[28] Mall: Anatom. Anz., 1893, and Johns Hopkins Hospital Bulletin, 1893.
[29] Von Spee: His's Archiv, 1896, Pl. i., Figs. 4, 5, 9, and 10.
[30] Graf Spee: His's Archiv, 1889.
[31] Bonnet: His's Archiv, 1889.
[32] Selenka: Studien, etc., Taf. xxxviii., Fig. 35.
[33] Drasch: Anatom. Anz., Bd. 9.
[34] Budge: His's Archiv, 1887.
[35] Kollmann: His's Archiv, Supplement Bd., 1889, Pl. v., Figs. 1 and 2; von Lenhossék: His's Archiv, 1891, Pl. i.; Kollmann: His's Archiv, 1891, Pl. iii., Fig. 3.
[36] Froriep: His's Archiv, 1883 and 1886.
[37] Platt: Bulletin of the Museum of Comparative Zoology, vol. xvii.
[38] Dexter: Anatom. Anz., 1890.
[39] Bonnet: His's Archiv, 1889.
[40] His: Abhandl. d. säch. Gesellsch. d. Wiss., Bd. xxiv.
[41] See also Mall: Journ. of Morph., vol. v.
[42] His: Anat. mensch. Embryonen, Pl. vi.
[43] Minot: Human Embryology, New York, Fig. 169.
[44] His: Anat. mensch. Embryonen, i., p. 126.
[45] His: Anat. mensch. Embryonen, i., p. 126.
[46] His: His's Archiv, 1881, Pl. xii., Fig. 9. Also Anat. mensch. Embryonen, Pl. ix., Figs. 10–12, 14.
[47] Bonnet: His's Archiv, 1889.
[48] Cadiat: Jour. de l'Anat. et de la Physiol., 1883, Pl. v., Figs. 1, 2.
[49] The exceptions have been published by Waldeyer: Studien des physiol. Inst. zu Breslau, 1865; Janosik: Arch. f. mik. Anat., Bd. 30; His: Anat. mensch. Embryonen, Pl. viii., Figs. A 1–4; Mall: Journ. of Morph., vol. v.
[50] His: Anat. mensch. Embryonen, Pl. vi., Fig. 3, No. 10.
[51] Kollmann: His's Archiv, 1891, Pl. iii., Figs. 2, 3, 4. V. umbil.
[52] Mall: Journ. of Morph., vol. v.
[53] Mall: Journ. of Morph., vol. v.
[54] Budge: His's Archiv, 1889 and 1887.
[55] Drasch: Anatom. Anz., Bd. 9.
[56] Cadiat: Jour. de l'Anat. et de la Physiol., 1883, Pl. v., Figs. 1 and 2.
[57] Duval: Atlas d'Embryologie, Pl. xxii., Fig. 354.
[58] Von Baer: Entwicklungsgeschichte, 1837.
[59] Cadiat: Journ. de l'Anat. et de la Physiol., 1878.
[60] His: Anat. mensch. Embryonen, Th. i., 1880.
[61] Uskow: Arch. f. mik. Anat., 1885.
[62] Ravn: His's Archiv, 1889.
[63] Hochstetter: Morph. Jahr., Bd. 20, p. 563.
[64] Mall: Journ. of Morph., vol. v., p. 472.
[65] Ravn: His's Archiv, 1889, Pl. x., Fig. 16.
[66] Minot: Human Embryology, p. 483.
[67] Mall: Journ. of Morph., vol. v.

COFFEE.—The seeds of *Coffea arabica* L. (fam. *Rubiaceæ*). Coffee itself is not official, having been replaced by its alkaloid (see *Caffeine*).

The coffee plant is a good-sized shrub or small tree, with opposite spreading or horizontal branches, and dark green, glabrous, nearly evergreen leaves. The white flowers grow in close clusters in the axils of the leaves. Farther down are the green and then the red fruits, the

Fig. 1465.—Branch of the Coffee Tree, *Coffea arabica*, with Fruit. (Baillon.)

whole being highly ornamental. The fruit is an oblong, rounded, scarlet or purplish, slightly juicy drupe, with a thin, fleshy mesocarp, and a papery endocarp, loosely enclosing the two seeds. It is about 2 cm. long (¾ to ¾ in.).

