaves and top of *Tanacetum vulgare* L. (fam. *Compositæ*). Tansy is a perennial herb, native of Europe and Southern Asia. It was introduced into the United States as a cultivated aromatic and has become abundantly naturalized as a weed along roadsides and in waste places. The stems are somewhat tufted, erect, nearly simple, a foot or two, rarely a yard, high; leaves shortly and stoutly petioled, rarely exceeding 20 cm. (8 in.) long and 10 cm. (4 in.) broad, obovate when flattened, pinnate, the pinnæ about ten or twelve pairs, linear-oblong, obtusish, pinnatifid, their segments oblong, acute, incisely serrate or lobed; thin, with a strong midrib, smooth, dark-green, finely depressed-glandular; flower heads in a small, loose, terminal corymb, long-peduncled, yellow, nearly 1 cm. (about ½ in.) broad, having an imbricated, saucer-shaped involucre, a convex, naked receptacle, and numerous yellow tubular florets, which are perfect, or the outer circle pistillate; highly and peculiarly aromatic, the taste pungent and very bitter.

It contains the peculiar bitter substance *tanacetin*, which is amorphous, very hygroscopic, and soluble in both alcohol and water. This imparts the most of the bitter taste, although the volatile oil is also bitter. The latter exists to the extent of about one-fourth of one per cent., has a specific gravity of about 0.955, and is of a yellowish-green color, becoming more or less brown upon exposure. It is soluble in about three parts of seventy-per-cent. alcohol. It is highly aromatic, bitter, and pungent, its important constituent being *thujone* (*tanacetone*). Tansy also contains some tannin, malic acid, and other unimportant constituents.

Besides the properties of tansy as one of the more powerful aromatic bitters, together with the diaphoretic and diuretic properties of its class, it and its oil have been used from time immemorial as anthelmintics. Oil of tansy, and tansy itself in large doses, are poisonous, the general symptoms being similar to those of the coniferous oils (juniper, turpentine, savin, etc.). These symptoms are: great irritation, vomiting, abdominal pain, painful diuresis, convulsions, coma, and death. They belong to the more painful class of poisons. They are also powerfully emmenagogue, though the symptoms are painful and the use of the drug for this purpose is not desirable. They are liable to cause abortion, though they usually fail of this purpose when taken with such intent, as is commonly done.

The dose of tansy is 1 to 4 gm., usually in the form of the fluid extract (1 to 4 c.c.), though this represents the extreme dose which should be used. The oil may be administered in doses of ♏ i.–v. So little as a fluid-drachm of the oil has proved fatal.

Henry H. Rusby.

TAPHOSOTE is a grayish syrupy liquid of faint odor and taste and containing tannic acid, creosote, and phosphoric acid. It is employed in pulmonary tuberculosis and as an intestinal antiseptic and astringent. The dose is 4 c.c. (℥ i.).

W. A. Bastedo.

TAPIOCA.—*Manioca; Mandioca; Cassava Starch.* The starch of *Manihot utilissima* Pohl ("Sweet Cassava") and of *M. Aipa* ("Bitter Cassava"), (fam. *Euphorbiaceæ*).

The genus Manihot contains some eighty species of tropical America. Besides the above species, used as food, the genus is important as a rubber-yielder, by the species *M. Glaziovii* Muell. Arg., a small tree of Brazil. Our only interest in the Manihot is from a dietetic standpoint, if we except the poisonous properties of the bitter variety, due to the presence in it of hydrocyanic acid. The starch-yielding part is the cluster of large fleshy roots, which much resemble sweet potatoes, save in their paler color. These roots, under the above names, as well as that of *Yuca*, constitute the principal edible root crop of Brazil. Their use, boiled and baked, for the table, as well as for bread-making, far exceeds that for the manufacture of tapioca. Even among savage tribes, who had never before seen white men, the writer has seen it thus in use. Although slightly sweetish, it is far more like a white than a sweet potato in flavor. The finely ground pulp, pressed, dried, and then pulverized, is cassava meal, and is made into bread, in huge circular cakes, a yard in diameter and nearly a half-inch in thickness. These are transported in bales, bound with leaves. Their special advantage is to be found in their long-keeping qualities. The taste is negative rather than strongly pronounced, thus well qualifying the article for staple use. Bitter cassava is rarely used in its entirety, but is made into bread, or tapioca, after the poison has been dissipated by fermentation and other processes. The extraction of cassava starch as commercial tapioca differs only in details, as regards convenience, from that of other starches. It is, however, partly hydrated to cause it to form in the peculiarly irregular and hard masses known to us. In many parts of Brazil, dry tapioca is served at table, as a side-dish, as a substitute for bread. This is usually in smoothish, yellowish grains, resembling pebbles, very hard and trying to both teeth and gums. Tapioca is merely an amylaceous food, and has no medicinal properties.

