

rule is not so free from exception, yet a second attack is a very infrequent occurrence. This rule applies to Roetheln. As yet there are few, if any, authentic records of second attacks. But when the question of mutual protection, which would be a *sine qua non* to the supposition of identity, is considered, the most conclusive evidence of its absence is presented.

Of J. Lewis Smith's 48 cases, 19 had had measles, and 1 contracted the disease subsequently. Of Shuttleworth's 30 cases, more than half had had measles, and 4 scarlatina. In one case the patient had measles five months, and scarlatina one month, before. In 13 of the cases, in which subsequent observation was possible, 7 contracted measles and 6 scarlatina after the lapse of a few years. Goodhart observed that 39 out of 63 cases had had measles.

Instances might be multiplied to a very large number, but it is unnecessary; for the non-existence of mutual protection is too well established to admit of doubt. There is, however, another aspect of this question, or, rather, another explanation of the facts, which has been presented with considerable appearance of probability. It is that Roetheln is simply the modification of measles presented in second attacks, bearing the same relative position that varioloid does to smallpox. There are two reasons for regarding this position as untenable. The first is, that pronounced attacks of true measles have, in a large number of instances, followed, and not preceded, Roetheln, and these cases have presented no modification in kind or severity of the symptoms which go to make up the clinical history of measles. This applies with equal force to scarlatina. The second reason is, that in the individuals who have been the subjects of second attacks of measles, the symptoms have been as uniform and pronounced as in the first.

On the contrary, a much closer analogy can be traced between smallpox and varicella on the one hand, and measles and Roetheln on the other. The ratio is much the same in regard to corresponding severity, and in similarity of appearance of the eruption.

The final separation, in the minds of medical men, of the former pair from each other was beset by the same uncertainties as that of the latter.

Another fact of significance is that Roetheln occurs in epidemics, when neither scarlatina nor measles is prevailing; and, in the same epidemic, most of the cases will be rubeoloid, and a smaller number scarlatinoid.

Text-book descriptions of measles commonly refer to a variety of the disease under the designation of "rubeola sine catarrho," this name indicating a condition in which there is fever, with an eruption similar to that of ordinary measles, and at the same time absence of the inflammation of the respiratory apparatus. Perhaps it is fair to regard these as cases of Roetheln; and a significant observation made by Watson, in his "Practice of Medicine," gives support to this view. He says: "It is observed that rubeola sine catarrho confers no protection against recurrence—is commonly succeeded by an attack of measles in its true form." Meigs and Pepper make the same observation as to their experience.

To summarize, the points demonstrating the non-identity of Roetheln with measles or scarlatina are:

1. The difference in clinical history.
2. Absence of mutual protection.
3. Absence of modification in second attacks of those two diseases.
4. Occurrence of epidemics while the other two are not prevailing.
5. In any epidemic, resemblance of some of the cases to one, and of some to the other, of the two diseases.

A further differentiation of the two varieties into two distinct diseases is possible; but it would be a refinement almost beyond our present powers of observation.

DIAGNOSIS.—The diagnosis is principally made by process of exclusion, because, at the outset, the presence of scarlatina or measles is generally suspected. From scarlatina at the outset, or in the first day or two of sickness, in certain mild cases, the points of difference are:

In Roetheln, the absence of, or presence in a milder degree, of sore throat; the absence of the strawberry tongue, and the existence of a whitish coating if any change be present; the absence of continuity of the eruption; and the presence of post-cervical adenitis, the glands at the angle of the jaw being unaffected. After the lapse of two or three days the course of the eruption in Roetheln is to reach its maximum and begin to disappear quickly, and the desquamation, when perceptible, is fine, and not in flakes or patches of some size.

Pronounced cases of scarlatina do not resemble Roetheln sufficiently to render the diagnosis uncertain.

From measles the discrimination is to be based mainly on the absence of the stage of fever with catarrh preceding the eruption, or its very mild character and shorter duration. The cervical adenitis has much weight, though it is not absolutely conclusive. Though the rash may very closely resemble that of measles, yet the papules are less elevated, smaller, less aggregated, less decidedly rose-colored, and run their course more quickly—desquamation setting in two or three days before it would be likely to occur in measles.

Subjoined is a comparative table of these three diseases in their different stages, giving also the average duration of each stage:

ROETHELN.	SCARLATINA.	MEASLES.
	<i>Stage I.—Incubation.</i>	
Duration, six to twenty-one days.	Two to fourteen days.	Twelve to fifteen days.
Inconstant.	Constant.
	<i>Stage II.—Invasion.</i>	
One day or less. Often absent.	Less than one day. Never absent.	Two to four days. Never absent.
Malaise, slight.	Vomiting.	
Sore throat and lachrymation.	Decided sore throat.	Drowsiness, cough, coryza, conjunctivitis, photophobia.
Cervical adenitis.		
Temperature, 99°-100°	Temperature, 103° +.	Temperature, 102° +.
	<i>Stage III.—Eruption.</i>	
Three days. Begins on face or chest.	Six to eight days. Begins on chest.	Four to five days. Begins on face.
Papular, slightly. Pale rose, or darker and brownish.	Macular. Deep-red scarlet.	Papular, decidedly. Rose.
Not continuous. Ceases spreading in one or two days.	Continuous. Ceases spreading in three or four days.	Not continuous. Ceases spreading in two or three days.
No stationary period.	Stationary period of two to three days.	Stationary period of two to three days.
Burning or itching, slight.	Burning, often great.	Burning and itching, decided.
	<i>Stage IV.—Desquamation.</i>	
Very slight and fine.	In scales of quite large size.	Furfuraceous, and often not pronounced.
Overlaps stage of eruption.	Preceded by stationary period.	Preceded by stationary period.
Last two or three days.	Lasts ten days, and sometimes longer.	Lasts about four days.
		Leaves dull-colored stains.
	<i>Complications.</i>	
None characteristic.	Acute form of Bright's disease.	Bronchitis.
	Rheumatism.	Pneumonia.
	Otorrhoea, and necrosis of temporal bone.	Tuberculosis.
		Inflammation of the intestines.