This shrub is a native of tropical Africa, where it grows very extensively upon both coasts, and far into the interior. It is also cultivated in most of the warm parts of the earth, especially in Java and Brazil.

Our earliest knowledge of coffee came from Arabia, where it was introduced from Abyssinia at least four hundred years ago. Its use was introduced into Europe by way of Constantinople, reaching London and Paris about the middle of the seventeenth century. Its cultivation was begun in Batavia at about the end of the same century, and in the beginning of the next it was being raised in India, Brazil, and the West Indies. The plants and the berries of these different countries present slight variations. Mocha coffee is small, plump, and dark yellow; Java larger and paler, and the Indian and American coffees larger and greenish gray or bluish gray. Mocha has the richest flavor, Java is one of the most delicate, and the West India and Brazilian kinds are coarser and less fragrant. Age, before they are roasted, improves them all.

Coffee is raised in orchards, where the trees are set in rows; trimmed and tended, they are long-lived and bear for many years. Two crops are usually produced each year. The pulp of the fruits is separated, usually by mechanical means, and the papery endocarp, when dry and brittle, broken and rubbed away. The testa of the seed is usually also absent in commercial coffee, excepting on the face, where it enters the ventral fissure.

Composition.—The most interesting ingredient, *Caffeine*, is described elsewhere. It occurs in coffee in combination with *caffeo-tannic acid*, in varying proportions between one-half of one per cent. and two and three-tenths per cent. The quality of the coffee, as usually estimated, depends only partially upon its amount of alkaloid. Of the caffeo-tannic acid, the yield is from four to five per cent. It is of the series which gives green salts with the persalts of iron. Besides these, are *fixed* oils, from fourteen to twenty-two per cent., *dextrin* from fourteen to sixteen per cent., a large amount of *albuminoid matter*, and a very minute amount of *volatile oil*. Roasting changes the character of coffee very materially, dissipating a little of its caffeine and most of its water, and forming some fragrant decomposition products not much understood. The seeds lose about fifteen or twenty per cent. in weight, and gain much more than that in volume. The sugar and dextrin are changed to caramel, and the soluble portions in general are diminished.

Unground coffee is seldom adulterated, but ground coffees are apt to be adulterated, the world over, by grains of various kinds. Of these admixtures, beans and chicory roots are the most important. It is better to purchase the whole seed than to puzzle over the mixtures. Pure ground and burnt coffee shaken in water does not immediately discolor it, as most of the imitations do. Recently, many brands of artificial "coffee," made wholly from grains and so advertised, have come into use as a warm and grateful drink, free from the nervous effects of caffeine. Many people become very fond of these products, which are used upon a vast scale.

Action and Use.—The effect of coffee is in the main the same as that of caffeine, a nervous and cardiac stimulant; but it has in addition a pleasant, exhilarating effect upon the feelings, which is probably in part also due to aromatic ingredients contained in it, or developed by the roasting. It is occasionally given for sick and neuralgic headaches, and to counteract the disagreeable after-effects occasionally produced by opium; and in opium poisoning, which it mildly antagonizes by its stimulating effects upon the brain and circulation. The universal use of coffee, however, greatly restricts its usefulness as a medicine. Its excessive use, or its use by those unfortunately sensitive to it, produces wakefulness, "nervousness," confusion and incoherence of thought, palpitation, and irregular action of the heart and dyspeptic disorder. The excessive use of coffee is believed in Oriental countries to be responsible for many cases of blindness, and it

certainly causes disorders of vision when sufficiently abused to disturb the nervous equilibrium.

The dose of coffee for, say, headache, is from 15 to 20 gm. (ʒ ss.) in infusion, that is, a cupful made strong and "black." A fluid extract is to be had if desired.