Henry H. Rusby.

TAR.—*Pine Tar* (*Pix Liquida*, U. S. P., B. P., P. G.). An empyreumatic oleoresin obtained by the destructive distillation of the wood of *Pinus palustris* Miller, and of other species of *Pinus* (fam. *Pinaceæ* or *Coniferæ*).

The essential features of tar distillation are the partial burning of a wood rich in turpentine, the heat thus produced serving to expel from the wood near it the volatile and liquid products present, or which form during the process, the volatile ones ascending into the flame and being destroyed, the heavier ones settling downward and being collected as tar. It is almost altogether performed in rude stills constructed in the forest where the wood is gathered. The still is formed by stacking the wood upon a level and hardened spot of ground, surrounding it with a trench leading into a pit and surrounding the stack with a circle of earth and sods, thus preventing the free access of air. The stack is then ignited at the top and slowly burns downward, the expelled tar gradually trickling to the bottom and flowing into the pit, from which it is removed and stored in barrels, in which it hardens and is marketed. The wood used consists chiefly of dead branches and trunks and stumps of the trees which have been killed by tapping for turpentine. Tar is thus described by the Pharmacopœia:

"Thick, viscid, semi-fluid, blackish-brown, heavier than water, transparent in thin layers, becoming granular and opaque with age; odor empyreumatic, terebinthinate; taste sharp, empyreumatic.

"Tar is slightly soluble in water, soluble in alcohol, fixed or volatile oils, and solution of potassium or sodium hydrate.

"Water agitated with tar acquires a pale yellowish-brown color and an acid reaction, yields with ferric chloride T.S. a transient green color, and is colored brownish-red by an equal volume of calcium hydrate T.S."

The composition of tar is highly complex. Its constituents are, as might be expected, closely similar to those of coal tar, the sources of the two differing more in the length of time consumed in the production than in the essentials of the process. A large number of these constituents and their products are considered under separate titles in this work. The more important constituents are contained in the oil, considered below, and in the pyroligneous acid, which, when distilled off, leave *common pitch* or *naval pitch* (*Pix navalis*). In the distillate the acid and the oil separate, either on account of their different distilling points or on account of their different specific gravities. The acid is a source of acetic acid and numerous other substances. The relative percentages of the different portions, as also of the constituents of the latter, differ widely in different tars, depending upon the kind of wood employed, its condition and character, the details of the distillation, etc., so that both tar and tar oil are exceedingly irregular in character. The properties of tar are considered below, under Oil of Tar. Tar is itself employed externally, chiefly in the form of the *ointment* (*Unguentum picis liquidæ*, U. S. P., consisting of 50 parts of tar, 12½ parts of yellow wax, and 37½ parts of lard), and internally chiefly in the form of the *syrup* (*Syrupus picis liquidæ*, U. S. P., containing 7½ parts of tar, 10 of glycerin, and 80 of sugar, with water to make 100). The dose of tar is 1 to 4 gm. (grs. xv. to lx.); of the syrup, about four times as much. Tar is often given in the form of the water, made by thoroughly stirring four ounces of tar in a pint of water, allowing to settle, and decanting. Of this, half a tumblerful may be taken three or four times daily, and it is an excellent antiseptic diuretic.

Oil of tar (*Oleum picis liquidæ*, U. S. P.) is thus described in the Pharmocopœia: "An almost colorless liquid when freshly distilled, but soon acquiring a dark reddish-brown color, and having a strong, tarry odor and taste. Specific gravity about 0.970 at 15° C. (59° F.). It is readily soluble in alcohol, the solution being acid to litmus paper." It contains, as its principal part, creosote, which in turn consists of *guaiacol*, cresol, creosols, and phlorol, and which has been elsewhere considered; carbolic acid in small amount, toluene, xylene, paraffin, naphtalene, pyrocatechin, etc.