In addition to these other exanthemata, certain simple skin diseases must be considered in the diagnosis. Sometimes the eruption of miliaria papulosa (prickly heat) resembles that of Roetheln; but it occurs in well-defined patches of several inches in diameter, is associated with unusual sweating, and lasts many days longer. Also, there are no febrile and constitutional symptoms accompanying miliaria, and the itching is usually great.

The most careful investigation possible into the origin or sources of contagion should be made; and in cases of

doubt a positive diagnosis should be withheld for one or two days. It may be advisable to explain the uncertainties, and to adopt the precautions as to isolation, etc., necessary in scarlatina.

COMPLICATIONS.—Complications or sequelæ characteristic of the disease do not exist. A condition of transient albuminuria is spoken of, but it is not indicative of renal disease. After the rash disappears we may expect to find the usual condition of health present. The prognosis is therefore good.

TREATMENT.—Because of the mildness of the disease there is generally nothing called for in the matter of medication—simple restriction of diet and avoidance of exposure during the continuance of the elevated temperature being all that is necessary. Practically the interest and importance attaching to Roetheln lie in recognizing it as a separate disease, and in the exclusion of the more serious affections, scarlatina and measles.

BIBLIOGRAPHY.—Besides the treatises of Meigs and Pepper, J. Lewis Smith, Vogel, Day, Goodhart, Eustace Smith, and Ellis, on "Diseases of Children"; those of Bristowe, Bartholow, Loomis, Aitkin, and Flint, on the "Practice of Medicine"; and DaCosta's work on "Medical Diagnosis," the following articles may be mentioned: Hardaway, in "Pepper's System of Medicine"; Harts-horne, in "Reynolds' System of Medicine"; Thomas, in "Ziemssen's Cyclopædia"; Cheadle, Shuttleworth, and Squire, in the *Trans. Internat. Med. Cong.*, 1881; Griffith, in the *New York Medical Record*, July 2d and 9th, 1887; Edwards, in the *Am. Jour. Med. Sci.*, 1884; Jones, *Boston Med. Journ.*, 1881; Sholl, *Med. and Surg. Reporter*, 1882; T. D. Swift, *N. Y. Medical Journal*, November 27th, 1886; Harrison, *Am. Journ. Obstet.*, 1885; Duckworth, Erskine, and Gowers, in *London Lancet*, 1880; Dukes, *ibid.*, 1881; Yonge-Smith, *ibid.*, 1888 and 1886; Strover and Jaccoud, *ibid.*, 1886; Shuttleworth, Brown, Burnie, Davis, Rooke, and Wilson, in *Brit. Med. Journal*, 1880; Byers and Sadell, *ibid.*, 1881; Lawrence, *ibid.*, 1882; Shackleton and Cullingworth, *ibid.*, 1883; McLeod, *ibid.*, 1885; and Ryle, *ibid.*, 1886.

Thomas D. Swift.



FIG. 4137.—*Rosmarinus officinalis*; flowering branch. (Ballou.)

ROSEMARY.—*Rosmarinus officinalis* L. (Fam. Labiate). U. S. P. 1880. The dried leaves of *Rosmarinus officinalis* L. Fam. Labiate.

These leaves are obtained from a small, slender, evergreen, blue-flowered shrub, native of the Mediterranean region, and somewhat cultivated for medicinal purposes and as a decorative shrub. The flowering twigs are also sometimes employed. The leaves are about 2.5 cm. (1 in.) long, oblong, but so strongly recurved at the edges as to appear linear in the dried condition, obtuse at both ends, destitute of a petiole, entire, coriaceous, dark-green with a slight bluish cast above, and grayish-green and densely woolly and glandular underneath. The odor is characteristic

and somewhat camphoraceous, the taste aromatic, pungent, and somewhat terebinthinate. Although the use of the drug has now largely been superseded by that of its one or two per cent. of volatile oil, the action is not quite the same in both of them, since the drug itself also contains considerable tannin and resin and a little bitter substance. The latter, therefore, is a useful aromatic bitter and tonic. The fresh decoction, or the fluid extract, applied to unhealthy wounds, is a good vulnerary, though somewhat irritating unless carefully employed. The dose of rosemary is 0.5-1 gm. (gr. vij.-xv.)

Oil of Rosemary (*Oleum Rosmarini*, U. S. P.) presents the appearance of a colorless or at most a pale yellow fluid, has a specific gravity of from 0.895 to 0.915, is freely soluble in alcohol, and possesses the characteristic odor of the drug and a similar and somewhat camphoraceous taste. It contains cineol, borneol, and camphor, with other less important substances. It possesses all the activity of the drug, but in an intensified degree. It is often given internally as a carminative and general intestinal stimulant, though its use has greatly declined. The dose is from one to five minims. It enters into the compound tincture of lavender. Owing to its actively local stimulant or irritant properties, it is considerably used as a local application for promoting the nutrition of the skin and also as a vulnerary. *Henry H. Rusby.*

ROSEOLA.—Roseola is often incorrectly used as synonymous with rubella or Roetheln. Unquestionably many efflorescences which have been called roseola are in fact the efflorescences of rubella, and the reverse is quite true, that many of the reported cases of rubella are nothing more nor less than roseola. When properly used, the word roseola should simply indicate a rose-colored rash, a form of erythema, and should not be spoken of as a specific disease.

A roseolous efflorescence may often precede the appearance of the exanthemata of rubella, scarlet fever, measles, variola, and vaccinia, but should not be confounded with the specific efflorescences which are characteristic of these affections, and which usually occur later in the course of the disease. A roseolous rash may also occur in other conditions such as cholera, typhoid, diphtheria, and malaria—in fact, in almost any condition which gives rise to fever. If the word is to be used at all, one should designate the disease accompanying it, as, for instance, "roseola syphilitica," "roseola vaccinia," "roseola febrilis," "roseola typhosa," etc., but the tendency is to drop the term entirely from medical nomenclature.

Whereas the roseolous erythema may closely resemble the efflorescence of rubella, measles, or scarlet fever, it has the following points of distinction: It is neither contagious nor epidemic; there are no characteristic prodromal symptoms; it is not confined to any special portion of the body; there is either no fever at all, or, if the fever be present, it does not run a characteristic course; it may last a few hours, or it may disappear after a few days without desquamation; the erythematous areas are not so crescentic as in measles nor so tumefact as in scarlet fever.

A roseolous rash is very common in infants and in children as a result of dentition, gastric or intestinal disturbances, or in connection with the many febriculae seen in early life, for which no sufficient cause can be found. Again, it may occur in infants who are in perfect health, and in whom nothing else abnormal may be detected. It is in these special cases that the term "roseola infantilis" has been used. *Maynard Ladd.*

ROSES.—The genus *Rosa* L. (fam. *Rosaceæ*) comprises upward of a hundred species of prickly shrubs. Although of little medicinal value, strictly speaking, these species contribute several articles possessing important uses in flavoring, perfuming, and coloring and exerting a mild stimulant, antispasmodic or tonic action. Three of these articles are official, as follows: *Rosa Gallica* or *Red Rose*, "the petals of *Rosa Gallica* L., collected before expanding."

Rosa Centifolia, White Rose, Pale Rose, or Hundred-leaved Rose, "the petals of *Rosa centifolia* L."

Oleum Rosa, Oil of Rose, Otto or Attar of Rose, "a volatile oil distilled from the fresh flowers of *Rosa Damascena* Miller."

Although the red rose plant is native in Europe and adjacent Asia, the official product is obtained wholly from cultivated plants, chiefly in Southern and Central Europe, especially in France. The peculiar structure of the flower renders it quite an easy matter to collect the cones of unexpanded petals. The calyx lobes, having spread backward before the opening of this cone, a sharp knife is drawn about the base of the latter, which is then lifted off, leaving the stamens still attached to the rim of the calyx tube. The cones are then very carefully dried in the shade, or they may be packed in salt. In the finest grades they mostly cohere in the cone, though loose petals may also be of fine quality. They should preserve a deep purple-red color and a fine velvety surface, as well as a strong and fine rose odor. The taste is bitterish, astringent, and very slightly acrid. The individual petals have a roundish outline, a notched summit, and a very short, broad, yellowish-white basal claw. Fragrant as they are, the amount of volatile oil in them is minute. The important constituent is a beautiful bright red, readily soluble coloring matter. Mildly astringent properties are imparted by a small amount of gallic acid. Small amounts of fat and quercitrin also exist. Red rose is practically inactive, though a sentimental effect is often gained by administering it in mild cases of hysteria. The Pharmacopœia provides a fluid extract, made with diluted alcohol and 10 per cent. of glycerin, and a confection consisting of 8 per cent. of the No. 60 powder, 64 per cent. of sugar, 12 per cent. of clarified honey, and 16 per cent. of stronger rose water. There is an official 12.5 per cent. syrup of the fluid extract. Red rose also enters into the pills of aloes and mastiche. There is, of course, no particular dose.

White rose is native of Western Asia, and is believed by some to be a mere variety of the red. Its constituents are identical with those of red rose except that the amount of coloring matter is extremely small. The use of this drug is therefore restricted almost wholly to flavoring. It is likely to be dropped from the next edition of the Pharmacopœia.

Rosa Damascena, the Damascus rose, is cultivated for the production of rose oil, chiefly in Bulgaria. This oil, being then exported and repacked in other countries, becomes the chief source of the various commercial brands bearing other geographical names, although a moderate amount of this product is actually distilled from roses grown in other countries. The oil is simply distilled with water. The following is the official description:

"A pale yellowish, transparent liquid, having the strong, fragrant odor of rose, and a mild, slightly sweetish taste.

"Specific gravity: 0.865 to 0.880 at 20° C. (68° F.).

"It is but slightly soluble in alcohol, and neutral to litmus paper moistened with alcohol.

"The congealing and melting points of the oil are subject to some variation, depending upon the amount of stearopten, but, when slowly cooled to a temperature usually between 16° and 21° C. (60.8° and 69.8° F.), it becomes a transparent solid, interspersed with numerous slender, shining, iridescent, scale-like crystals. Upon the application of the heat of the hand, the crystals should float in the upper portion of the liquefied oil.

"If to five drops of the oil, contained in a test tube, five drops of concentrated sulphuric acid be added, a reddish-brown, thick mixture will be produced, but no white fumes or tarry odor should be developed, and the fragrant odor of the oil should not be destroyed. If this mixture be then shaken with 2 c.c. of alcohol, the resulting liquid may be turbid, but should be nearly colorless, and should not at once assume a red or reddish-brown color (absence of oil of ginger-grass or Turkish oil of geranium, from *Andropogon Schœnanthus* L. [Fam. Grami-

neæ], and of oil of rose geranium, from *Pelargonium Radula* [Cavanilles] Aiton, *Pelargonium capitatum* Aiton, and *Pelargonium odoratissimum* [L.] Aiton; Fam. Geraniaceæ)."

The important odorous constituent of rose oil is geraniol, long regarded as a distinct substance under the name "rhodinol." There is also a small quantity of citronellol. Various derivatives of these also occur.

Although rose oil undoubtedly has antispasmodic and stimulant properties, practically its entire use is for perfuming and flavoring.

Official rose water may be regarded as indirectly a preparation of rose oil, although not prepared from that substance. It is recognized under two titles, namely, *Aqua Rosa*, or *Rose Water*, and *Aqua Rosæ Fortior*, or *Stronger Rose Water*. The latter is the water, saturated with the oil, obtained as a by-product in the distillation of rose oil. The former is made by mixing, immediately when required for use, equal volumes of the stronger rose water and distilled water. From stronger rose water is prepared the *Ointment of Rose Water* or *Cold Cream* (*Unguentum Aquæ Rosæ*, U. S. P.), made with 12.5 per cent. of spermaceti, 12 per cent. of white wax, 60 per cent. of expressed oil of almond, 19 per cent. of stronger rose water, and 0.5 of 1 per cent. of sodium borate, these figures being approximate, since part of them respond to weights, part to measures.

In addition to the above official products, there is used in Europe, and there to only a very slight extent, a confection made from the fruits of *Rosa canina* L., the dog rose. This fruit contains only sugar, malic and tannic acids, and their compounds, and is a very inferior preparation.

Rosaceæ.—This great family includes several subfamilies regarded by many botanists as themselves entitled to family rank (*Pomaceæ*, the apple family; *Drupaceæ*, the plum family, etc.). Thus considered, it is doubtless the most important fruit-producing family, yielding raspberries, blackberries, strawberries, plums, peaches, cherries, and similar stone fruits, the apple, pear, quince, medlar, etc. From a medicinal point of view, the family is of considerable importance, yielding the almonds, wild cherry, North American ipecac, koosso, prune, quillaja, blackberry bark and the roses, all elsewhere considered, besides a number of minor drugs, several of which are considered below.

Raspberry, or *Rubus Idæus*, U. S. P., is the fruit of *Rubus Idæus* L., the cultivated red raspberry of European nativity. The Pharmacopœia provides that the American wild red raspberry (*R. strigosus* Mx.) or the black cap (*R. occidentalis* L.) may be employed in the absence of *R. Idæus*. This fruit contains only sugar, fruit acids, and their salts, like others of its class, and its medicinal properties are merely those of a mild laxative, refrigerant, and antiscorbutic. Its fine flavor and beautiful red color make it a very useful adjuvant or vehicle, and an official syrup of the fresh fruit is provided for this purpose. Although not official, a similar syrup made of strawberries is in common use.

ASTRINGENT DRUGS.—Probably the most common and important property of the drugs of the rose family is their astringency, due to the presence in them of considerable quantities of tannin. In such products as the leaves of the blackberry, raspberry, and strawberry, this tannin is accompanied by appreciable quantities of gum, thus favorably modifying the action, and these are very largely employed as domestic astringents. *Tormentilla*, the rhizome of *Potentilla Tormentilla* L., as well as the rhizomes of other species of *Potentilla*, contains about the same amount of tannin as geranium, and is similarly employed. The same is true of *Sanguisorba* and of various species of *Acæna*, and of the root and bark of several species of *Spiræa*, *Hardhack*, or *Steeple Bush*, the leaves being also employed like those of the strawberry and raspberry. Under the names *Meadow Sweet*, *Queen of the Meadow*, and *Ulmaria*, the leaves of *Spiræa Ulmaria* L. are also employed in the same way.

Henry H. Rusby.

ROSSCOMMON SPRING.—Monroe County, Pennsylvania.

POST-OFFICE.—Wind Gap. Hotel.
ACCESS.—From Philadelphia via Reading Railroad; from New York via Central Railroad of New Jersey. The Rossccommon depot is only a few hundred feet from the hotel.

The summer resort known as Rossccommon is situated in the Wind Gap of the Blue Ridge Mountains, on the north incline of the range, one thousand feet above tide water. The location is fifteen miles west of the Delaware Water Gap, twelve miles from Stroudsburg, and fifteen miles from Easton. The hotel, known as the Rossccommon Inn, is situated on a handsome plateau, half a mile square, and surrounded by forests. The neighborhood is entirely free from malaria and mosquitoes, and a fine breeze prevails almost constantly; hence the name Wind Gap. The accommodations at the inn are plain and unpretentious, but very comfortable and home-like. The spring, discovered a few years ago, adds considerably to the attractions of the place. The water flows from a fissure in the rock at the bottom of the spring, and constantly discharges a large volume of carbonic acid gas. It was analyzed in 1887 by Prof. William H. Chandler, of the Lehigh University, with the following result:

Neutral (lightly carbonated). One United States gallon contains: Sodium chloride, gr. 0.08; sodium sulphate, gr. 0.09; potassium sulphate, gr. 0.05; magnesium sulphate, gr. 0.02; calcium carbonate, gr. 0.39; magnesium carbonate, gr. 0.10; silica, gr. 0.47; iron carbonate, a trace. Total solids, gr. 1.20. Carbonic-acid gas (free and partially free), 1.42 cubic inches.

This analysis does not present a mineral water in the strict acceptance of the term. It is probable that very few common potable waters would show so light a mineralization; yet it is entirely free from organic matter, and has sufficient gas to give it a bright sparkle and to render it very palatable. The water is bottled and sold.

James K. Crook.

ROYAL GORGE HOT SPRINGS.—Fremont County, Colorado.

POST-OFFICE.—Canyon City. Hotel.
ACCESS.—From Denver via Denver and Rio Grande Railroad. Canyon City is also the western terminus of the Arkansas Valley branch of the Atchison, Topeka, and Santa Fé Railroad.

The town of Canyon City, with a population of thirty-five hundred inhabitants, is rapidly becoming a charming city of healthful and comfortable homes. It is the county seat of Fremont County, and is situated on the north and south banks of the Arkansas River, one hundred and sixty miles south by west of Denver, and one hundred miles below Leadville. The scenery about the place is grand and romantic to a high degree. A walk of a few minutes takes the tourist to the famous Royal Gorge, where the granite cliffs tower 2,000 feet above the head. The altitude of the springs is 5,200 feet above the sea-level. The location is protected by the mountains on three sides, and the report of the United State Meteorological Bureau shows that for any given month in winter the temperature on an average is six degrees warmer than at any other point in the State. The rainfall is only fourteen inches per annum, and it is said that there are over three hundred sunny days in every year. The capacity of the hot springs is difficult to estimate, as they break out into the Arkansas River in several places. One of them, which issues from the earth a little above low water, yields fifteen gallons per minute, but the combined flow of the springs would be many times greater. Within half a mile of the hot springs are cold soda and iron springs. Excellent bathing facilities have recently been provided at the hot springs. The following analyses are by Prof. Oscar Loew, of the United States Geological Survey. That of the Royal Gorge Hot Springs shows that one United States gallon contains: Sodium carbonate, gr. 73.20; magnesium carbonate, gr. 12.80; calcium carbonate, gr. 33.50; sodium sulphate,

gr. 79.30; sodium chloride, gr. 18.20; lithium chloride, a trace. Total, 217 grains. Temperature of water, 102° F. The analyses of the Royal Gorge Cold Soda and Iron Springs show that one United States gallon contains:

Solids.	Iron Duke. Grains.	Little Ute. Grains.
Sodium chloride	83.00	118.00
Sodium sulphate	12.20	12.10
Sodium carbonate	76.80	76.40
Calcium carbonate	33.00	22.50
Magnesium carbonate	14.60	14.00
Iron	Traces.	Traces.
Lithia	Traces.	Traces.
Total	219.60	243.00

The waters of both cold and hot springs are highly charged with carbonic acid gas. The hot baths here are strongly recommended for rheumatism and skin diseases. Dr. Prentiss, of Canyon City, informs us that persons suffering from pulmonary trouble are usually much improved by a sojourn in the sunny, even climate of this region.

James K. Crook.

ROYAT-LES-BAINS, FRANCE.—This well-known French spa is situated in the centre of France, being one of a group of mineral-spring resorts in this region of the Auvergne Mountains. Not far distant are Mont Dore, La Bourboule, Chatel Guyon, Vichy, and others.

Royat, a small town of 1,528 inhabitants, is beautifully situated in a narrow valley watered by the Tretaine, and surrounded by the lower Auvergne Mountains. All the surrounding country is charming, and there are many most attractive excursions, particularly to the Puy de Dôme, where an extensive and grand view is obtained. This resort has been called the "Ems" of France, but in climate, picturesqueness, and charm of situation it is far superior to the German spa.

The climate exhibits the characteristics of a mountain climate of moderate elevation, the altitude being 1,475 feet. There are sudden transitions of temperature; sudden storms of wind and rain with thunder; a dry atmosphere; and brilliant sunshine. The soil is volcanic, and the dust from such a soil is abundant and blown about in clouds by the wind. The peculiar situation of Royat itself, as Yeo says ("Health Resorts," J. Burney Yeo), also modifies the climate. "Lying as it does in the floor of a somewhat narrow valley, surrounded on all sides by mountains, and open only to the east, running, moreover, in a direction east and west, and facing the east, it is particularly exposed to the direct heat of the sun." "It is therefore," continues Yeo, "exceedingly difficult to find any kind of shady walks in the immediate vicinity of Royat when the sun is up and the sky is cloudless." Therapeutically the climate is invigorating and refreshing.

The waters are what are known as "warm muriated alkaline," containing bicarbonates of soda, potash, lime, and magnesia, together with chloride of sodium and a small amount of lithia. Arsenic in very minute quantity is also found in these waters, as are also the salts of iron and manganese. All the springs are rich in free carbonic acid gas. The natural temperature of the water is from 68° to 95° F. In this country the Healing Springs of Virginia and the Hot Springs of North Carolina are somewhat similar in their composition and uses. There are four principal sources: the Eugénie, St. Mart, Cæsar, and St. Victor. The Eugénie is the warmest (95.9° F.), and is the most highly mineralized. The St. Victor contains the most iron and arsenic. These springs together furnish 1,522,000 litres of water a day. The water is clear and transparent, and has no odor.

The waters of Royat are employed for drinking, bathing, gargling, and inhalation. The bathing establishment is complete, and said to be one of the finest in France. A specialty of this spa is the running water bath, where the water is led directly from its source and at its natural temperature into the bathtub, and con-

stantly flows in and out. There are arrangements for douches with massage attached to each bath, and also independent apparatus for douches of various forms. There are inhalation rooms; facilities for gargling, irrigation, and pulverization; baths and douches of water charged with carbonic acid gas; hydro-electric baths; a large public swimming bath; and a gymnasium.

The chief drinking fountain is from the Eugénie Spring, and is situated in a pleasant park. The water is very agreeable to drink. There are two casinos with music, concerts, balls, and theatrical performances. "The excursions," says Yeo (*loc. cit.*), "are numerous, varied, and interesting; for no more remarkable country to the geologist, the naturalist, and the archæologist can be found than this great mountainous district of extinct volcanoes, old mediæval towns, historic churches, and Roman and even earlier remains."

The accommodations are abundant, good, and of reasonable price. Although open throughout the year, the season is from the 15th of May to the 15th of October.

Royat is about nine hours distant from Paris via Clermont-Ferrand, which is fifteen minutes distant from Royat.

The disorders for which these waters are of value are chiefly arthritic and anæmic affections. Rheumatism; gout associated with anæmia; skin diseases, such as eczema, acne, and pityriasis; chronic laryngitis and bronchitis; bronchial asthma; neuralgia; sciatica; atonic dyspepsia; various uterine affections; gouty glycosuria; biliary and renal lithiasis; neurasthenia; and various forms of anæmia are all treated here. The contraindications are organic cardiac affections, a tendency to hemorrhage, organic affections of the central nervous system, scrofula, and other tuberculous affections.

For the after-treatment the seaside for a short time is recommended, except in joint and bronchial affections, for which a winter in the south of France is preferred.

Not far from Royat is Durtol, 1,705 feet high, where is a sanatorium, opened in 1898.

For a further consideration of this resort, as well as others in France, the reader is referred to "Stations Hydro-Minérales, Climatériques, et Maritimes de la France," Paris, 1900. *Eduard O. Otis.*

RUBBER.—*Elastica*, U. S. P. *Caoutchouc*, Fr. Cod.; *India rubber*, *Gum elastic*, etc. The concrete milk juice of several species of *Hevea*, Aubl. (fam. *Euphorbiaceae*), known in commerce as *Para rubber*.

From a commercial standpoint, the substance bearing the above names is derived from a large number of milky-juiced plants, growing in the tropics of both the Old and the New World, these plants belonging to many and distantly related families, but more especially, in the order named, to the *Euphorbiaceae*, *Urticaceae*, *Apocynaceae*, and *Asclepiadaceae*. Besides these, which yield rubber on a commercial scale, the substance caoutchouc occurs in small amounts in a very large number of milk juices.

The rubbers from these different botanical sources naturally differ widely in appearance and quality. Some of them—perhaps more because of the manner in which the milk juices are treated than because of natural differences in the latter, they being often mixed with ashes, soap, and other substances, and allowed to ferment in holes in the ground—are quite unfit for official use. Others, though clean, and not, strictly speaking, objectionable, are inferior from the standpoint of deficiency in their useful properties. *Para rubber* has been selected for official purposes because of its cleanliness, purity as caoutchouc, high elasticity, durability, and ready solubility in appropriate liquids.

ORIGIN.—The plants yielding *Para rubber* are large trees, frequently exceeding a hundred feet in height and five or six feet in diameter, growing in the valleys of the Amazon and its tributaries. The basin of the Madeira and its tributaries produces the largest amount. Though mostly exported via *Para*, whence the name, much of the same grade comes out through the west coast of South America. The milk juice is obtained by gently tapping

the outer and middle bark layers with a sharp pick and catching the exudation in small cups attached to the trees. The milk is then gathered and carried to the smoking stations, where it is coagulated in successive layers upon a flat wooden paddle, by being held in the smoke of smothered fires, special articles being preferred for this fuel. When a suitable quantity has been gathered upon the paddle, an incision is made at the upper end of the mass, called a *bolacho* or "bottle," to permit of its being slipped off from the end of the paddle. It then possesses a flat form, a whitish color, and smooth surface, and may weigh from a few up to seventy-five pounds, or even more. The product of the upper tributaries is usually in *bolachos* of about twenty-five pounds, the larger *bolachos* coming mostly from the lower Madeira. The rubber soon begins to turn yellow, then brown, and ultimately black, first upon the surface and then gradually toward the interior, the complete process of darkening requiring several years. At the same time it loses water, and of course weight. It may be exported in the original *bolachos*, but owing to the danger of adulterants in the form of sand, stones, etc., it is now mostly cut into small pieces in *Para*.

DESCRIPTION.—The following is the official description of *elastica*:

In cakes, balls, or hollow, bottle-shaped pieces, externally brown to brownish-black, internally brownish or of lighter tint; very elastic; insoluble in water, diluted acids, or diluted solutions of alkalis; soluble in chloroform, carbon disulphide, oil of turpentine, benzoin, and benzol. When heated to about 125° C. (257° F.) it melts, remaining soft and adhesive after cooling. Odor faint, peculiar; nearly tasteless.

COMPOSITION.—The percentage of caoutchouc in *India rubber* varies with the amount of water which the substance has lost. In its original liquid condition there is said to be about thirty-two per cent. of this hydrocarbon (C₂₀H₃₂). With caoutchouc exist a little wax, a free acid, and some proteid matter. There is a little free carbon, which results from the smoking process.

PROPERTIES AND USES.—On continued exposure to the atmosphere, rubber undergoes changes which render it brittle and weak, and this may be prevented by keeping it under water, which preserves it by inducing superficial fatty changes. *Vulcanized rubber* is produced by combining the original rubber with sulphur, under the influence of heat, by various processes. It still retains its elasticity, but becomes harder and is no longer soluble in the same liquids as before. *Hard rubber* or *ebonite* may be obtained by combining rubber with various other substances than sulphur.

Strictly speaking, rubber has no medicinal properties, since it is insoluble in all the fluids of the body. The original milk, being drunk by mistake, has invariably coagulated into an insoluble mass in the stomach, the result being fatal in the absence of surgical treatment. Its uses are wholly mechanical. The most important is as a mass for plasters. Such a mass possesses very good qualities, although experiments seem to indicate that the effect of the incorporated medicinal substance is somewhat less than when combined with the official plaster mass. Rubber-mass adhesive plasters for surgical dressings, Esmarch's and other elastic bandages and wrappings, orthopedic appliances, nipples, syringes (hard and soft), pessaries, artificial teeth, specula, catheters, etc., represent important uses of rubber, which require only enumeration. Articles of rubber, either hard or soft, should be kept in a closed box or drawer, and occasionally used or washed to prevent their becoming too dry and brittle. Silver instruments should never be kept in the same enclosure with them. Soft rubber is spoiled after a short time by oils and fats, and eventually hardens in spite of precautions.

By dissolving rubber in appropriate liquids, with or without the addition of other adhesives, various forms of cement or glue can be obtained, and impervious coverings can be produced by applying such substances and permitting evaporation. *Henry H. Rusby.*

RUBELLA. See *Roetheln*.

RUBIDIUM AND AMMONIUM BROMIDE.—A double salt having the chemical formula RbBr,3NH₄Br. It is a white or yellowish-white crystalline powder, soluble in water, and possessed of a cooling and saline taste.

This salt has been proposed as a more suitable means of administering bromine than the ordinary ammonium, potassium, or sodium salts. Laufenauer (*Therap. Monatsch.*, August, 1889), reasoning from the fact that lithium bromide is more powerful than ammonium bromide, the sodium salt more so than the lithium, and the potassium salt still more powerful, was led to believe that the more strongly electro-positive the salt, and the higher its atomic weight, the greater its power in disease. As rubidium is powerfully electro-positive and has a high atomic weight, the bromide of rubidium and ammonium was prepared, and in a series of experiments was found to prove more satisfactory than the other bromides in epilepsy and other conditions in which bromides are indicated.

Further use of the drug has proved its efficacy, but has not shown any decided advantage over other bromides. It, however, has not the depressing effects of the potassium salts, and may be given where the more common compound has to be discontinued. As an anti-epileptic remedy, it is given in doses of sixty to ninety grains in divided portions. As a hypnotic and sedative, sixty grains may be given in a single dose.

Rubidium bromide and *rubidium iodide* have also been prepared, but their therapeutic value has not been established. *Beaumont Small.*

RUBINAT MINERAL SPRINGS.—Province of Lerida, Spain. These springs, which supply the well-known waters of the Rubinat group, are located at a high elevation in the Pyrenees, near the village of Rubinat. We are informed that some of the springs have been known from time immemorial, and were resorted to in the Middle Ages by pilgrims from all over the kingdom. In recent years the waters have come into commercial use, and those of some of the springs are exported in large quantities to the American markets. Among the better known waters of the group are the Rubinat-Condal, Rubinat-Serre, and Rubinat-Llorach, all of which are extensively sold in the United States. Following are analyses of the first two:

Rubinac Condal.—One United States gallon contains:* Sodium sulphate, gr. 5,407.34; potassium sulphate, gr. 13.22; magnesium sulphate, gr. 183.97; calcium sulphate, gr. 109.44; sodium chloride, gr. 115.94; silica, alumina, ferric oxide, gr. 2.08; loss, gr. 0.98. Total, 5,832.97 grains.

Rubinac Serre.—One United States gallon contains:* Sodium sulphate, gr. 4,695.97; magnesium sulphate, gr. 135.54; calcium sulphate, gr. 79.57; calcium bicarbonate, gr. 29.40; sodium chloride, gr. 262.23; potassium silicate, gr. 36.83. Total, 5,239.54 grains.

These analyses show very potent waters of the sulphated saline group. They owe their purgative properties chiefly to the presence of the sulphate of sodium in large quantities, although both contain considerable sulphate of magnesia. They act as very efficient saline cathartics and are indicated in conditions where such remedies are useful. The dose varies from one to eight or nine ounces, according to the indications, and the water is best taken in the morning, on rising. According to the author's observation these waters are not so likely to cause griping as are some of the stronger bitter waters. *James K. Crook.*

RUE.—*Ruta.*—The leaves of *Ruta graveolens* L. (fam. *Rutaceae*).

This is a perennial herbaceous or partly woody plant, two or three feet in height. It has pale green, cylindrical, branching stems, alternate, smooth, light green,

* Converted from grams per litre.

glandular dotted leaves, which usually dry yellowish; the lower twice or three times pinnate and long petioled, the intermediate once or twice pinnate, the uppermost simple and sessile; divisions wedge-shaped, rounded, or blunt at the extremity.

Flowers yellowish, in a terminal corymb, with the parts in fours or fives; stamens twice as many; sepals small, pointed; petals large (one-half inch long), rounded and hooded at the ends, narrow below. Fruit a dry, dehiscent capsule, containing numerous angular, blackish seeds. Rue is a native of Southern Europe, the Levant, etc., and is also cultivated. It has a strong disagreeable odor, and a bitter, sharp taste.

The aromatic properties of rue are due to about one-fourth of one per cent. or less of a peculiar, very light volatile oil, usually more or less yellowish in color, and of an extremely powerful and disagreeable odor. Its bitterness is due to the crystalline yellow glucoside *rutin* (C₂₂H₃₀O₂₂), also known as *rutinic acid*, and said to be contained also in buchu, capers, and some other drugs. Considerable quercetin and sugar also occur.

ACTION AND USES.—Rue is one of the most ancient of drugs. Its action appears to be that of the volatile oil, differing chiefly in its lesser intensity. Taken internally, in small doses, it is stomachic, laxative, and stimulant to the secretions, especially to those of the intestine and kidneys. In somewhat larger doses it is a powerful anti-spasmodic. It also acts as an emmenagogue, and is in overdoses an irritant intestinal and renal poison and an abortifacient. Among the ancients it was used for its aphrodisiac properties. The dose of the drug ranges from ten to twenty grains, and it is best given in the form of a twenty-per-cent. tincture, made with diluted alcohol, dose fifteen to sixty minims.

Oil of rue was official in the United States Pharmacopœia of 1870 and 1880. It possesses all the above-named properties of rue in a greatly intensified degree. It is a powerful counter-irritant, capable of producing vesication similar to that from croton oil. It is a well-known and dangerous abortifacient, and is capable of acting as a fatal irritant-narcotic intestinal poison. It is not often given internally at the present time. The dose is from two to five minims. *Henry H. Rusby.*

RUMINATION IN MAN. See *Stomach, Diseases of the*.

RUPIA. See *Syphilis*.

RUSSEL'S BODIES. See *Carcinoma*.

RUTLAND, MASSACHUSETTS.—Rutland, Mass., situated in almost the geographical centre of Massachusetts, fifty-four miles from Boston, is the seat of the "Massachusetts State Sanatorium" for pulmonary tuberculosis, the first institution of the kind established in the United States, having been opened for patients October 1st, 1898.

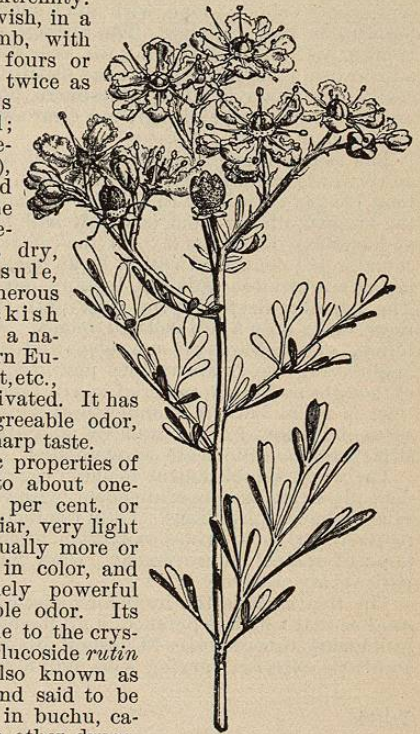


FIG. 4138.—Flowering Branch of Rue. (Baillon.)