There are twenty species of *Coffea*, natives of tropical Asia and Africa, several of which contribute a part to the total yield. One of these, *Coffea liberica*, of Western Africa, produces a larger seed, with a strong, full, but rather rank, flavor, known as Liberian coffee. Coffee leaves themselves contain caffeine, and are used as a beverage in the East. *W. P. Bolles.*

COHOSH, BLUE.—Caulophyllum. Pappoose Root, Squaw Root. The rhizome and roots of *Caulophyllum thalictroides* (L.) Michx. (fam. *Berberidaceæ*). This is a perennial herb, with an erect, smooth stem, about 50 or 75 cm. (20 to 30 ins.) high, bearing a thrice-ternate leaf above the middle, and a raceme of greenish-yellow flowers at the top. The rhizome is horizontal, thick, crooked, scarred above, and covered below with numerous roots. It is a native of rich, damp woods, over most of the United States, and grows also in Japan and Manchuria. It was a favorite remedy in labor among some tribes of the North American Indians, as its vernacular names indicate.

The dried rhizome is thus described in the Pharmacopœia: "About four inches (10 cm.) long, and about one-fourth to two-fifths of an inch (6 to 10 mm.) thick, bent; on the upper side with broad, concave stem scars, and short, knotty branches; externally, gray-brown; internally, whitish, tough, and woody. Roots numerous, matted, about four inches (10 cm.) long, and one twenty-fifth of an inch (1 mm.) thick, rather tough; nearly inodorous; taste sweetish, slightly bitter, and somewhat acrid."

It contains twelve per cent. of resin and some tannin, a glucoside much resembling saponin, and a small amount of the alkaloid caulophylline.

The drug is irritating to mucous membranes, the powder being highly sternutatory. It is much like saponin in its local effects. It is recommended as a uterine stimulant, of service in parturition, and also as a stimulating emmenagogue, but there is little reliable information in regard to its action. There is no official preparation, but the fluid extract is the best form of administration, in doses of gm. 0.3 to 2.0 (gr. v.–xxx.).
Henry H. Rusby.

COLCHICUM.—*Meadow Saffron.* A genus of plants of the lily family (*Liliaceæ*), comprising about thirty species, one of which, *C. autumnale* L., yields two official drugs, namely, the corm (*Colchici Radix*) and the seed (*Colchici Semen*). As these drugs are identical in properties and use, and practically so in composition, they are considered together. The plant is a perennial herb, with a very short subterranean upright stem, arising from the apex of a corm, and having at its side another corm, younger or older according to the season.

The corm of colchicum, in the latter part of the summer, when it is usually gathered, is principally composed of that portion which has just done service in ripening the fruit. It is about 5 cm. long by 4 in width (2 × 1½ ins.), and enclosed in two brown papery coats. It is irregularly pear-shaped, rather pointed above, blunt and oblique at the base, and flattened and grooved on one side, where it clasps the new growth. At the apex is the scar or remains of the now decayed aërial vegetation. At the base, on the flattened side, is attached the new bud which is to produce the flower in the autumn, enclosed in the general coverings above mentioned. Later in the season the stem and flowers of the young bulbs form a column at the side of the old one, fitting into its flattened or grooved surface, and having the appearance of being simply a lateral bud of the older corm. During the following spring, however, the elder tuber shrivels away, and the new one, as its fruit ripens, becomes large and plump, and in its turn develops a junior for the succeeding fall.

Colchicum is a native of Middle, Southern, and Eastern Europe. It is frequent also in England, and is occasionally cultivated, for its pretty but sombre flowers, in this country. Our medical supply of the root comes princi-

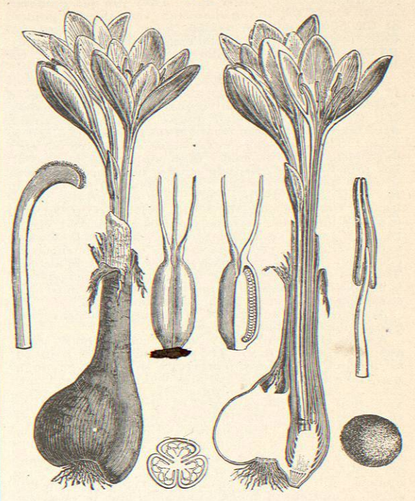

Fig. 1466.—Colchicum. Flowering plant, one-half natural size, and details of structure; also seed. (Baillon.)

pally from England and Germany. The corms are usually collected in midsummer, or shortly after, when they are the plumpest and finest looking. From this time until fall they do not change much, and if gathered when in flower would be probably equally good. They are sometimes used abroad in the fresh state; sometimes also dried whole. Usually, however, and always for this market, they are sliced and dried by the aid of gentle heat. Their quality is very sensitive to carelessness in drying. The seeds are simply collected and dried when ripe.

Colchicum has been known as a poison since the time of Dioscorides, but as a medicine only for the last two or three hundred years. Its first admission to the London Pharmacopœia was in 1618, and thirty-two years after it was dropped, and did not reappear in it until 1788, since which time it has been in regular employment (*Pharmacographia*).

Description.—*The Corm.*—The transverse slices into which the corm is cut are about 3 mm. (⅛ in.) thick, and from 1 to 3 cm. in diameter, according to their position. Their cut surfaces are white or grayish white, their edges (surface of the corm) brownish yellow. In shape they vary a little; those cut from the upper part may be simply round, but those of the middle and lower portions are flattened or indented at one side, where the flower buds lie, or they may even be typically kidney-shaped. The drug is occasionally sliced vertically, when the slices will be more or less ovate, and some of them longitudinally grooved. Even the whole corms are sometimes met with. They are hard, brittle, and loaded with starch. Taste very bitter and acrid, odor simply earthy.

That which is very dark colored internally, or breaks with a horny fracture (showing too much heat used in drying), should be rejected.

The *seeds* are of more modern use, having been introduced about sixty years ago. They are sub-globular, about 2 mm. ($\frac{1}{10}$ in.) in diameter, very slightly pointed at the hilum; surface reddish brown, finely pitted and dull; internally whitish; odor none; taste bitter and acrid; texture very hard, bone-like between the teeth, at the hilum a soft caruncle.

Composition.—The corms, in drying, lose two-thirds of their weight, and when about dry consist largely of starch, in fine rounded, by mutual pressure polyhedral, and sometimes compound grains. Sugar, gum, resin, fixed oil, etc., are other common substances contained in them. The seeds also contain sugar, resin, fixed oil, etc., as incidental constituents. Both contain, as their peculiar principle, the intensely active substance *colchicine*, in small quantity—in the "root" about 0.5 per cent., in the seeds about 0.3 per cent. It is also present in the leaves. Colchicine ($C_{15}H_5[OCH_3]_3[NHC_2H_3O][CO_2CH_3]$) is a very bitter and extremely poisonous alkaloid, occurring as a yellow, crystalline powder, soluble in both water and alcohol. It yields *colchiceine*, or aceto-trimethyl-colchicinic acid, in yellowish needles, soluble in alcohol. This also occurs free in the drug, and is poisonous. It is believed that these substances are not active until after oxidation has occurred in the alimentary canal.

Action.—The actions of colchicum, colchicine, and colchiceine differ only in degree.

All the effects are chiefly, and perhaps wholly, referable to local irritation. The skin is somewhat irritated, all mucous membranes powerfully so, sneezing, coughing, running at the eyes and nose being prominent symptoms of exposure to the dust. Its internal effects are very slow in developing, some hours usually elapsing, thus strengthening the theory of preliminary oxidation of the colchicine. Then nausea and pain in the stomach, with lassitude and salivation come on. If the dose is large enough, vomiting and purging follow, and these are characteristic of great irritation, the stools being mucous and perhaps bloody. Varying, and mostly slight, symptoms of reflex stimulation may be observed. In severe poisoning paralysis quickly follows, beginning at the lower extremities, proceeding upward, and killing by asphyxiation. It is generally believed that the latter effects are entirely dependent upon the irritation. Even if given hypodermically, the principle is excreted into the stomach and intestines, and the *modus operandi* is the same. In any case, the practical facts are that the characteristic effects of over-dosage are severe abdominal irritation and severe depression, both of which are to be avoided as much as possible in its medicinal employment. The effects upon the kidney are very irregular, depending apparently upon stimulation by small quantities, depression by larger ones. Lastly it may be noted that the irritant effects of colchicum are cumulative. They may be produced quickly by large doses, or gradually by continued small ones, so that its administration has always to be performed with watchfulness and care.

Use and Administration.—All the study of the action of colchicum is devoid of therapeutic value, as no relation can be seen between the former and its therapeutic use, which is almost exclusively in the treatment of gout. We only know that gout and all its sequelæ and dependent functional disturbances are markedly relieved by the administration of colchicum, which has for very long been regarded as a specific for that disease. All cases are not equally benefited, acute and the early stages of chronic ones being much more amenable. With long-continued administration, the drug gradually loses its effectiveness, and at the same time undesirable effects become more troublesome. The desirability of cautious administration thus becomes apparent. As soon as abdominal disturbances begin, the administration should be stopped for a while.

The forms of administration are very numerous. The powdered drug is often given in doses of 0.1 to 0.5 gm. (gr. ij.–viij.). The Pharmacopœia offers us an extract of the root, dose 0.03 to 0.13 gm. (gr. ss.–ij.), fluid extracts of each, dose ♏ ij. to viij., a 15-per-cent. tincture of the seeds, dose 0.6 to 2 c.c. (♏ x. to xxx.), a 40-per cent. wine of the root, dose 0.3 to 1 c.c. (♏ v. to xv.), and a 15-per cent. wine of the seed, dose the same as of the tincture. The presence of these two wines, of such dissimilar strength and dosage, is barbarous, and it is even to be hoped that the seeds and their preparations may be entirely dropped, or the strength of the preparations so adjusted that the dosage will be uniform. This could easily be done by alkaloidal standardization, as it is now certainly known that the two substances do not differ in kind. Colchicum corm and fluid extracts should contain one-half per cent., the extract two per cent., of total alkaloids, the other preparations proportionately with their strength. Colchicine is frequently given in doses of 0.0005 to 0.0022 gm. (gr. $\frac{1}{120}$ to $\frac{1}{30}$), colchiceine occasionally in maximum doses about half as large. Tannate of colchicine is somewhat used in doses about twice as large as those of colchicine itself.

Henry H. Rusby.

COLCHICUM, POISONING BY.—Colchicum autumnale, or meadow saffron, order *Liliaceæ*, is a biennial plant, a native of Europe. It is not found in America. It is nearly related to veratrum. All parts of the plant are poisonous, but only the corm and the seeds are used medicinally, being most active in the second season. This plant is said to have been known to Dioscorides and to have been first used by Medea. The active principle is the intensely bitter and poisonous alkaloid colchicine, discovered by Pelletier and Caventon. Its usual form is a white or yellowish, amorphous powder; sometimes it occurs as crystals. It is alkaline in reaction, and is soluble in water, acids, spirits, ether, chloroform, and benzene. It is frequently an ingredient of quack medicines for rheumatism and gout and is sometimes put into beer. Of the preparations, those of the seeds are the more reliable. There are in the United States Pharmacopœia: an extract of the root, a fluid extract of the root and of the seeds, a wine of the root and of the seeds, and a tincture of the seeds.

Fatal Dose of the Alkaloid.—Casper quotes this to be from 25 to 30 mgm. (gr. 0.385 to 0.463). However, according to Blyth, there is a recorded recovery from 70 mgm. (gr. 1.08).

Symptoms.—The poison is slowly absorbed, and the symptoms generally continue after the drug has been stopped, while relapses are not uncommon. The patient usually feels a burning pain in the gastro-intestinal tract, with great abdominal pain, griping, nausea, vomiting, and diarrhœa, although cases have been noted with no diarrhœa. The stools abound in bile and are sometimes bloody. Dysuria and hæmaturia have been recorded. The respiration and pulse are much depressed. The temperature falls, and muscular weakness supervenes. There may be cramps in the feet and calves. The brain is rarely affected. In severe cases, however, stupor occurs followed by early collapse and death. Convulsions sometimes take place. As indicated above, death does not occur at once, the symptoms in many cases lasting as long as six or seven days and even longer. If the patient recovers, it is only after a tedious convalescence. In certain cases the patient suffers from chronic diarrhœa after the other symptoms have passed away.

Treatment.—The use of the stomach pump is indicated, or emetics may be used, *e.g.*, ipecacuanha, zinc sulphate, mustard; or apomorphine, administered hypodermically in doses of four or five drops. Mucilaginous drinks and abundance of water are beneficial. Tannic acid neutralizes the poison and is an antidote. The bowels should be cleared out by castor oil, while the abdominal pain is quieted by morphine or opium. Heat applied to the extremities and abdomen also relieves pain. For the depression, stimulants should be employed.

Test.—If to the alcoholic solution of the alkaloid, ferric chloride be added there will result a garnet red; while

if an aqueous solution be used, the color obtained will be green or brownish green. If a combination of the solid substance and nitric acid be made, a violet hue will develop. Colchicine may be extracted from a feebly acid aqueous solution by chloroform.

Post-Mortem Appearances.—Hyperæmia is the most striking of these, and has been observed in the mucous membrane of the gastro-intestinal tract, in the kidneys, lungs, articular joint surfaces, bone-marrow, brain, and cord. Degeneration of the liver has been reported. As in sulphuric-acid poisoning, the large veins are filled with thick dark-red blood. The stomach contents give an acid reaction. The pathological changes, however, are not constant.

Separation of Colchicine from Organic Matter.—Obolouski's method: The viscera are finely ground with powdered glass, and the mixture left in alcohol for twelve hours, after which the liquid is removed and the residue is washed in alcohol. This extract is heated to a temperature not above 80° C. The concentrated product is cooled and mixed with enough alcohol to equal the original quantity. The liquid is filtered and evaporated as before, and this process is repeated until, on the addition of water, there is no further separation of clots. The final residue is dissolved in water, purified by shaking with light petroleum, and at last the colchicine is extracted with chloroform.

Emma E. Walker.

COLD, EFFECTS OF. See *Camp Diseases.*

COLD IN THE HEAD. See *Nasal Cavities, etc.*

COLD SULPHUR SPRING.—Rockbridge County, Virginia.

Post-Office.—Goshen Bridge. Hotel.

Access.—Viâ Chesapeake and Ohio Railroad to Goshen, thence a drive of 2 miles to springs. Hacks meet all trains.

The Cold Sulphur Springs are located in the mountains of Virginia, at an altitude of two thousand feet above the sea level. The situation is near the centre of the celebrated mineral-spring region, so long noted for the beauty of its scenery and the salubrity of its climate. Recent additions to the hotel building have greatly increased its capacity, and many improvements have been made for the comfort of guests. The location is encompassed on every side by lofty mountains of rare loveliness and grandeur, and the beautiful lawn, with its vast shade of primeval oaks, forms a picture of alluring restfulness and tranquillity. Within a few minutes' drive is the west entrance to the Goshen Pass, the gateway through which the north branch of the James River finds its way to the sea—a spot famous for its wild and magnificent scenery. The water of the Cold Sulphur Springs is clear and slightly sparkling from the gases which it contains. It has a temperature of 50° F. as it flows, and the presence of a large amount of free carbonic acid renders it peculiarly light and grateful both to the taste and to even a delicate stomach. The water has been analyzed with the following results by a chemist whose name is lost:

One United States Gallon Contains:

Solids.	Grains.
Calcium sulphate	2.90
Magnesium sulphate	0.58
Aluminum sulphate	2.46
Sodium sulphate	0.65
Calcium carbonate	1.85
Magnesium carbonate	1.78
Iron carbonate	1.22
Sodium silicate	1.48
Calcium chloride	0.42
Lithium chloride	Trace.
Phosphates	Trace.
Organic matter	0.33
Total	13.67

Gases.	Cubic inches.
Sulphureted hydrogen	253.00
Carbonic acid	5.65

This analysis shows a mild alkaline-chalybeate. If the figures are correct it contains an unusually large quantity of sulphureted hydrogen. The effects of the water are tonic and sedative. It is used with good effects in diseases of the stomach, bowels, liver, and kidneys. The resort is well provided with facilities for the accommodation, comfort, and amusement of guests.

James K. Crook.

COLD, THE THERAPEUTICS OF.—Heat and cold are two relative modes of molecular motion. We call an object warm or cold when it possesses more or less molecular motion than our bodies contain. According to a fundamental law of physics, motion takes place in the line of least resistance, and since a greater quantity of motion offers more resistance than a smaller quantity, it follows that motion, unless impeded, always tends in the direction of lesser motion, or, in other words, from heat toward cold. If the animal body, therefore, comes in contact with a colder medium, it loses a certain amount of its heat; and if the surrounding temperature is sufficiently low and if it remains so for a sufficient length of time, enough heat is extracted to threaten and even to extinguish life. We may hence conclude that while cold acts as an antipyretic, it also acts as a depressant. On the other hand, when cold is applied fugitively, or for a short time, it has a stimulant and tonic effect. This duplex action of cold is demonstrated by the following observations: Liebermeister ("Beobachtungen und Versuche über die Anwendung des kalten Wassers bei fieberhaften Krankheiten," Leipsic, 1868), and Kernig (Reichert's *Archiv*, 1860) found by actual experiment that brief exposure of healthy persons to cold baths elevates the temperature, while on the clinical side it has been abundantly proven that prolonged exposure of fever patients to cold invariably reduces the temperature.

That a healthy body may have its temperature elevated by transient exposure to cold, and that a fevered body may suffer depression of temperature if exposed to cold, are facts which accord with another physical law, viz.: that action and reaction are equal. A healthy body is momentarily thrown out of its accustomed equilibrium by the aggressive force of cold, but in virtue of its greater inherent strength and resistance it is soon enabled to react on and to neutralize the influence of this disturbance, and while undergoing this greater activity its temperature is elevated. On the other hand, the fevered body possesses less resistance and is too feeble to offer much resistance to the aggressive action of cold, and hence the latter readily depresses the abnormally augmented activity of the body. Cold may, therefore, be an antipyretic or a stimulant according to the circumstances under which it acts; thus showing that, like all our therapeutic agents, its effects are controlled by the dose and by the length of time during which it is administered. Additional cold also contracts and condenses bodily tissue, and thus incidentally it has the power of contracting blood-vessels—a property of considerable therapeutic importance.

Physiologically it may be said then that cold acts (1) as an antipyretic; (2) as a tonic or stimulant; and (3) as a contractor of the blood-vessels, by which means it lessens the supply of blood.

Methods of Applying Cold.—It has already been shown that the effects of cold depend on the manner in which this agent is applied, and it is therefore necessary briefly to consider the different modes of its application together with the physiological effects of each.

Wet-Sheet Application.—A cotton or linen sheet is wrung out of water having a temperature of 80° or 90° F.; it is then wrapped around the patient's body, and is allowed to remain for two, three, or four minutes. If the patient is in a feeble condition, vigorous friction must precede and follow the application of the sheet. The temperature of the water may be gradually lowered as the patient becomes accustomed to the influence of cold. Used in this way the wet sheet takes the place of a cold bath in a certain class of invalids, relieves fatigue and nerve depression, and invigorates vital energy.

Spinal Bath.—Water at a temperature of 80° F. and gradually cooled is poured from a jug or can, or pressed