Pilocarpidine ($C_{11}H_{14}N_2O_2$) is also present, and can be artificially produced from the former. It is soluble in water. Its action differs in slight particulars from that of pilocarpine.

Jaborine ($C_{22}H_{32}N_4O_4$) is also a derivative of pilocarpine. It is yellowish and syrupy, or becomes a soft solid. It is soluble in alcohol, but only slightly in water. Although its action is opposed to that of the others, there is so little of it as not to interfere greatly when the entire drug, or a preparation which certainly contains all its constituents, is used.

Action.—In almost every particular jaborandi is directly antagonistic to belladonna. Its essential action is to stimulate the secretions, with the exception of those of the kidney and the mammary gland. In the liver, the production of sugar is increased, but not that of the bile. The secretions most affected are those of the skin, the salivary glands, and the pancreas, but those of eyes, ears, stomach, and intestine all share markedly in the result. Salivation is the first to appear, and diaphoresis begins as that diminishes. The salivary, and especially the sudorific, increases are the greatest known in the case of any drug, and are sometimes quite phenomenal. The watery portion is most increased, but there is also some increase in the solid portion. The mode of operation appears to be the stimulation of the nerve endings in the gland. The production of leucocytes is notably increased. There is hyperæmia of the tissues whose activity is increased, but this seems secondary to, and dependent upon, the former. Through the increased heat radiation there is a fall of temperature. The powerful contraction of the pupil, also through stimulation of the nerve endings, illustrates what takes place in many other involuntary muscles. The blood-vessels are not thus affected, so there is not the increase of blood pressure that we should expect. Neither is the heart so affected, but the terminal filaments of the vagus in this organ are usually stimulated and the movements of the heart as a whole are slowed. This effect is, however, quite uncertain. Nausea is apt to follow the other symptoms after large doses have been taken.

Use.—The uses of jaborandi, though already very important, are by no means developed, especially that as a stimulant to intestinal digestion, through increased pancreatic secretion. It will probably, in future, have a wide and important use in this direction. Its present use is almost wholly as a sudorific, and it seems to work well in all cases in which increased perspiration can be of service. It is especially valuable in removing dropsical accumulations, and, while not itself directly affecting the existing disease, the improved condition is often the cause of complete recovery. It is also of special value in uræmia, in which condition it washes out from the skin accumulated waste and clears the way for further depurative action. By early relieving congestion, in case of a threatened cold, the latter can be averted, but the patient must be carefully protected. It promotes to a marked extent the nutrition of the nails and hair, as well as of the skin generally, and its use in cutaneous diseases is a still largely unworked field. It is often productive of great benefit in promoting a new growth of hair, even when locally applied. The hair at the same time becomes oily and is apt to become darker. Some well-known and curious accidents in producing dark spots upon white hair have occurred. The alkaloid is often used locally as a substitute for eserine in the eye, while its internal use relieves congested states of that as of other organs.

Several cautions are to be observed in the use of jaborandi. It may produce, and will increase the tendency to, abortion. Ordinarily, small doses are to be preferred, as there is a great tendency to reaction after its use, mental as well as great physical depression, and lack of secretion. The jaborine content should be avoided as far as possible. Since this is insoluble in water, but soluble in alcohol, while pilocarpine is soluble in both, a weak alcoholic menstruum is to be preferred, and commonly the use of the alkaloid, carefully prepared, is even better. The Pharmacopœia provides a fluid extract, made with diluted alcohol, the dose of which is 0.6–4 c.c. (♏x.–lx.). The dose of pilocarpine is 0.01–0.02 gm. (gr. $\frac{1}{6}$–$\frac{1}{3}$). For ocular instillation, a one-per-cent. solution is to be preferred, and one or two minims will be found sufficient.

Henry H. Rusby.

JACKSONVILLE, FLORIDA.—The city of Jacksonville, the largest in Florida, is situated about 25 miles from the mouth of the St. John's River, on its left bank. It contains 30,000 or more inhabitants, which are largely added to during the winter months by transient visitors and invalids seeking a mild and salubrious climate. The city is well laid out with wide and well-shaded streets and parks, and offers all the advantages to be expected from a city of this size: good public schools, a library, opera house, public halls, and churches of various denominations. There is a good water supply from artesian wells, and a system of sewerage introduced under the direction of the late Colonel Waring. The death rate is low. There are good shell roads leading out of the city which afford good driving and cycling. The various excursions on the river are also attractive.

If one desires to spend the winter in a city in a mild and sunny climate, Jacksonville offers many advantages. There are excellent and abundant accommodations of all kinds, from the hotel of five hundred guests to a variety of smaller boarding- and lodging-houses. Unfurnished cottages can also be obtained. The winter climate is mild and equable, and of medium moisture.

The following table gives the climatic data for the five winter months—November to March inclusive.

Climate of Jacksonville, Fla. Latitude, 30° 20′; Longitude, 81° 39′. Period of Observation Twelve Years.