Oil of tar possesses, in lesser degree, the antiseptic and poisonous properties of the substances which it contains, as above stated. It has at the same time the diuretic and diaphoretic, as well as the irritant properties of the closely related substance oil of turpentine, though in milder degree, but is more distinctly expectorant than that substance. Its uses, both professional and domestic, depend directly upon these properties. As a counter-irritant, its action is very mild, and it is an excellent chest application for young children. Its antiseptic action is often secured as a constituent of mixtures destined for inhalation purposes. Internally, its chief use is in bronchitis, especially the chronic form, and its internal administration is commonly combined with its use as an application to the chest. Oil of tar is less frequently administered than the syrup, but may be given in doses of ♏ i. to v. or even ♏ x. There is no official preparation.

Henry H. Rusby.

TARASP-SCHULS.—This health station and spa is situated in the Lower Engadine Valley, thirty-four miles from Samaden, with which it connects by diligence twice daily. It consists of the three places, all near together, Tarasp-Schuls, Schuls, and Vulpura. Schuls, 3,970 feet above sea level, is the largest village in the Engadine, and contains about a thousand inhabitants. It is picturesquely situated on a slope of the valley, with the Inn below and, opposite, a stately range of well-wooded mountains, and is divided into an upper and a lower town, in the former of which most of the hotels and pensions are situated. On the high-road separating the two portions of the town is situated the bathing establishment, with eighteen bath- and two douche-rooms for iron and fresh-water baths.

Vulpura is a suburb consisting of large and well-appointed hotels, lying on the opposite side of the river from Schuls, and about two hundred feet above it, on a thickly wooded height. It is at a distance of twenty minutes from the Kurhaus Tarasp, by a good road.

On the high-road about a mile to the west of Schuls are the baths of Tarasp, consisting of an extensive Kurhaus with a "pump-room" and baths, and surrounded with pleasant gardens and parks. The whole country about is most attractive, and affords innumerable opportunities for walks and excursions in every direction, amidst grand scenery and in a pure mountain atmosphere. One who desires to take a course of these waters can conveniently reside at any of the three localities.

The climate of this region is somewhat milder than that of the Upper Engadine, although it partakes of the same general characteristics, viz., a rarefied atmosphere, moderate temperature, dry air and free from dust, protection from high winds, and increased intensity of the sunlight and heat. The mean temperature during the season (June 1st to September 15th) is 57.14° F.; the maximum, 87.08° F.; and the minimum, 33.8° F. The mean relative humidity is from 65 to 75 per cent., and there is an average rainfall of 9.40 inches. There are on an average during the season 39 perfectly clear days, 27 fair ones, 34 more or less overcast, only 6 or 8 of which are actually rainy.

The effect of the climate iss timulating and tonic, and may be rather severe for delicate persons, as sudden changes occur. For one, however, fairly robust and who desires to unite the high mountain air cure with a course of the waters and baths offered here, hardly a more admirable and charming resort could be found. "Scarcely another station in Europe," says Linn, "unites so many important qualities."

There are eight cold mineral springs that are used at this resort, although there are many more in the neighborhood. Four of the springs used yield sulphated alkaline waters of the class known as the "Cold Glauber's Salt Springs," similar to those at Carlsbad. The Lucius and Emerita Springs of this class are used for drinking and bathing; and the Ursus- and Neue Bade Quelle are only used for bathing. The rest of the springs are iron, yielding a gaseous chalybeate water known as "Sauerwasser." Of these the Bonifacius is used for drinking alone; the Wy for drinking and bathing; while the Carola is used for bathing alone. The four springs of Sotsass are used as a favorite table water. Compared with the waters of Carlsbad, Marienbad, Kissingen and Vichy, the Lucius Spring at Tarasp contains about the same amount of sulphate of soda as Carlsbad, but nearly or quite three times as much carbonate of soda and chloride of sodium, and at least three times as much carbonic acid. The carbonate of soda is slightly in excess of that found in the water of Vichy, and the chloride of sodium is about a fourth less than at Kissingen. Marienbad contains more sulphate of soda, but less of the other ingredients.

The analysis of the Luciusquelle by Husemann is as follows:

In Sixteen Ounces of the Water there were:

Sulphate of soda	16.131 grains.
Sulphate of potash	2.916 "
Borate of soda	1.312 "
Nitrate of soda	.006 "
Chloride of sodium	28.216 "
Chloride of lithium	.022 "
Bromide of sodium	.173 "
Iodide of sodium	.007 "
Bicarbonate of soda	37.426 "
Bicarbonate of ammonium	.507 "
Bicarbonate of lime	18.800 "
Bicarbonate of strontium	.005 "
Bicarbonate of magnesia	7.524 "
Bicarbonate of ferric oxide	.165 "
Total amount of fixed solids	113.210 "
True free carbonic acid	33.92 cu. in.