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A REFERENCE HANDBOOK
OF
THE MEDICAL SCIENCES.

SACCHARIN or **GLUSIDE** — (*Benzoyl-sulphonimide*). A coal-tar product, a derivative of toluene, with the formula $C_6H_4(CO)(SO_2)NH$. It occurs as a light, white powder, odorless but with an intensely sweet taste. It is very slightly soluble in cold water, more so in boiling water, alcohol, and glycerin. Its solution gives an acid reaction, and it forms sweet salts with alkaloids and metals. Its property of combining with alkaloids is taken advantage of to supply quinine and other bitter substances in a more palatable form. The insolubility of gluside is overcome by combining it with soda to form a soda salt which is very soluble. It may be prepared by dissolving one hundred parts in water and neutralizing the solution with bicarbonate of soda and evaporating to dryness; this forms one hundred and thirteen parts of soluble gluside or saccharin. It has been placed in the British Pharmacopœia under the title of Glucidum.

Excepting in its sweetening power, gluside is not allied to sugar in any way. It does not affect polarized light, it lacks the essential character of sugar to produce alcohol by fermentation, and when administered does not increase the production of sugar in the system. It is this latter quality that renders it of value in the treatment of diabetes, where it is desired to avoid the use of sugar as far as possible.

Gluside is two hundred and eighty times as sweet as sugar, and if it is remembered that an ordinary lump of sugar ranges from 150 to 300 grains, it is very evident that one-half to one grain will be an equivalent. Its disadvantages are the distaste that the patients are liable to have for it after using it for a time, and the dry, acrid sensation which it produces in the pharynx. In medicines, it may also be used to replace sugar and syrup for the purpose of rendering them palatable, one grain with a six-ounce mixture furnishing sweetness equal to one ounce of ordinary syrup. To facilitate dispensing, the following solutions are prepared:

Liquor Glusidi.—From the "National Formulary" of the American Pharmaceutical Association. Gluside, 512 grains; bicarbonate of sodium, 240 grains; alcohol, 4 fluidounces; water, sufficient to produce 16 fluidounces. Each drachm represents four grains of gluside.

Elixir Glusidi.—From the "Unofficial Formulary" of the British Pharmaceutical Conference. Gluside, 480 grains; bicarbonate of sodium, 240 grains; rectified spirit, 2½ fluidounces; distilled water, a sufficiency. Rub the gluside and the bicarbonate of sodium in a mortar, with half a pint of distilled water gradually added. When dissolved, add the spirit, filter and wash the filter with sufficient distilled water to make one pint. Each drachm represents three grains. Saccharin may be given freely, as it is devoid of toxic action. In some cases reported its prolonged use has produced symptoms of gastric disturbance with indigestion, but this rarely occurs. As much as seventy-five grains have been given at one dose without producing any ill effect. It is, however, advisable that not more than twenty-five grains daily be administered.

Gluside possesses antiseptic properties in common with other coal-tar derivatives, and for this reason it has been suggested as a remedy in many diseases. It has been used in pulmonary phthisis, acute articular rheumatism, scarlatina, intestinal catarrh, cystitis, and a number of other disorders in which its antiseptic action might prove of service. Of these, cystitis is the only one in which any satisfactory results have been obtained. In this condition it is administered internally and renders the urine antiseptic during its excretion. When there are pus and an alkaline reaction, this is rapidly overcome, and the urine becomes clear and normal in character; the change in the urine being accompanied by a corresponding improvement in the mucous membrane of the bladder. Three grains, in divided doses, daily, is the quantity recommended, and this is to be continued for a prolonged period. The bladder may also be irrigated at the same time. *Beaumont Small.*

SACCHAROMYCOSIS.—Our knowledge of pathogenic yeasts and of the pathological conditions produced by them is at present but slight; and the unsatisfactory state of the classification and terminology of the blastomycetes has led to much confusion. Inasmuch as the blastomycetes are usually divided into various genera, *Saccharomyces, Oïdium, Monilla,* etc., the term *saccharomycosis* should be limited to the pathological conditions produced by the yeasts which are included under the *Saccharomycetes,* viz., those characterized by their power to ferment sugar and form alcohol, of which *Saccharomyces cerevisiæ* may be taken as the type. But few observations of such pathogenic yeasts have been made. The most important contributions to this subject are those of Busse and Curtis.