	November.	December.	January.	February.	March.	Year.
Temperature—						
Average or normal	61.7°	55.8°	55.8°	58.1°	62.7°	69.2°
Average daily range	15.6	17.0	15.7	16.4	17.4	
Mean of warmest	70.9	66.4	64.9	68.5	73.6	
Mean of coldest	55.3	49.4	48.2	52.1	56.2	
Highest or maximum	84.0	81.0	80.0	83.0	88.0	
Lowest or minimum	30.0	19.0	24.0	32.0	31.0	
Humidity—						
Average relative	74.8%	73.7%	74.6%	70.6%	65.4%	72.0%
Precipitation—						
Average in inches	2.95	2.89	3.28	3.45	3.13	54.68
Wind—						
Prevailing direction	N. E.	N. E.	N. E.	N. E.	S. W.	N. E.
Average hourly velocity in miles	6.5	6.0	5.8	6.9	7.9	6.7
Weather—						
Average number clear days	9.8	10.2	9.0	9.7	12.7	123.2
Average number fair days	11.1	12.0	12.8	10.4	13.0	156.7
Average number clear and fair days	20.9	22.2	21.8	20.1	25.7	279.9

Edward O. Otis.

JALAP.—Jalapa. The tuberous root of *Exogonium purga* (Wend.) Lind. (*Ipomœa F.* Hayne; I. *Jalapa* Schiede and Deppe—fam. *Convolvulaceæ*).

This is a perennial, herbaceous twiner with numerous slender, twisted and furrowed, moderately branched stems, arising from ovoid, pear-shaped, or subspherical tubers, these often clustered or tangled together by roots and rhizomes. The flower is merely a large, handsome, rose-colored "morning glory." It is a native of Eastern and Central Mexico, from one town of which it has received its name (Jalapa). Jalap was known and brought to Europe as early as the beginning of the sixteenth century, if not before. Its botanical source was demonstrated first in the early part of this century, by Dr. Coxe, of Philadelphia.

The collection of jalap is carried on without much regard to season. The tubercles are dug up and dried by artificial heat, the smaller ones entire, the larger scored (usually lengthwise), or split or sliced. The heat employed is often sufficient to break the starch granules,

and so, when dry, the texture is often horny, on account of the hardened starch mucilage, irrespectively of the amount of resin contained. The cultivation of jalap is in its infancy.

Description.—The jalap tubercles are in part described above; the Pharmacopœial description is as follows: "Napiform, pyriform, or oblong, varying in size;

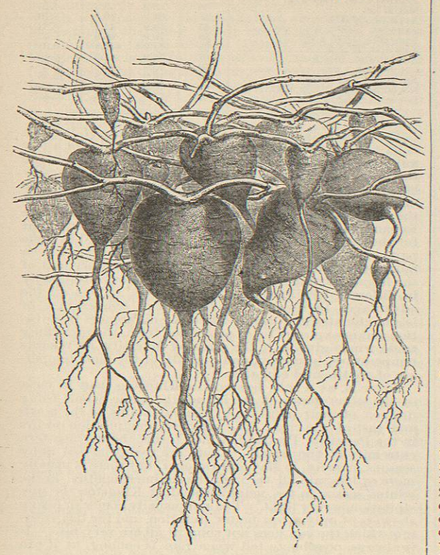

Fig. 2976.—Jalap Roots. (Baillon.)

the larger roots incised, more or less wrinkled, dark brown, with lighter-colored spots, and short, transverse ridges; hard, compact, internally pale grayish-brown, with numerous concentric circles composed of small resin cells; fracture resinous, not fibrous; odor slight, but peculiar, smoky and sweetish; taste sweetish and acrid.

"On exhausting 100 parts of jalap with alcohol, concentrating the tincture to 40 parts, and pouring it into water, a precipitate of resin should be obtained, which, when washed with water and dried, should weigh not less than 12 parts, and of which not over ten per cent. should be soluble in ether."

It is said that this requirement of twelve per cent. of resin is excessive and difficult, if not impossible, to attain in the commercial drug. Probably eight or nine or, at most, ten (as in the British Pharmacopœia) per cent. would be a reasonable requirement. Cultivation is an important factor, as under it twenty per cent. of resin has been produced. The dried tubercles of the market have shrunken and shrivelled considerably, and are usually much more acute than represented in the above cut of living roots.

Composition.—Jalap contains a large amount of sugar and of starch, substances which contribute to its taste and texture, but have no further value. Its active principle is a composite *resin*, the quantity of which determines the value of the article. This crude substance consists of two resins, both of which are soluble in alcohol, but only one of which (the most considerable) is also soluble in ether; the insoluble portion is called *convolvulin*. It is regarded as a glucoside. Merck gives the formula as $C_{31}H_{50}O_{16}$ and the dose as gr. i.–iij. It is only partly soluble in water. It is converted by alkalies into convolvulinic acid, which is active in three times the dose of the convolvulin. The jalapin is also active, and is the principal constituent of scammony. The crude resin of jalap is official (*Resina Jalapæ*, U. S. P)., and in common use.

Action and Use.—Jalap is one of a considerable number of active cathartics whose energy either lies in their resinous contents or is at present inseparable from them. Of these, however, it is one of the mildest and most uniform, and probably, in consequence, one of the most frequently employed. In full doses it produces free hydragogue catharsis, with more or less, but generally not excessive, nausea and griping.

It has been traditionally used as an adjuvant to calomel. Of its action upon other organs than the stomach and bowels but little can be said. It is doubtful whether much of it is absorbed. It will not act if injected hypodermically.

Administration. — Powdered jalap is frequently given, and contains so little woody tissue that it is a very good form. Dose, 1–1.5 gm. (gr. xv.–xx.); as a drastic purgative sometimes twice as much. The resin is about five or six times as active as the crude powder. The compound powder of jalap (Pulvis Jalapæ Compositus) is frequently of use in anasarca, when a combined effect upon the kidneys and intestines is desired. It consists of jalap, 35 parts, and cream of tartar, 65. Dose, a gram or so twice a day. There is also an official alcoholic extract, the dose of which is gr. ij.–viij. *Henry H. Rusby.*

JAMAICA.—Jamaica, a British colony, is an island in the Caribbean Sea, lying between 17° 43′ and 18° 32′ North Latitude, and 76° 11′ and 78° 20′ 50″ West Longitude. It is about 90 miles south of Cuba, nearly 5,000 miles from Southampton, and a little more than 1,400 miles from New York. It is 144 miles in length and from 21½ to 49 miles in width. The surface of the island is crumpled up into a central mountain range with numerous outlying spurs. The highest points of this range, contrary to the usual rule, are in the eastern portion, whence the surface slopes irregularly toward the west, where the only level parts of any extent are found. There is one principal range, called the Blue Mountains, running east and west through the centre of the island, and from this secondary ridges run north and south, themselves giving off other and shorter spurs in a direction parallel to the central range. The highest point is Blue Mountain Peak which rises to an elevation of 7,360 feet; Catherine's Peak has an altitude of over 5,000 feet; and there are several others, varying in height from 4,000 to 5,000 feet. The island is in general well watered, the abundance of rivers and springs in most parts giving plausibility to the generally accepted interpretation of the name, Jamaica, which is believed to have signified in the aboriginal tongue the "Isle of Springs," or the "Land of Wood and Water."

It is difficult, in a brief article of this nature, to describe satisfactorily the climate of Jamaica, as, owing to the diversity of elevation and other causes, it varies greatly in different parts of the island; in some parts it is hot, in others temperate and even cool; in some it is dry, in others the rainfall is very great; and indeed the only characteristic common to all the varying climates of Jamaica is equability. Thus, at the sea-coast the average temperature is 78° F. (the extreme range for the entire year being only 35° F.), while on the mountains at an elevation of between 4,000 and 7,000 feet the mercury ranges from 40° to 74° F., occasionally falling, on the summit of the highest peak and in midwinter, even to the freezing-point.

METEOROLOGICAL DATA FOR POINTS OF DIFFERENT ELEVATION IN THE ISLAND OF JAMAICA FOR 1899.*

HOPE GARDEN, ELEVATION 600 FEET.

Months.	Mean average temperature.	Maximum temperature.	Minimum temperature.	Range.	Humidity.	Rainfall in inches.
January	71.4°	85.0°	65.4°	19.6	81.5%	1.47
February	....	....	....	....	....	....
March	71.9	83.3	65.7	17.6	68.5	1.49
April	76.5	84.2	66.2	18.0	68.5	2.75
May	78.1	87.5	66.9	20.6	70.5	5.23
June	79.6	89.6	71.1	18.5	71.0	1.99
July	80.9	91.8	69.7	22.1	65.5	2.82
August	81.3	91.3	69.6	21.7	67.5	1.39
September	79.2	89.2	70.5	18.7	77.0	5.37
October	76.7	85.5	69.3	16.2	82.5	31.73
November	76.2	85.3	68.2	17.1	83.5	16.93
December	73.2	83.9	68.9	20.0	78.0	10.06

STONY HILL REFORMATORY, ELEVATION 1,400 FEET.

Months.	Mean average temperature.	Maximum temperature.	Minimum temperature.	Range.	Humidity.	Rainfall in inches.
January	71.8°	81.3°	63.4°	17.9	89.5%	1.47
February	72.0	82.9	63.0	19.9	....	0.55
March	72.4	81.2	64.4	16.8	83.5	2.36
April	72.5	82.6	63.4	19.2	90.5	3.79
May	75.8	85.2	64.3	20.9	88.5	5.79
June	75.9	86.8	66.0	20.8	83.0	3.93
July	77.8	87.6	67.6	20.0	76.0	5.21
August	78.0	88.3	67.7	20.6	81.0	1.64
September	76.8	87.1	67.5	19.6	79.5	9.99
October	74.8	84.0	66.5	17.5	81.0	34.93
November	73.4	84.9	65.6	19.3	73.0	19.41
December	71.4	82.1	61.8	20.3	84.0	9.23

MANDEVILLE, ELEVATION 2,100 FEET.

Months.	Year.	Maximum temperature.	Minimum temperature.	Range.	Days above 80°.
December	1900	81.7°	65.3°	16.4	6
January	1900	81.0	61.4	19.6	1
February	....	81.1	60.2	20.9	3
March	....	80.6	61.7	18.9	4
April	....	85.7	60.0	25.7	11
May	....	81.7	64.3	17.4	5
June	....	81.0	67.8	13.2	1
July	....	81.8	68.0	13.8	6
August	....	82.7	67.2	15.5	12

HILL GARDENS, 4,907 FEET.