In 1895 Busse obtained pathogenic yeasts from a woman suffering with a peculiar cystic tumor of the tibia, which on microscopical examination presented the appearance of a sarcomatous-like granulation tissue containing giant cells. From the viscid fluid obtained from the tumor yeast-like fungi were cultivated. Pure cultures of the yeast were pathogenic for mice and rabbits, giving rise, when injected into the animal, to nodules of chronic granulation tissue, and leading to the formation of metastatic miliary nodules in the brain, kidneys, and lungs. The organism grew well on ordinary media, at ordinary and incubator temperatures, forming white, non-characteristic growths, which did not liquefy gelatin. On special media to which malt extract was added the growth was more abundant, and on potato and other media, grayish or black cultures were obtained. Acid media seemed especially to favor its growth. Glucose media were fermented with the production of alcohol and carbonic dioxide. Reproduction took place by budding exclusively. The patient died thirteen months after the appearance of the tibial tumor, and at autopsy numerous foci of disease, containing the yeast in great abundance, were found in the lungs, kidney, and spleen, some reaching the size of an apple. The yeasts were also found in a small corneal vesicle. Microscopically these lesions resembled those of a chronic inflammatory process with caseous and fatty degeneration; in these lesions the yeasts were found in great numbers, lying singly or in colonies.

In the next year a similar case was reported by Curtis,

who obtained a yeast, *Saccharomyces subcutaneus tumefaciens*, from myxomatous tumors appearing in a young man, beneath the skin of the neck and thigh, and also from a large ulcer of the loin. Microscopically these tumors resembled myxosarcoma. Both in and between the tumor cells yeasts were found in large numbers. These were easily cultivated, and caused sugar to ferment with the production of alcohol. Dogs, rabbits, rats, and mice were susceptible to inoculation, a chronic inflammation and proliferation being produced at the site of injection. In old cultures endosporous division was seen.

Corselli and Frisco report a case of saccharomycosis in which "sarcomatous" nodules were found in the omentum and mesentery. The chylous ascitic fluid obtained by exploratory puncture during life contained the yeast fungi, which were cultivated and found to be pathogenic for dogs, rabbits, and guinea-pigs.

Pathogenic yeast fungi have also been found in cases of chronic catarrh of the uterine cervix (Colfe and Buschke), and in proliferative catarrh of the nasal mucosa (Busse). Saccharomycetes have also been reported as occurring in the secretion from a case of peculiar inflammation of the conjunctiva and cornea; in pharyngitis; in the purulent discharge of otitis media; in the blood, sputum, and urine of a case of typhus (Calmette); in a pseudomembranous angina in a patient suffering from typhoid (Froisier and Achalme). *Saccharomyces ruber* has been regarded as the cause of a house epidemic of intestinal catarrh, the infection occurring through the contamination of milk. This same yeast was isolated by Casagrandi from diabetic urine. When inoculated into animals it produced small nodules containing pus. A variety closely related to, if not identical with *Saccharomyces cerevisiæ*, has been found in the coating of the tongue, in diarrhœal stools, in vomited material, and in diabetic urine.

Inasmuch as the organism of thrush is classed by some writers as a yeast—*Saccharomyces albicans*—the lesions of thrush would be considered under the head of saccharomycosis. (See *Mouth, Diseases of*, in THE APPENDIX.)

Pathogenic saccharomycetes have been found in a number of diseased conditions of the lower animals. *Saccharomyces niger* (Maffuci and Sirleo) has been regarded as the cause of a pulmonary affection which occurs in guinea-pigs and resembles tuberculous pneumonia, and of an intestinal condition in the same animal, characterized by ulceration of the mucosa and enlargement of the mesenteric glands. *Saccharomyces guttulatus* has been described by Casagrandi and Buscalioni as occurring in the intestinal tract of mammals. These authors isolated it from the stomach and intestines of rabbits. It causes glucose to ferment with the formation of alcohol and it inverts saccharose. When inoculated into rabbits, guinea-pigs, and rats it produces nodules containing pus, and finally death. Sanfelice obtained from swine a non-liquefying, gas-producing yeast—*Saccharomyces granulomatosus*—pathogenic only for swine, and producing granulomatous nodules, containing giant cells, in which the parasites often become calcified. The experimental "pseudo-tumors" produced by the injection of blastomycetes have also been described under the head of saccharomycosis.

The various pathogenic organisms described as saccharomycetes and the lesions ascribed to them can hold but a tentative position in pathology, until more definite light has been thrown upon the subject by additional observation and experimentation.

Aldred Scott Warthin.

SACRO-ILIAC DISEASE.—Tuberculous disease of the sacro-iliac articulation is uncommon and extremely so in childhood. The symptoms are pain, limping, weakness, and change in attitude. The pain is referred to the side of the pelvis or radiates over the buttock or thigh. It is increased by jars, by turning the body suddenly, sometimes by coughing or laughing. A peculiar feeling of insecurity and weakness about the pelvis and hip-joint is a common symptom. The trunk is inclined toward the sound limb, as a result of which the pelvis is lowered on the affected side. The leg seems longer than its fellow, and the patient walks with a peculiar awkward limp. In the early stage of the disease there is no deformity of the limb, but if a pelvic abscess forms the thigh may become flexed. Locally there may be sensitiveness to direct pressure on the articulation and swelling in the neighborhood of the disease, although this is usually a late symptom. Pain is induced by lateral pressure on the pelvis or by any manipulation that disturbs the articulation.

Abscess finally appears in the majority of cases. It may be extra- or intrapelvic. In the latter case it may present itself above the crest of the ilium. It may pass through the sciatic notch or appear in the ischiorectal fossa, or it may break into the rectum.

Sacro-iliac disease may be mistaken for sciatica or for disease of the hip or spine. The freedom of motion and the absence of muscular spasm when the pelvis is fixed, if examination is carefully conducted, should exclude both the one and the other, although the pain on lateral pressure, which is described as the most characteristic symptom, may be simulated closely by primary acetabular disease. The attitude is similar to that of sciatica, but the symptoms of local sensitiveness to jars and to manipulation are much more marked.

TREATMENT.—The local treatment consists in protecting the sensitive parts from injury, and the removal of the disease if it be possible. In the ambulatory treatment a plaster spica bandage or a double Thomas hip brace combined with the use of crutches may be indicated, but in most instances a broad, strong pelvic girdle, which may be drawn tightly about the pelvis, will be most efficient. If motion of the spine causes discomfort, this girdle may be reinforced by some form of spinal brace. Constitutional treatment is of course indicated as in other forms of tuberculous disease.

The PROGNOSIS is unfavorable, probably because the majority of the cases are in adults, a class in which the prognosis of any tuberculous disease is more serious than in childhood. In addition there is usually the complication of an infected and burrowing abscess.

Injury of the Sacro-Iliac Articulation.—All the symptoms described as characteristic of the tuberculous disease of the sacro-iliac articulation may be induced by strain or other injuries of this region, and doubtless by other affections than tuberculosis, such, for example, as rheumatism or infectious arthritis.

Such causes are perhaps more common in early life than is tuberculous disease. The principles of treatment (that is, rest and protection of the sensitive part by the pelvic girdle or other support) are indicated. If this treatment is efficient the cure is usually rapid and complete.

Royal Whitman.

SAEGERSTOWN MINERAL SPRINGS (formerly Eureka Springs).—Crawford County, Pennsylvania.

POST-OFFICE.—Saegerstown. Hotel and sanatorium.

ACCESS.—Viâ main line of the Erie Railroad to Saegerstown, six miles east of Meadville.

Saegerstown is situated on the historic Venango River, now called French Creek, in a beautiful and healthful valley, 1,200 feet above the ocean level. The scenery here is of a charming rural character, and the surroundings offer excellent opportunities for fishing, rowing, hunting, driving, bicycling, etc. The sanatorium is a large and commodious building, having all the modern conveniences of a hotel combined with facilities for the care and treatment of invalids. The grounds are tastefully laid out, and include spaces for croquet, lawn-tennis, and other games. A billiard-room and bowling alley have been fitted up for the guests of the house, and during the busy season an orchestra will furnish music in the evening hours. The hotel is open the entire year. There are two mineral springs at Saegerstown, issuing from a bed of rock about three hundred feet deep. An analysis, made in 1896 by W. H. Dean, analytical chemist

of Wilkesbarre, showed the following chemical ingredients of one of the springs:

One United States gallon contains (solids): Sodium chloride, gr. 7.46; sodium sulphate, gr. 0.62; potassium sulphate, gr. 0.22; calcium sulphate, gr. 4.33; calcium carbonate, gr. 3.26; magnesium carbonate, gr. 2.85; iron oxide and alumina, gr. 0.15. Total, 18.89 grains.

The water is free from nitrates and nitrites or other organic impurities, and will keep indefinitely without undergoing impairment of mineral properties. The water is bottled and shipped to all points. It will be found useful in the diseases benefited by this class of waters. Elaborate bathing facilities are supplied to visitors at the springs.

James K. Crook.

SAFFRON.—*Spanish Saffron. Crocus* U. S. P., B. P., P. G. *Stigmata croci. Safran*, Fr. Cod. The dried stigmas of *Crocus sativus* L. (fam. *Iridaceæ*).

The saffron plant is a perennial herb, resembling colchicum, but with an inferior ovary. It grows from a flattened fleshy corm and bears one or two flowers, each possessing a long thread-shaped style, terminating in three long stigmatic branches. These branches, with a very short portion of the style, are collected and dried and constitute the drug. The nativity of the plant is not certainly known. Cultivated plants yield the whole of the product, which is mostly exported from southern Europe, especially Spain. It grows readily in most warm-temperate regions, but the profitable production of saffron is chiefly a labor problem, since nearly four thousand flowers are required to yield an ounce, and its successful production requires exceedingly low-priced labor.

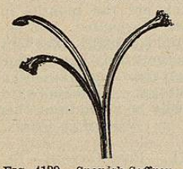

FIG. 4139.—Spanish Saffron.

DESCRIPTION.—Separate stigmas or three attached to a very short portion of their style, each 2 to 3 cm. (about 1 in.) long, flattish-filiform below, dilated and funnel-form tubular above, with the margin irregularly notched; orange-brown, the style portion yellow; texture somewhat cartilaginous, unctuous to the touch, strongly and peculiarly aromatic and bitterish. When chewed it tinges the saliva deep orange-yellow.

So costly a drug is of course subject to numerous and cunningly devised methods of adulteration, some of which are provided against as follows by our Pharmacopœia:

When soaked in water, it should not deposit any pulverulent, mineral matter, nor show the presence of organic substances differing in shape from that described.

On agitating 1 part of saffron with 100,000 parts of water, the liquid will acquire a distinct yellow color. No color is imparted to benzin agitated with saffron (absence of *picric acid* and some *other coal-tar colors*).

On drying saffron at 100° C. (212° F.), it should not lose more than fourteen per cent. of its weight (absence of *added water*).

When thus dried, and ignited with free access of air, 100 parts of the dry saffron should not leave more than 7.5 per cent. of ash (absence of *foreign inorganic substances*).

One of the commonest methods of increasing the yield of saffron is that of collecting a large portion of the style with the stigmas, and the possible presence of these styles is referred to in our own and other pharmacopœias. Onion roots have been chopped up and colored to substitute saffron, as have other fibrous or filamentous bodies. The most important substitute, however, and that very generally sold for saffron in this country, is safflower, which will be found described at the close of this article. The detection of adulterants of nearly all kinds is far less easy when the product is pressed into cakes, so that loose or "hay" saffron is always to be preferred. All things considered, the microscope probably offers the most reliable means for detecting adulterants, and a moderately low power suffices for most of them.

CONSTITUENTS.—Saffron owes its odor to about one per cent. of a volatile oil, which differs considerably according to the method of distillation, being sometimes lighter, sometimes heavier than water. Its color is due to the presence of the yellow glucoside *crocin* ($C_{44}H_{70}O_{28}$), which yields reddish *crocetin*. The name *polychroït* was formerly applied to this coloring matter, but the substance so described was subsequently found to be a mixture, consisting largely of crocin. The bitterish taste of crocus is due to a glucoside which has been called picrocrocin. The other constituents of crocus are unimportant. Crocin is very slightly soluble in water, unless rendered alkaline, but is soluble in alcohol. It becomes blue, then violet-brown with concentrated sulphuric acid, and green, afterward yellow and brown, with nitric acid. The yield of volatile oil is greatly increased by previous treatment with sulphuric acid.

ACTION AND USE.—Crocus has had a wonderful history as a drug. It was credited with remarkable powers by the ancients, and is still so, to some extent, by the more ignorant classes. It, however, probably possesses no other medicinal properties than those of a mild aromatic, stimulant, carminative, and antispasmodic, and may be given in doses of 0.3–2 gm. (gr. v.–xxx.). The Pharmacopœia provides a ten-per-cent. tincture. As used at the present day, especially in the United States, it is almost wholly for the purposes of coloring and slight flavoring.

Safflower, Carthamus, African or dyer's saffron, False, American or *Thistle saffron*, consists of the florets of *Carthamus tinctorius* L. (fam. *Compositæ*). Although called American saffron, this plant is of Oriental nativity. It is widely cultivated for ornament and also, to some extent, for the product here described. It produces handsome large flower heads, of an orange-yellow color, at the ends of the branches. From these the florets are plucked out, dried, and constitute the drug. They were formerly largely used for dyeing purposes and are still so used to a considerable extent in India. They constitute a red or deep orange-red mass, of a rather slight characteristic odor and an aromatic and bitterish taste. The individual florets are about 2 cm. ($\frac{4}{5}$ in.) long, though often broken, tubular, and very deeply divided into five linear and nearly equal lobes. The stamens have long exserted coherent anthers and a slender style which is considerably longer than the stamens. The ovary should not be present. The principal coloring matter of safflower is deep yellow and constitutes one-fourth or more of the weight of the drug. It is known as *safflor-yellow* ($C_{24}H_{30}O_{15}$) and is soluble in water. There is also a fraction of one per cent. of the red coloring matter *carthamic acid* or *carthamin* ($C_{14}H_{16}O_7$), which is not soluble in water but gives a beautiful purple color in alcohol. The latter coloring matter exists in commerce as a reddish-brown, somewhat metallic powder. It is used in rouge-making. The properties and uses of safflower differ but little from those of saffron, and its principal use is in fact the substitution of the latter.

Henry H. Rusby.

SAGE.—*Garden Sage. Salvia*, U. S. P. The dried leaves of *Salvia officinalis* L. (fam. *Labiatæ*).

This is a half shrubby, gray-hairy perennial, the stems dying down to within a foot or so of the ground in the fall, but branching very freely into herbaceous flowering branches, which are quadrangular and attain a height of two or three feet. The leaves are opposite, the flowers in a mixed spike, with two-lipped, pubescent, bell-shaped calyx, and a conspicuously labiate, blue corolla, with a ring of hairs at the base, inside; upper lip of the corolla concave, notched at the apex, the lower three-lobed; the central one much the largest and longest. Perfect stamens two, with widely divergent anther cells, but one of which in each stamen is perfect. Ovary four-lobed. Fruit of four nutlets. Sage, like so many others of our household mints, is a native of Southern Europe. It has, however, been cultivated for centuries, and transplanted to all temperate countries. Leaves rather long and stoutly petioled, the blades 3–7 cm. (about 1–3 in.) long and nearly half as broad, oblong or slightly broader

below the middle, rounded or subcordate at the base, mostly blunt at the summit, crenulate, thickish, gray-green, and densely hairy, especially underneath, very strongly veined, the veins finely reticulate, often pinkish or purplish, as is the petiole; aromatic in odor and taste, the latter also bitter and somewhat astringent.

Sage owes its very characteristic odor and its properties as an aromatic drug to a peculiar volatile oil (less than one per cent. in the fresh, up to 2.5 per cent. of the dried leaves). It also contains an unknown bitter substance and apparently tannin, together with resin and a little gum. Oil of sage is a commercial article, and is of a yellowish or greenish-yellow color, with a specific gravity of about 0.92. Its chief constituent has been called salviol, but it is now considered identical with thujone, the active constituent of Arbor vitæ, and this occurs also in some other volatile oils. A small amount of cineol is also contained.

Sage resembles the rest of the Mint family in its general action; it is aromatic, a gastric stimulant, and by reason of its bitterness also tonic. It is also, what all are not, mildly astringent. In large quantities of hot water, like many other mints, it is given as a sudorific in the beginning of feverish colds, etc. Sage is useful in mouth washes and as a gargle. It is, however, almost entirely a domestic remedy, and even as such but little used of late, although formerly in high repute. It is one of the ingredients of the formerly official aromatic wine (*Vinum Aromaticum*), an old-fashioned liniment.

W. P. Bolles.

SAINT AUGUSTINE, FLORIDA.—This picturesque and well-known winter resort is situated on the Atlantic coast of Florida, thirty-eight miles southeast from Jacksonville, and about two hundred and fifty miles north of Palm Beach. The city occupies a narrow peninsula opposite Anastasia Island, which forms a breakwater against the open ocean. The surrounding country is flat and sandy and covered with the scrub palmetto.

The town is the oldest in the United States, and has a permanent population of between four and five thousand inhabitants, which number is doubled or more at the height of the season. The city retains many of its antiquities, and is exceedingly quaint and attractive. The narrow streets; the ancient Spanish "coquina," or shell-limestone residences, with their overhanging balconies; the old "City Hall," and Fort Marion, are all exceedingly interesting relics of the Spanish occupancy.

Many new and attractive buildings have of late years sprung up—several extensive hotels of the Spanish style of architecture, with beautiful grounds and courtyards; villas, with grounds ornamented with orange, lemon, and fig trees, palms, and a variety of tropical flowers and shrubs; churches, convents, and the restored Cathedral and Old Market.

The attractions at this resort are many and varied, as can easily be imagined. Besides those already mentioned, there are a United States military post, with daily guard mount, the sea wall affording a delightful promenade along the water front; many excursions by water; visits to the orange groves; drives, hunting, fishing, sailing, golf, and the never-ending delight of wandering through the old town. Connected with one of the hotels is a casino, where are Turkish baths, a swimming pool, various entertainment halls, lawn-tennis courts, etc.

The winter climate is a mild, equable, moist one; and in summer the heat is tempered by the sea breezes. Frosts are rare. Although the climate is of a somewhat less tropical nature than that of the resorts on the lower half of the peninsula, such as Palm Beach, Tampa, and Miami, still a very comfortable, mild atmosphere is found here in the winter, and there is a good proportion of sunny days.

The average mean temperature of twenty years for the four seasons, as given by Dr. Wall (*The Climatologist*, October 15th, 1891), is as follows (degrees Fahr.): Spring, 68.5°; summer, 80.3°; autumn, 71.5°; winter, 58.1°; and for the whole year, 69.6°. For the four winter months, according to the same authority, it is, for December, 57.2°; January, 57°; February, 59.9°; March, 63.3°. The average yearly rainfall is about 49 inches, varying quite considerably in different years; for example, it was 67.4 inches in 1880 and 33.9 inches in 1851. The least rainfall appears to be in January. The prevailing winds are from the northeast. The climatic data of Jacksonville, which is only thirty miles to the north of St. Augustine, can be taken as fairly accurately representing those of the latter resort, and the reader is referred to the article upon *Jacksonville* in Vol. V. of the HANDBOOK for more extended meteorological facts.

The water supply is abundant and obtained from artesian wells; and the streets are clean and well lighted. The sanitary conditions of the hotels are carefully looked after.

There is a well-appointed, indeed a luxurious, hydrotherapeutic establishment where hot and cold saline and hydro-electric baths are given by skilled attendants; and cases of rheumatism, gout, and nervous disorders are treated in this way. The Nauheim baths and the Schott system of treatment for heart disease; various methods of electrical applications, gymnastics, douches, and massage are also included in this establishment.

January, February, and March are the months in which St. Augustine is the most frequented. On account of its easy accessibility, mild climate, excellent accommodations and many attractions, this has become a popular and fashionable winter resort, and has been compared to Newport and Saratoga. Excursions to other portions of Florida can easily be made from this point.

Edward O. Otis.

SAINT CATHARINE'S WELL.—POST-OFFICE.—St. Catharine's, Ontario. Hotel, The Welland House.

ACCESS.—Viâ Grand Trunk Railway from Toronto, or Buffalo.

Analysis (Professor Croft).—Ten thousand grains of water contain: Carbonate of iron, gr. 0.5210; carbonate of lime, gr. 0.0820; sulphate of lime, gr. 19.7934; chloride of calcium, gr. 174.4876; chloride of magnesium, gr. 40.6644; chloride of sodium, gr. 378.4196; chloride of potassium, gr. 2.8119; bromide of sodium, a trace; iodide of sodium, gr. 0.0140. Total, 616.7938 grains.

St. Catharine's is situated twelve miles from Niagara Falls in what is termed "the Garden of Canada." There are a number of springs which have long been famous, and at different times sanatoria have been opened. The Welland is under excellent management and has during the past year been enlarged and furnished with all the appliances of a modern sanatorium. A resident physician is in charge with a staff of skilled nurses. Every provision is made to utilize the water after the most approved methods of hydrotherapeutics. The hotel is open throughout the year.

Beaumont Small.

SAINT CLAIR SPRINGS.—St. Clair County, Michigan.

POST-OFFICE.—St. Clair Springs. Hotel, The Oakland.

ACCESS.—From Detroit by steamer from the foot of Griswold Street, twice daily; distance fifty miles. Also from Detroit viâ Grand Trunk Railway (foot of Brush Street), twice daily; distance fifty-one miles. Railroad connection for springs can also be made at St. Thomas, Ontario, viâ Canada Southern Railroad. Steamer connection once daily is made at Port Huron, Mich.

St. Clair Springs is one of the strictly first-class health and pleasure resorts of the United States. The Oakland Hotel, situated in a tract of about one hundred and sixty-five acres fronting on the St. Clair River, at the extreme southern portion of the city of St. Clair, affords all the comforts, conveniences, and luxuries to be found at our older Eastern resorts or at the European spas. The hotel is open for the reception of health- or pleasure-seekers all the year round. Two classes of mineral waters of very pronounced yet very different type are found here. The first of these is a powerful muriated saline water. The analysis is by Professor Duffield:

One United States gallon contains (solids): Sodium

chloride, gr. 8,120; calcium chloride, gr. 7,382.20; magnesium chloride, gr. 1,012.20; calcium sulphate, gr. 144.20; silica, gr. 416; alumina, gr. 830; and traces of magnesium carbonate, calcium carbonate, magnesium iodide, and magnesium bromide. Total, 17,904.60 grains. Sulphureted hydrogen gas, 25.59 cubic inches.

It will be observed that the water contains an unusually large quantity of chloride of lime. The salt is believed by some observers to possess valuable alterative properties and to be of great assistance in the treatment of the strumous diathesis. The water also possesses all the well-known virtues of the densely charged chloride-of-sodium groups. It is used only for bathing purposes and as a spray or douche. An elegant and elaborate bathhouse, presenting all varieties of baths, sprays, douches, etc., is maintained in connection with the hotel.

The "Salutaris" is a natural gaseous alkaline mineral water, very wholesome and pure. It is said to be entirely free from organic matter, and constitutes an excellent table water. It is bottled and extensively sold in the United States.

The attractions in and about the Oakland Hotel are of a manifold character: expansive shaded lawns, picturesque drives; boating and sailing on the river, and all the indoor pastimes of the day will be found here.

James K. Crook.

SAINT HELENA WHITE SULPHUR SPRINGS.—Napa County, California.

POST-OFFICE.—St. Helena. Hotel and cottages.

ACCESS.—Take ferry from San Francisco foot of Market Street, at 8 A.M. and 4 P.M. Arrive at St. Helena viâ Calistoga train at 11:03 A.M. and 7:08 P.M. Take stage to springs, two miles distant.

ONE UNITED STATES GALLON CONTAINS:

Solids.	Spring No. 2. Grains.	Spring No. 6. Grains.	Spring No. 7. Grains.
Carbonate of iron	.62	.56	4.36
Carbonate of magnesium	8.26	11.33	12.84
Sulphate of sodium	21.72	23.41	14.23
Chloride of sodium	1.32	.86	.78
Chloride of calcium	.87	2.22	.65
Sulphides of sodium and calcium	2.65	1.85	1.62
Total solids	35.44	40.23	34.48
Gases.	**Cubic inches.**	**Cubic inches.**	
Sulphureted hydrogen	6.15	4.25	Trace.

This beautiful summer resort is located in one of California's loveliest valleys. The neighboring mountainsides are covered with forests, shrubbery, ferns, and wild flowers of every description. Brooks and cascades are seen on every hand. The grand old California redwoods, which are found here in great abundance, are alone worth a visit to this region. The mineral springs are numerous and valuable, and chiefly of the saline-chalybeate type. Mr. Sanford Johnson, the proprietor, furnishes us with the accompanying analysis of three of the springs.

There are six other springs which have not been completely analyzed. The waters vary in temperature from 64.4° to 97.25° F. The analysis shows them to possess valuable tonic properties. They are said to have considerable value in rheumatism and kidney affections.

James K. Crook.

SAINT LOUIS, MO.—This great city of nearly 600,000 inhabitants is situated in the northeastern corner of Missouri upon the Mississippi River, not far from its junction with the Missouri.

A description of the city is hardly necessary or pertinent in this connection, as the climate is the chief consideration, of which certain marked peculiarities deserve mention.

In the first place, as will be observed from the table, the excessive extremes of temperature are striking, the annual range being 123.4° F. Although the winter mean temperature is only a few degrees higher than that of New York, for example, the mean summer temperature is five and one-third degrees higher. In July a maximum temperature of 104° F. is noted, while in January a minimum temperature of — 16° F. occurred in the cold wave of 1889. St. Louis is called a "Southern city," and yet it is seen that the winters are severe and quite like those of a Northern city. The summers are usually very hot, the nights as well as the days, and a continuous high temperature may exist for many days in succession; moreover, this heat may continue through the month of September. In July, 1901, there was hardly a day for three weeks in which the temperature was not 100° F. or over. The daily range of temperature is also seen to be considerable, and, consequently, one might hastily conclude that the summer nights would be comparatively cool; but if the day temperature is very high, a diminution of fifteen or eighteen degrees would still give a high night temperature.

Another striking feature of this climate is the prevalence of south winds throughout the year, except in March, when the blizzards change the direction from south to northwest.

The mean relative humidity indicates a moderate amount of moisture, a little less than that of New York City. The rainfall is not excessive and is pretty evenly distributed throughout the year, rather more falling in the spring and summer. There are a few more clear and fair days in St. Louis than in New York, especially in the summer and autumn. The flatness of the surrounding country and the atmospheric conditions favor the

CLIMATE OF ST. LOUIS, LATITUDE, 38° 38'; LONGITUDE, 90° 12'. PERIOD OF OBSERVATION, THIRTEEN YEARS.

	January.	March.	May.	July.	September.	November.	Spring.	Summer.	Autumn.	Winter.	Year.
Temperature, Degrees Fahr.—											
Average or normal	31.7°	43.1°	66.1°	78.8°	68.0°	42.4°	54.7°	76.8°	55.9°	34.0°	55.3°
Average daily range	15.8	16.8	18.7	18.2	19.2	15.5					
Mean of warmest	38.7	53.5	75.4	88.2	79.2	52.1					
Mean of coldest	22.9	36.7	56.7	70.0	60.0	36.6					
Highest or maximum	72.0	82.0	93.0	104.0	101.5	82.0					
Lowest or minimum	−16.0	8.0	32.0	57.0	40.0	5.0					
Humidity—											
Average mean relative	71.2%	66%	64.2%	67.9%	64.7%	67.9%	63.3%	67.4%	65.8%	70.9%	60.8%
Precipitation—											
Average in inches	2.19	3.04	3.86	4.36	2.55	2.79	10.25	11.74	8.12	7.48	37.59
Wind—											
Prevailing direction	S.	N. W.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Average hourly velocity in miles	10.2	11.6	9.7	7.7	8.5	10.6	10.7	8.0	9.5	10.2	9.6
Weather—											
Average number of clear days	8.8	7.7	9.8	11.4	13.9	7.7	26.9	33.5	34.4	24.5	119.3
Average number of fair days	11.3	11.9	11.5	12.9	10.9	12.2	35.2	40.5	34.9	33.0	143.6
Average number of clear and fair days	20.1	19.6	21.3	24.3	24.8	19.9	62.1	74.0	69.3	57.5	262.9