Months.	Mean average temperature.	Maximum temperature.	Minimum temperature.	Range.	Humidity.	Rainfall in inches.
January	60.3°	67.4°	54.3°	13.1	86.0%	14.54
February	60.6	67.7	53.9	13.8	84.0	1.04
March	60.4	65.6	53.5	12.1	85.5	5.16
April	61.3	66.6	55.1	11.5	84.5	4.21
May	63.5	69.2	56.6	12.6	81.0	4.54
June	64.9	70.4	58.4	12.0	82.5	1.78
July	65.0	70.8	57.5	13.3	79.5	2.32
August	64.8	74.2	57.5	16.7	79.5	.76
September	65.4	72.5	59.8	12.7	85.0	5.39
October	63.0	68.0	58.6	9.4	89.5	41.32
November	62.7	67.7	58.0	9.7	88.5	44.09
December	60.5	66.5	54.4	12.1	83.5	16.90

*Through the kindness of Prof. W. H. Pickering, of the Harvard College Observatory, I have obtained the Jamaica weather report for 1899 from which the following meteorological data have been compiled for points of various elevation in the island; and to this are also added the maximum and minimum temperatures of Mandeville, observed by Professor Pickering during his nine months' residence there.—E. O. O.

BLUE MOUNTAIN PEAK, 7,423 FEET HIGH.

Time of observation.	Temperature.	Maximum.	Minimum.	Rainfall since last observation.
February 1st, 11:30 A.M.	56°	69.9°	38.8°	24.87
March 1st	56	68.9	39.8	4.15
April 1st, 11:30 A.M.	58	64.9	40.8	8.10
June 1st, 10:30 A.M.	65	69.9	44.8	8.23
June 30th, 11:15 A.M.	58	70.9	46.8	5.45
July 31st, 11 A.M.	59	71.9	46.8	6.05
August 31st, 10 A.M.	59	74.9	44.8	6.45
October 2d, 1 P.M.	67	73.9	43.8	12.90
November 1st, noon	59	70.9	42.8	15.95
November 30th, 11:30 A.M.	56	70.9	46.8	48.16
December 31st, 11:45 A.M.	69	70.9	46.8	45.45
	67	71.9	41.8	25.45

The most striking peculiarity of the climate of Jamaica is its variety combined with equability. A ride of a few miles into the hills will bring one from the torrid zone to the temperate—from an average temperature of nearly 80° F. to one of 65° or 70° F. But whatever district one may select, whether a warm or a cool one, he will find the temperature very nearly constant, the extreme range for any one month being seldom over 25° F., while that for the entire year at Kingston is but 35° F., and in some parts of the island the excursions of the mercury are even more restricted than this. The humidity in every part of the island is comparatively high, but varies considerably in different localities. Jamaica, indeed, enjoys all the advantages, in respect to uniformity of temperature, of island climates in general, while the differences in elevation and in exposure to, or protection from, the prevailing trade winds give to it the pleasing diversity, as regards temperature, humidity, and rainfall, of the most temperate of continental climates.

There is, as a rule, less rain in Kingston than in most of the other parts of the island, the trade winds being drained of their moisture by the mountains to the north and east of the city. The heaviest precipitation occurs in the Parish of Portland, which forms the northeastern extremity of the island. There are two principal rainy seasons, namely, in May and October, but there is usually more or less rain all through the summer months: in the winter season in the neighborhood of Kingston the precipitation is very light. The rain usually comes in heavy showers of only a few hours' duration, and the days during which the sun does not shine at all are very rare. It is always possible to tell when rain is coming, as it can be seen, quite a while before its arrival, advancing from the mountains, thus giving one ample time to get under cover before the downpour begins. This is fortunate for the visitor, as a wetting is one of the three things that an unacclimated person in the tropics must avoid, the other two being exposure to the direct rays of the noonday sun and to the cool night air.

The population of Jamaica, according to the census of 1891, is 639,491, an increase of about 60,000 since the census of 1881, and of 133,000 since that of 1871. The total estimated population on the 31st of March, 1899, was 730,725. The capital and chief city is Kingston, the largest and most important as well as the healthiest seaport town of the British West Indies. It is a city of 50,000 or more inhabitants, situated on gently sloping ground on the shores of a large land-locked harbor. The land on which the city lies is a gravel bed, and as it has a slope to the sea of about ninety feet to the mile the natural drainage is excellent. The water supply is drawn from two rivers at a distance of several miles from the city, and, as regards freedom from contamination, is above reproach.

The Myrtle Bank Hotel, pleasantly situated on the shore of the bay near the outskirts of the city, affords excellent accommodation for visitors, and there are also several other hotels and a number of boarding-houses where one may live modestly and at moderate expense. Another well-built hotel, having accommodation for one hundred and fifty to two hundred guests, is at Constant

Spring, six miles from Kingston, near the foot of the mountains which enclose in the form of an amphitheatre the Liguanea plain. The hotel lies at an elevation of five hundred feet above Kingston, and from it is had a fine view of the harbor and Caribbean Sea beyond. The temperature here is uniformly ten to twelve degrees lower than that of the city. Other comfortable hotels are found in Santiago de la Vega, usually called Spanish Town, which was formerly the capital of the island, and at Moneague, a charming spot in the Parish of St. Ann, on the northern slope of the central mountain range. Mandeville, a beautiful little place in the hills, celebrated for its delicious oranges, is a favorite resort for Jamaicans from Kingston and other coast towns who may feel the want of a change of air and scene. There are a hotel and several boarding-houses here, but intending visitors must take the precaution to apply in advance if they would be sure of being well suited. Among the coast towns on the north side of the island, Lucea, St. Ann's Bay, and Montego Bay are the most important from the point of view of the tourist and the invalid. In these and the other towns of the island visitors may find accommodation at various boarding- and lodging-houses about which, however, it would be wise to inquire before making a selection, as they are of varying degrees of excellence and the reverse.

At Port Henderson, on the southern shore of the island, at the entrance to Kingston harbor, there is a saline-calcic spring which is said to possess tonic properties of no mean order and is much resorted to as a bath by convalescents and others from the neighboring districts. There is also a good beach for sea-bathing. There are several buildings here in good order, but the accommodations are not extensive. The place can readily be reached, however, by a steam launch from Kingston in forty-five minutes. No analysis of the water of the spring has ever been published.

The diseases for the climatic treatment of which Jamaica is well suited are bronchitis, catarrhal affections of the respiratory passages, Bright's disease, rheumatism, various forms of dyspepsia, and nervous prostration. All parts of the island are naturally not suitable for the treatment of all these affections, but for each one a locality exists where the patient can find the climate especially adapted to the necessities of his particular disease. Respiratory affections especially do well in this mild and equable climate, as may be judged from the records of one of the life insurance companies doing business on the island, which show that the company lost but one life from diseases of the respiratory organs (bronchitis) during a period of thirty-five years. Patients suffering from these troubles are relieved in almost any part of the island, although there is even here a choice, as cases with scanty expectoration are most benefited in those districts where the atmosphere is most laden with moisture, while those in which there is free or even profuse secretion are more quickly relieved in the neighborhood of Kingston and other parts where the humidity of the air is at a minimum. Patients with nervous prostration receive more benefit from a stay near the seashore than they do in the uplands, and the same is in a measure true of dyspeptics, especially of those in whom the gastric trouble is partly nervous in its origin. Sufferers from Bright's disease do well, as a rule, in all parts of the island, except possibly in the most elevated regions, where in the winter months the thermometer is apt to fall a little too low after the sun goes down, and where, especially on the northern slope, there is at times rather too much rain to be agreeable. The same remarks apply also in the case of rheumatic patients, but the latter would do well to take a course of the waters at one of the numerous mineral springs, of which a few words may be said in closing this article.

There are several medicinal springs in Jamaica, some thermal and others cold, which possess therapeutic properties of no little value, and which are deserving of more careful study by balneologists than they have hitherto received. The most important of these, or at least the best known and the only ones at which passable accommodations for visitors are as yet provided, are the Bath of St. Thomas the Apostle, about a mile from the town of Bath, in the Parish of St. Thomas, the Jamaica Spa, at Silver Hill, in St. Andrew's Parish, and the Milk River Bath at Vere, in the Parish of Clarendon. The first of these is a thermal sulphur, the second a chalybeate, and the third a thermal saline water. All of these springs are quite easily accessible from Kingston.

The limits of this article will not permit of a detailed description of each of these springs. The waters of one or the other of them are of value, taken internally and applied in the form of baths, in the treatment of gout, rheumatism, chronic bronchitis, catarrhal conditions of the stomach and intestines, constipation from abdominal plethora, hepatic and other congestions of the abdominal viscera, amenorrhœa, anæmia and chlorosis, various forms of skin diseases, tertiary syphilitic lesions, and chronic malarial affections. The Government has made grants from time to time for the improvement and care of the buildings at these baths, but there is yet much to be desired in the matter of cuisine, bathing facilities, attendance, and other things that contribute to the comfort and entertainment of the invalid. In the absence of these desiderata they still possess the great advantage that they may be visited in the winter season, when the more pretentious and better equipped spas in Europe and the United States are closed.

There are several lines of steamers running between Jamaica and New York, Boston, Philadelphia, Baltimore, Newport News, and Halifax, the voyage from New York being made in from four to six days. The steamers of the United Fruit Company running from Boston and Philadelphia have excellent accommodations, and service for about forty-five passengers each.

There is usually no lack of amusements in Kingston in the way of horse races, yachting, tennis and cricket matches, etc., and there is also a theatre where performances and concerts are given occasionally during the winter. The roads throughout the island are up to the best English standard and the facilities for riding and driving are unsurpassed. A railroad runs from Kingston in a northwesterly direction to Montego Bay, with a branch line to Anatto Bay and Port Antonio, towns on the north shore, and a spur to Ewarton. Communication with the coast towns is had also by steamers which sail around the island once a week, leaving Kingston every Tuesday. There is frequent mail communication with the United States and Canada, and the island is also connected with this country by cable. Churches of all the leading denominations are found nearly everywhere, and in most of the larger towns are well-appointed clubs, libraries, and social organizations of various sorts.

The best months in which to visit Jamaica are November to April inclusive, as these are the coolest and dryest of the year, but one accustomed to the fierce summer heats of our Northern cities would find a grateful change in the hills of Jamaica even in midsummer.

Much valuable information concerning Jamaica as a health resort may be obtained from a work on "The Climate of Jamaica," by the Hon. J. C. Phillippo, M.D., published by T. & A. Churchill, London, from "The Handbook of Jamaica," published annually in London and Kingston, and from various good guide books recently published.

Jamaica is one of the most beautiful islands of the West Indies both as to the variety and charm of its scenery and the luxuriance of its vegetation; oranges, coffee, the cocoanut, bananas, sugar-cane, and a variety of other tropical fruits grow luxuriantly here. The cultivation and exportation of bananas is now a great industry. The roads, as has been noted above, are hard and white and kept in good repair by the Government, so that one can traverse the island comfortably either by carriage or by bicycle. Whether one skirts the shore with its irregular windings, or seeks the mountainous region of the interior, he will meet not only with a greater variety of climate than is found in any other of the West India islands, but

an infinite variety of attractive scenery. The excellence of the steamers of the United Fruit Company and their swiftness have made an excursion to this island very popular during the winter and spring months. The usual passage from Boston occupies from four to four and a half days.

Thomas Lathrop Stedman.
Revised by *Edward O. Otis.*

JAMBUL.—This is the local name applied to the bark and seeds of *Eugenia Jambolana* Lamarck, a tree belonging to the natural order Myrtaceæ. It is indigenous to tropical Asia and the neighboring islands, where it grows to a large size and bears a crop of edible fruit in July and August. It is also known as rose apple and Java plum. The *Eugenia pimenta*, the common allspice tree, and *Eugenia caryophyllata*, from which cloves are obtained, are both closely allied species. The fruit varies in size from a cherry to a pigeon's egg, and when ripe is olive-shaped, smooth, juicy, and purplish-black in color. It contains a single seed, which is enclosed in a thin, papery shell. All parts of the tree are astringent, and the bark furnishes a beautiful brown dye. The bark is smooth and whitish, and the cell structure contains a number of characteristic pitted cells which are visible to the naked eye. A white crystalline substance has been obtained, termed jamborine, which is tasteless, insoluble in cold water, soluble in alcohol, ether, and chloroform. It is said to possess the active properties of the seeds, but its composition and properties are uncertain. The seeds are cylindrical in shape, about one-third of an inch in length, hard and dry, and almost tasteless. The following analysis of the seeds has been furnished by Mr. Thomas Christie, of London: Essential oil, a trace; chlorophyll and fat, 0.27; resin soluble in alcohol and ether, 0.30; gallic acid, 1.65; albumin, 1.25; coloring matter, 2.70; moisture, 10.0; insoluble residue, 83.73.

The plant is highly esteemed in India for its medicinal properties, and is used by the native physicians in the treatment of many diseases. The sap or juice expressed from the leaves and bark contains the astringent properties of the plant, and when mixed with goat's milk is thought to be particularly beneficent in the intestinal disorders of children. The juice, and an infusion of the bark, are also employed in dysentery and diarrhœa, and in leucorrhœa. A liquor, jambava, is prepared from the fruit by fermentation; it possesses a stimulating and tonic action, and is a favorite beverage of the Hindoos. The most important use of jambul is as a remedy for diabetes, and it is in the treatment of this disease that it has acquired notoriety and attracted the attention of the profession during the past few years. It has long been employed for this purpose in the East, where it has the reputation of producing a rapid and, in many instances, a permanent cure. The quantity of sugar and urine is reduced, the many distressing symptoms are relieved, and a return of health and strength is said to follow its administration. This treatment was brought to the notice of the English physicians in 1883, by Banatvala, a medical officer in the service of the Madras government, and has been the subject of numerous clinical and experimental researches.

Von Mehring and Graser[1] performed an important series of experiments to demonstrate its power to check the production and lessen excretion of sugar. They produced artificial diabetes in animals by the administration of phloridzin, and carefully estimated the amount of sugar excreted when phloridzin was given alone, and when it was given in combination with jambul. The diminution was found to be invariable and very decided. The following figures indicate the results in three experiments:

Sugar excreted without jambul	12.2	10	10
Sugar excreted with jambul	2.1	1	1.5

They also proved that it was devoid of any toxic action, as very large quantities were given without producing any ill effects.

Experiments have also been made to show its inhibitory action on saccharine fermentation by adding it to a solution of starch and malt, and it has been clearly shown that the quantity of sugar is reduced in accordance with the amount of jambul present. In one instance it was found that a solution of rice starch with a definite proportion of malt produced 27.4 parts of sugar; when fifteen grains of jambul were added the amount was reduced to 9.4 parts, and when twenty-five grains were used only 1.3 parts of sugar were formed.

Following the introduction of the drug there appeared a number of reports of cases treated, and in nearly all it was found that the desired effect was produced in a greater or less degree. Among these are reports by such observers as Kingsbury,[2] Saundby,[3] E. H. Fenwick,[4] Mahomed,[5] Egasse,[6] Villy,[7] Lewaschew,[8] Lawrence,[9] and Britto.[10] In some of the cases in which it was used it failed altogether, in others the sugar reappeared immediately the remedy was discontinued, and frequently it would only lessen the symptoms in a slight degree; but the general tenor of the reports is in favor of the remedy. Notwithstanding the favorable reports it has not come into general use, although occasional reports of its successful employment still appear.

The seeds and the bark both possess the antidiabetic action, but the seeds are the more active of the two. A paper presented by Dr. T. Stevenson, of Bombay, to the Pharmaceutical Conference, held at Edinburgh, 1892, states that the fresh seeds, or an extract prepared from the fresh seeds, is the most serviceable and the only certain method of securing the medicinal properties. Under any circumstances, it is recommended that the seeds should be carefully preserved and reduced to powder only as required. Some such variation in the active properties of the drug may account for the uncertainty of its action and the difference in the quantity administered. The usually recommended dose is five to ten grains of the powder, or five to ten minims of the extract, three or four times a day. This, however, appears to be inadequate, and much larger doses are now advised. Dr. Britto, who reports from India his successful treatment of a number of cases, gave it in doses of one drachm of the powder, or one fluidrachm of the extract, three times a day; and Professor Lewaschew, who reports his experience of two years, in which he employed the drug with marked success, advocates it in doses of as much as from 20 to 40 gm. (3 v.–x.) in the twenty-four hours. No toxic action follows its use, but instances of nausea and depression have been reported from its continued use.

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[1] The Lancet, p. 902, 1889.
[2] British Medical Journal, March, 1887.
[3] The Lancet, October, 1887.
[4] *Ibid.*, October, 1888.
[5] London Practitioner, December, 1888.
[6] Bulletin Général de Thérapeutie, July, 1890.
[7] *Ibid.*, January, 1891.
[8] British Medical Journal, March, 1891.
[9] The Medical News, January, 1893.
[10] The Therapeutic Gazette, February, 1893.

JASMINE, YELLOW. SEE GELSEMIUM.

JAUNDICE.—(*Icterus; Morbus regius; Gelbsucht; Ictère*). Jaundice is a syndrome and not a disease, a condition marked by staining of the skin, conjunctivæ, and urine by bile pigment. Since the first formulation of theories by Frerichs and Kuehne, there has been interminable discussion of what may be termed the pathological physiology of jaundice. The liver was long regarded as a separator rather than a producer of bile pigment; given a cause of blood destruction, bilirubin could be formed in the blood stream or in tissues; the hepatic cell might prove unequal to the demands of elimination or its function be suppressed and jaundice resulted. Of late years there has been unity in abandoning such a view, and the paramount importance of the liver cell in the manufacture of bile pigments has been unquestioned. The idea of hæmatogenous jaundice has become obsolete and all

jaundice is regarded as of liver origin. It is true that small amounts of bilirubin may be found in other places than in the liver; bile pigment has been found in apoplectic foci, blood extravasations, and hemorrhagic infarcts in the form of hæmatoidin crystals which are identical with bilirubin. Loewit, in frogs, showed that leucocytes could take up fragments of red cells and elaborate them in different tissues to granules of bile pigment. Naunyn and Minkowski, in the course of their experiments with hæmolytic poisons in geese, demonstrated leucocytes in the liver containing fragments of red corpuscles and granules of bile pigment. Within a few months Croftan, in the course of his experiments on the bile acids, has emphasized anew the extrahepatic origin of bilirubin and of bile acids. Clinically the facts are of no import. The experiments of Kunde and Moleschott with cold-blooded animals, of Stern with pigeons, of Naunyn and Minkowski with geese, have shown conclusively that it is the liver cell above all that is concerned in the elaboration of bilirubin from hæmoglobin.

Practically every icterus is an icterus from absorption of bile from the liver. Without liver function there is no icterus. The mechanism of absorption is plain in the jaundice termed obstructive or mechanical, the jaundice of stasis, "ascending jaundice"; stasis in the ducts overcomes the pressure of the bile secretion (not more than 200 mm. of water), bile is secreted at higher pressure and passes from the intercellular duct to the lymphatic vessels near the bile capillaries, thence to the larger lymphatics, thoracic duct, and to the blood stream. The liver cells are continuous with the walls of the bile capillaries, and Kuppfer has demonstrated prolongations of the capillaries even within the liver cell. It is possible under certain conditions that functionally disordered liver cells may send bile to the blood capillaries and not to the bile ducts, or may allow passage of bile from the ducts back to the blood-vessels and not to the lymphatics. This is the so-called parapedesis of bile (Minkowski), diffusion icterus (Liebermeister), paracholia (E. Pick).

The investigations of Charcot, Legg, and others have broadened our views of mechanical jaundice. Under the influence of increased hæmolysis from toxic or infectious cause, excess of hæmoglobin is brought to the liver and elaborated into bile. There is increase in quantity of bile, but particularly an increase in viscidity and pigments, a polycholia and particularly a pleiochromia. This thick, viscid bile leads to stasis in the small bile channels, to irritation and swelling of the mucosa, to obstruction and to icterus by absorption; again an icterus of obstruction, but a descending rather than an ascending icterus. Even without increased amount of viscidity of bile, the eliminated poisons in course of an intoxication or infection may lead to catarrh of the bile terminals, to swelling with mechanical blocking and absorption. Though all cases of jaundice may be classed as obstructive, the classification of Hunter is a convenient one for descriptive purposes.

I. Obstructive Jaundice.—Causes acting from within or without the bile ducts. The obstruction is obviously mechanical and independent of changes in the blood or bile. The following is substantially the table of Murchison:

A. Obstruction by Foreign Bodies within the Duct.
1. Gall stones, inspissated bile, blood clot.
2. Foreign bodies from the intestines.
3. Parasites—hydatids, distomata, lumbricoids.

B. Obstruction by Catarrhal Swelling of Large or Small Ducts.

C. Obstruction by Stricture or Obliteration of Ducts.
1. Congenital deficiency or stricture of ducts.
2. Stricture from perihepatitis, from ulcer of the duodenum, from ulcers or scars in the bile ducts.
3. Spasmodic stricture (icterus psychicus).

D. Obstruction by Tumors at the Papilla or of the Bile Ducts.
Fibroma, lipoma, gumma, papilloma, xanthoma, sarcoma, carcinoma.

E. Obstruction by Pressure from without.
(1) Tumors of the liver; (2) tumors of the gall bladder; (3) enlarged glands in the fissure of the liver; (4) tumors of the stomach or duodenum; (5) tumors of the pancreas; (6) tumors of the kidney; (7) floating kidney; (8) omental tumors; (9) retroperitoneal tumors; (10) aneurisms of abdominal aorta, hepatic artery; (11) fæcal tumors, especially of the hepatic flexure; (12) pregnant uterus, tumors of the uterus; (13) ovarian tumors.

II. Toxæmic Jaundice.—Jaundice dependent on changes in the blood and bile; the end cause is obstruction dependent on increased viscidity of bile or on catarrhal swelling of the bile ducts. This is the group formerly called hæmatogenous. Hunter classifies causes as follows:

1. *Definite Poisons.*—Phosphorus, arsenic, toluylendiamin, snake venom.

2. *Poisons of Infectious Fevers.*—Yellow fever, malaria, pyæmia, typhus, typhoid, relapsing fever, scarlatina, pneumonia.

3. *Special Icterogenic Poisons.*—These are of probable infective nature. Various names have been given to the jaundice, as epidemic, infectious, febrile, malignant, septic, Weil's disease, icterus typhosus, icterus gravis, acute yellow atrophy of the liver.

Symptoms. I. *Obstructive Jundice.*—1. Staining of the tissues is most striking and is due to bilirubin. Connective tissue has particular affinity for the pigment. The conjunctivæ usually show the earliest tinge; the color is well seen in the mucous membrane of the hard palate, especially on pressure; color of the skin varies from sulphur, lemon, or saffron hue in slight cases to greenish, bronze, or even greenish-black in chronic cases with complete obstruction. The pigmentation is most marked over the forehead, temples, scalp, upper extremities, and thorax. The pigment lies in granular masses in the deepest layers of the rete Malpighii, and may persist ten or twenty days after it has disappeared from the blood. The cornea, peripheral nerves, cartilage, hair, and teeth escape stain; the brain is not colored, except in the newborn; the fœtus may be lightly jaundiced. 2. Nearly all secretions show presence of bilirubin. It can be demonstrated in the urine, sweat, exudates, amniotic fluid, and pus; it is inconstant in the milk, rarely present in the sputum except in pneumonia, has been demonstrated exceptionally in saliva, but is not found in the tears. The urine is usually dark yellow or brown, sometimes reddish or greenish. The foam is yellow, immersed filter paper is stained yellow, and the presence of bilirubin can be shown by a number of tests. In the Smith-Rosin test, 3 c.c. of a solution of tincture of iodine diluted ten times with alcohol is added to 10 c.c. of urine; a green ring forms at the zone of contact. Gmelin's test: Fuming nitric acid is poured beneath a layer of urine in a conical glass; a play of colors occurs at the zone of contact—yellow, green, blue, violet, to red; the green color is most characteristic. The Schwerdtfeger-Huppert and Gluzinski tests are equally delicate but less convenient. If the serum contains only slight quantities of bile pigments, the urine may contain only urobilin and no bilirubin. The urine is yellowish-red and only rarely brownish-red. Urobilin occurs in small quantity in normal urine, occurs in the fæces as stercobilin, may occur alone in the urine in slight jaundice, at the beginning or end of severe jaundice, usually disappears from the urine when bile is totally shut off from the intestine. It is a reduction product of bilirubin or hæmoglobin, and reduction may occur either in the intestine or in the tissues. There is no true urobilin icterus; the staining of the skin is always by bilirubin. To test for urobilin, water is poured carefully over the urine in a test tube; urobilin diffuses more rapidly than bilirubin, and may be recognized with the spectroscope (Hayem). The following table of Quincke, little modified from that of Hayem and Tissier, shows the shifting relations of the bile pigments in urine, fæces, and skin in the course of ordinary obstructive jaundice: