and deep-seated from the beginning, extensive operative treatment is not advisable. Some think it best to remove as many glands as possible, even though the glandular enlargement is general, in the hope that medicinal treatment may better control the disease. The results obtained do not warrant the procedure. All cases, chronic in character, with a tendency to localization of the process, should be treated by removal of the growths, supplemented by the administration of arsenic. Operation is indicated when accessible growths produce serious pressure symptoms. In most cases the glands are easily removed. In some cases, however, adhesions are firm and extensive. The results obtained by splenectomy in the splenic variety of the disease are exceedingly gratifying. A removal of the spleen should be seriously considered in all cases in which the diagnosis is certain, and the progress of the disease is apparently toward a fatal termination. Recovery has followed splenectomy in such cases, even after cachexia was advanced.

Bertram W. Sippy.

HOLARRHENA.—*Conessi* or *Tellicherry Bark.* The bark of *H. antidysenterica* Wall. (fam. *Apocynaceæ*), a woody plant of India. It is one of several plants whose barks have gone under the name of "Kura" or "Kuda" in India. The active constituent is an alkaloid which has been called *Wrightine* ("conessine"), and there is some doubt about its identity with what has been regarded as the same from other sources. It is contained also in the seeds. The bark appears to be a carminative and intestinal astringent, and the alkaloid somewhat antiperiodic. It is very largely used in native practice in India as an antidysenteric, and has been considerably so used in Europe. Reports as to its efficacy are discordant, but its use has declined. An aqueous extract is used in three-grain doses. *Henry H. Rusby.*

HOLOCAIN, para-diethoxy-ethenyl-diphenyl-amidin hydrochloride $[(C_6H_4.O.C_2H_5)_2.NH.C.CH_3:N.HCl]$, is obtained by the union of molecular quantities of phenacetin and paraphenetidin with separation of water. It crystallizes in bitter, white needles which are freely soluble in alcohol and ether and in forty parts of water. It is not affected by a temperature of 212° F. (100° C.). With alkalies it is decomposed and precipitated, the presence of a calcium salt in the water used for solution being sufficient to produce turbidity. It attacks any free alkali in glass; so, to prevent precipitation, the glass container should previously be boiled with acid.

Holocain has a deleterious effect on protoplasm, as in 0.1-per-cent. solution it stops fermentation and putrefaction, in 0.5-per-cent. solution it arrests the development of germs, and in one per cent. it stops amœboid movements and kills most micro-organisms. Hence the solutions are sterile, though if desired they may be boiled without harm. Holocain paralyzes the sensory nerve endings, and is a local anæsthetic of great power. It is claimed by Hotz, Wurdemann, Knapp, Jackson, and others to be quite as anæsthetic in the eye as cocaine, quicker in its action, and its effect more lasting, and as it is more penetrating the iris is more anæsthetized. It does not dry the cornea, increase intraocular tension, or influence the pupil or accommodation. Neither does it constrict the vessels, and, on the contrary, it tends to produce slight hyperæmia. This comparison with cocaine can be well demonstrated by dropping cocaine solution in one eye, and holocain solution in the other eye of the same patient. The amount used for eye work is two to five drops of one-per-cent. solution, and in one-half to two minutes this produces anæsthesia lasting ten to fifteen minutes. Derby and Knapp recommend it for the removal of foreign bodies as it leaves so little effect on the eye. They also find it the most serviceable drug in corneal ulcers of microbic origin, and in purulent ophthalmitis. Holocain cannot be used like cocaine by hypodermic for local anæsthesia, as it is much more toxic, its action in overdose resembling that of strychnine (Heinz).

W. A. Bastedo.

HOLZIN, HOLZINOL. See *Formaldehyde.*

HOMATROPINE.—Atropine and hyoscyamine when decomposed break up into tropic acid and tropin. The latter when combined with mandelic acid forms homatropine; mandelic acid being the product of the action of hydrochloric acid on amygdalin. Homatropine combines with acids to form salts; the hydrobromide, hydrochloride, and salicylate are those most employed. The hydrobromide is official in the British Pharmacopœia. Pure homatropine is almost insoluble in water but is slightly soluble in oil and vaseline. A two-per-cent. solution in oil and gelatin discs are prepared for ophthalmic work. The advantage claimed for the solution in oil is that it is not so readily washed from the eyes by the tears. Homatropine is weaker in its action than atropine and when administered internally acts in much the same manner as does the more common alkaloid. It is said to differ from the latter in this respect, viz., it causes a slowing of the pulse, but this difference is not marked when large doses are administered. The dose of the hydrobromide as given by the British Pharmacopœia is from one-eightieth to one-twentieth of a grain. It has been recommended for use in all conditions in which atropine is indicated, particularly in the night sweats of phthisis. It, however, has not been much employed, as it has not proved so trustworthy as atropine.

Homatropine is almost entirely employed as a mydriatic in ophthalmic work. Its action is much less intense than that of atropine, but it dilates the pupil and paralyzes the ciliary muscle almost as rapidly, and its effects pass off in a much shorter time. The pupil begins to dilate in ten or twenty minutes and paralysis of accommodation is complete in about one hour. In from twelve to twenty-four hours its action is quite recovered from. A one- or two-per-cent. solution is used. *Beaumont Small.*

HOMBURG, GERMANY.—This popular watering-place is situated in the Rhine land, ten miles north of Frankfort-on-the Maine. It is reached from Paris, from which it is 477 miles distant, direct by rail, or viâ Cologne and the Rhine.

The town is built on a spur of the Taunus Mountains at an elevation of 643 feet above sea level. Its natural situation is not picturesque, but art has done much in the way of beautiful pleasure grounds, extensive parks, and promenades. It contains 9,278 inhabitants and is annually visited by 10,600 persons, forty per cent. of whom are said to be foreigners, including a large number of English. Homburg has been one of the favorite resorts of the late Prince of Wales, now King of England.

The mineral springs and sanatoria are in a large Kurpark which extends toward the northeast into the forests of the foothills of the Taunus.

The climate is that of Central Germany, the average yearly temperature being 47.5° F.; and for summer, May, 56.3° F.; June, 66.2° F.; July, 65.6° F.; August, 66.5° F.; September 56.3° F. The yearly rainfall is 26.6 inches. The season extends from May to the end of September.

The waters of Homburg are saline-chalybeate, and are derived from the Taunus schist and quartzite. The principal constituents are the chlorides of sodium, calcium, magnesium, and lithium; the carbonates of iron and calcium; and free carbonic acid. Unlike the waters of Ems, they are cool and have to be artificially heated when used for baths. They come under the general classification of common salt or muriated waters and are similar to those at Wiesbaden, Kissingen, Baden-Baden, Kreuznach, and Nauheim.

There are seven springs, as follows, with their temperatures: Elizabethbrunnen, 51.1° F.; Ludwigbrunnen, 53.4° F.; Louisenbrunnen, 52.1° F.; Landgrafenbrunnen, 51.8° F.; Kaiserbrunnen, 52.9° F.; Stahlbrunnen, 51.8° F.; Soolsprudel, 51.8° F.

The Louisenbrunnen and Stahlbrunnen are distinguished by their excess of carbonate of iron. All these

springs are used for drinking except the Soolsprudel and Landgrafenbrunnen.

The Ludwigbrunnen, Kaiserbrunnen, Louisenbrunnen, and Soolsprudel are used for bathing, the water being warmed by hot steam chambers at the bottom of the baths, with the least possible escape of carbonic acid gas. The waters of the Ludwigbrunnen are used for inhaling. All the springs are the property of the town of Homburg, which has erected the various bath-houses: the Kaiserbrunnen with sixty bathrooms, and two piscinæ for natural carbonic-acid salt baths; mud baths and mineral and fresh-water baths: Kurhausbad with thirty-three bathrooms. In the former 26,147 baths were given in 1899, and in the latter over 7,000. In the Kaiser Wilhelm's bath are inhalations with spray produced by compressed air.

Besides the mud baths mentioned there are pine-needle, electric, medicated, and steam baths; and there are also good facilities for Swedish gymnastics and massage, as well as for the milk and whey treatment.

The chief centre for visitors is the Kurhaus, containing handsome apartments, reading-room, etc., with a terrace partly covered with glass, and corridors, affording a sheltered promenade. At the back of this Kurhaus extend the beautiful pleasure grounds, with a palm-house, orangery, and well-kept flower beds.

The town contains water-works, a sewerage plant with facilities for filtration, and a steam disinfecting apparatus.

Therapeutics.—When these waters are taken internally they gently stimulate the gastric and intestinal mucous membrane, at the same time rendering the contents of the bowels more fluid; they are therefore beneficial in catarrhal affections of the alimentary tract. Taken in small quantities they are constipating, but laxative in larger quantities. They help to increase the general nutrition, according to Weber, by their action in aiding the digestion of albuminous materials.

According to the same authority, they often increase the weight in thin persons, and for such cases are preferable to the alkaline-sulphated waters.

They are also beneficial in catarrhal affections of the respiratory tract; in gout, uric-acid diathesis, obesity, hemorrhoids, diseases of women, heart disease, and malaria. Those springs containing iron are useful in cases of anæmia and chlorosis.

Fifty-five thousand litre bottles of these waters are yearly exported. *Edward O. Otis.*

HONEY.—Mel. "A saccharine secretion deposited in the honeycomb by *Apis mellifica* L. (class, *Insecta;* order, *Hymenoptera*)" (U. S. P.). For the collection and sources of honey, the reader is referred to the article *Wax.* Freshly separated from young or "virgin" combs it is a pale yellow, or greenish-yellow, or light sherry-colored liquid, about as thick as glycerin, of peculiar odor, and of very sweet and slightly sharp taste. All these properties vary with the conditions of its collection, such as season, the prevailing flowers, climate and country, and (but not in commercial honey) the species of insect producing it. The honey of older combs is darker colored and more disagreeable. With age, after removal from the combs, it becomes darker, and granular from the formation of crystals of sugar in it. Specific gravity 1.430 to 1.440. The following tests and reactions are from the Pharmacopœia:

"When recent honey is diluted with two parts of water, the resulting liquid should be almost clear, not stringy, and should have a specific gravity not lower than 1.100 (corresponding to a specific gravity of 1.375 for the original honey).

"Honey has a faintly acid reaction toward litmus paper.

"If one part of honey be dissolved in four parts of water, a clear or nearly clear solution will result, which should not be rendered more than faintly opalescent by a few drops of silver nitrate T.S. (limit of *chlorides*), or of barium chloride T.S. (limit of *sulphates*).

"If one volume of honey be diluted with one volume of water, and a portion of this liquid gradually mixed with five volumes of absolute alcohol, it should not become more than faintly opalescent (as compared with the reserved portion of the solution), and should neither become opaque nor deposit a slimy substance on the inner walls and bottom of the test tube. And when honey is incinerated, in small portions at a time, in a platinum crucible, it should not leave more than 0.2 per cent. of ash (absence of *glucose* and *foreign inorganic substances*).

"On boiling one part of honey with five parts of water, the resulting solution, when cold, should not be rendered blue or green on the addition of iodine T.S. (absence of *starch*)."

Of this, the Pharmacopœia provides a clarified form, under the title "*Mel Despumatum*, or *Clarified Honey*," which is required to respond to the above tests and which we are directed to prepare as follows:

"Mix the honey intimately with *two* (2) *per cent.* of its weight of paper pulp, which has been previously reduced to shreds, thoroughly washed and soaked in water, and then strongly expressed and again shredded. Then apply the heat of a water-bath, and, as long as any scum rises to the surface, carefully remove this. Finally, add enough distilled water to make up the loss incurred by evaporation, strain, and mix the strained liquid with *five* (5) *per cent.* of its weight of glycerin."

Composition.—Honey is a solution of several sugars in water, together with minute quantities of several acids (lactic, acetic, etc.), coloring matter, mucilage, albuminoids, and the odorous principles. Occasional pollen cells are seen in it, and, when old, crystals of sugar. The sugar of honey is principally *levulose*, or uncrystallizable fruit-sugar, but *dextrose* and even sometimes *saccharose*, or cane-sugar, are also present; *mannit* has been observed. In old honey these crystalline sugars (which perhaps increase in it with age at the expense of the levulose) are the cause of its granulating. The result of six analyses by König were: fruit-sugar, 78.74 per cent.; cane-sugar, 2.69 per cent.; nitrogenous substances, 1.29 per cent.; water, 16.13 per cent. (Hager).

Poisonous substances are frequently found in honey, apparently collected by the bees. Their origin has sometimes been traced to *Rhododendron* and other members of the *Ericaceæ*, but no method of detecting them, except by eating, has been found. The poisoning is usually mild, but numerous fatal cases have been recorded.

Uses.—The employment of honey as an article of food and luxury, as well as a medicine, is of great antiquity, and extends over nearly every temperate country on the globe. In the tropics the bees are less provident, and honey is not so regularly collected. But, in spite of this popularity, honey has no medicinal value beyond that of sugar or syrup, and can be considered only a vehicle for other medicines. Partly as a convenience on account of its taste and consistence, and in part from deference to tradition, it has been used in numerous preparations; it is still official in the Honey of Rose (*Mel Rosæ*, U. S. P.), made by mixing 12 parts of a fluid extract of red rose (vehicle, diluted alcohol) with 88 of honey. It is simply a pleasantly astringent vehicle. Confection of rose contains twelve per cent. of honey. *W. P. Bolles.*

HONTHIN is a tasteless and odorless compound of tannin, keratin, and albumin, which is said to pass through the stomach unchanged, and to be separated into its constituents in the intestine. It is an intestinal astringent, is insoluble in water, and may be given alone or with chalk mixture for diarrhœa or intestinal fermentation (Reichelt, Frieser). *W. A. Bastedo.*

HOOF-AND-MOUTH DISEASE.—Hoof-and-mouth disease, also known as foot-and-mouth disease, is spoken of technically as epizootic aphtha, and has also been called eczema epizootica, vesicular aphtha, vesicular epizootic

(The author acknowledges his indebtedness for many of the above facts to "Deutschlands Heilquellen und Bäder," herausgegeben vom Kaiserlichen Gesundheitsamt zu Berlin, Berlin, 1900.)

and aphthous fever; among the ignorant the term murrain is sometimes used.

In France it is officially known as *fièvre aphtheuse*, and is also spoken of as *stomatite aphtheuse* and *cocette*. The Germans call it *Maul- und Klauenseuche, Maulfaule, Aphtheseuche, Bläschenkrankheit*, and *Maulweh*. In Italy it is known as *afta epizootica, febbra aftosa*, etc. In the far East it is also found, being called in Bengalee *Homsa, khoorea, khoora, khoraha*, and other names; in Thibet it is known as *khuchha*, and in Singalese as *kata ledé* and *kura ledé*.

Hoof-and-mouth disease is peculiar to the cloven-footed domestic animals, the ox, sheep, goat and swine, but may be communicated by them to the horse, dog, cat, and poultry, and also to man. It is this latter property that renders it of special interest to the practitioner of human medicine. It may also occur among wild ruminants, such as deer, buffalo, camel, llama, giraffe, and antelope.

Hoof-and-mouth disease in cattle, sheep, and swine is characterized by a vesicular eruption of the mucous membrane of the mouth and under surface and edges of the tongue, the interdigital space and around the top of the foot at the juncture of the hair and horn, followed by ulceration as the vesicles break, and accompanied by high fever.

It is highly infectious, being disseminated not only by the cohabitation of sick with healthy animals, but also by manure, litter, stable utensils, the clothes and boots of attendants and veterinary surgeons, and by cattle cars. Even driving healthy cattle over roads previously traversed by cattle suffering from the disease is sufficient to produce it in the non-infected animals.

Milch cows suffering from hoof-and-mouth disease also have a vesicular eruption upon the udder and teats, and in these cases the milk becomes a medium of infection.

Hoof-and-mouth disease has undoubtedly existed for centuries, probably for the last two thousand years; it seems to be a native of Western Asia and Eastern Europe, and has long been known in India and upon the steppes of Russia. As commerce between civilized nations increased and means of communication developed, it spread over Europe from the east to the west until now it prevails from the Caspian Sea to the Atlantic Ocean. It also exists in India, Ceylon, Burmah, and the Straits Settlements. With the development of literature its description became more accurate and accounts of its spread over Europe in the seventeenth and eighteenth centuries show it to have prevailed extensively in Italy, Germany, and France. Toward the end of the eighteenth and early in the nineteenth century it reached Western Europe, but did not gain access into England until 1839, and was not known in Denmark until 1841.

Hoof-and-mouth disease seems to be a native of localities in Eastern Europe or Western Asia, and an exotic in some other countries. For example it was imported into Canada in 1870, being introduced by two Shorthorn cows brought from Liverpool, and appeared in localities in New York State and some of the New England States; but it does not seem to have assumed a severe form and in a few months entirely disappeared, and to-day it does not exist upon the North American continent. Its behavior in thus disappearing may be in part due to its having been introduced in the autumn, and as cattle in the North are housed during the winter months there is very little communication between herds; but it may also in part be due to its exotic character. The last outbreak in the United States was in the early eighties (about 1884), when some cattle imported from England were landed at Portland, Me., and driven to the United States quarantine station a short distance away. Soon after a yoke of oxen was driven over the same road, which later developed hoof-and-mouth disease,—the imported cattle having it when landed,—and gave it to the owner's herd; but the disease was soon suppressed, and there has been no reappearance of it since.

The United States Bureau of Animal Industry, of the Department of Agriculture, spares no pains to protect the live-stock interests of the country from contagious animal diseases; hence it is unlikely that this malady will ever secure a foothold here, owing to the stringent quarantine regulations imposed by the federal Government. Cattle, sheep, swine, and other ruminants can be brought into the United States only at points designated by the Department of Agriculture, the ports of entry on the Atlantic seaboard being only at Boston, New York, and Baltimore, near which places quarantine stations have been established. All neat cattle are held at these stations for ninety days, and all sheep and swine for fifteen days after landing. The reason for holding cattle longer is to guard against contagious pleuropneumonia; the period for which the sheep and swine are held is sufficient to guard against all danger from hoof-and-mouth disease. Neat cattle also have to be found free from tuberculosis as determined by the tuberculin test before being allowed to go beyond the quarantine station limits. Separate gates and lanes are provided for entrance and exit; if, therefore, any contagious disease should make its appearance, there would be no danger of healthy animals becoming infected by being driven over roads where sick animals had previously been.

Importers of animals from England or Europe must also obtain permits from the Department of Agriculture, and furthermore must have affidavits that animals come from localities free from contagious diseases, and do not pass through infected districts in transit. The collector of the port of entry is notified when the animals arrive, and immediately turns them over to the care of the agent of the Bureau of Animal Industry having charge of the quarantine station.

In countries where hoof-and-mouth disease has prevailed as an epizootic, the losses occasioned by it have been very great to the farmer from a pecuniary standpoint; not that the mortality is very large, as only from one to three per cent. of the infected animals die, but owing to the emaciation due to the fever, and the inability to walk about and eat. This loss is especially heavy when cattle or sheep are being fed for the shambles. Animals nearly ready for the butcher in a few days lose all the flesh that it has taken them months to put on.

Neat cattle have the severest lesions in the mouth, as a rule, and have great difficulty in eating, although lameness may also be present, while among sheep the foot lesions are usually the more severe and they will not walk about in search of food, but spend most of their time lying down.

In Great Britain, after its introduction in 1839, there have been several epizootics of hoof-and-mouth disease. Professor Brown has classified them as the ten great outbreaks, but it seems to have been pretty well subdued there, as from 1886 to 1896 only 1,295 cattle, 3,673 sheep, and 107 swine have been reported as having it, and during 1897 no authentic cases were reported. These results have been brought about only by the most strenuous efforts; when an outbreak has occurred public live-stock markets were closed, infected cattle quarantined, cars and premises disinfected, litter destroyed, and every precaution taken to check the spread of the disease. The results have amply justified the means adopted. Previous to 1886 the occasional great outbreaks assumed very large proportions. For example, in 1871 there were 700,000 cases among cattle in England with 7,000 deaths (one per cent.), and an equally bad outbreak occured in France at the same time. While it seems to have been nearly eradicated in Great Britain, epizootic aphtha still prevails extensively on the Continent with occasional sudden increases, in spite of a good sanitary veterinary police system in every European country. For example, in Belgium, in 1897, there were 2,453 cases of hoof-and-mouth disease; in 1898, 15,553; in France there were 1,601 outbreaks in 1897, and in 1898, 9,458; and in Italy 3,216 cases in 1897, and 45,497 in 1898.

In Hungary, in 1896, 572,809 cattle, 178,612 sheep, and 82,931 hogs were infected, while in 1897 it was diminished to 70,491 cattle, 25,450 sheep, and 3,758 hogs.

In the pig, as in the sheep, the lesions are manifested chiefly on the feet, although there may be eruptions on

the snout and free borders of the lips. Sows suckling young may have an eruption on the mammæ and teats, but in the sow and ewe this is not so frequent as in the cow. Young pigs infected through milk have the mouth and intestinal lesions, and in a severe form.

The period of development from the time of exposure is short, usually from three to eight days; but it may not appear in rare instances, it is said, for from two to three weeks.

When there are no complications, such as sloughing of the feet as seen in very severe cases, the disease in cattle, sheep, and swine runs a course of from ten to twenty days.

In other animals the symptoms are somewhat the same, viz., vesicles followed by ulcerations either on the feet or in the mouth; but other domestic animals do not seem to be very susceptible. The horse shows lesions in the mouth, but only as a result of licking infected cattle or drinking or eating from buckets or troughs which diseased creatures have used. Dogs, cats, and rabbits may have the disease, but it is said to be infrequent, and, in the dog and cat, is the result of their being kept in the stable with infected ruminants or swine, or of their drinking milk from cows with udder lesions.

It is said to be rare in poultry and birds; when it occurs there may be vesicles or sores on the feet and legs, or in the mouth and upon the comb.

Hoof-and-mouth disease may occur in the human family. Among adults, attendants of cattle, veterinary surgeons, butchers, and drovers are most exposed. It may be acquired from diseased animals, and occasionally it is possible for one person to infect another. Among infants it may be caused by drinking uncooked milk from cows having the vesicles of epizootic aphtha on the udder; it is also said that fresh butter, fresh cheese, and whey can convey the germs of the disease.

The period of incubation is quite short, especially when conveyed by milk, in which case it is only from twelve to twenty-four hours before symptoms appear.

In infants the disease is not infrequently fatal. The symptoms consist of fever, headache or dizziness, conjunctivitis, an eruption on the face or around the mouth, and vesicles in the mouth, and among milkers there may be sores on the tips of the fingers around the finger nails (there may even be sloughing of the nails), or in the spaces between the fingers. When vesicles develop in the pharynx they cause great difficulty in swallowing; there may also be vomiting and diarrhœa when the infection takes place through milk, and in the case of infants and small children the disease may then end in death. Recovery usually takes place in ten or twelve days. Among animals it is said that one attack does not always secure immunity from another. Meat from animals suffering with epizootic aphtha has never been found to be infectious.

Etiology.—Hoof-and-mouth disease is undoubtedly a germ disease—both clinical and experimental evidence indicate this,—but the specific organism which produces it remains to be discovered. There are other diseases which we believe to be due to a microscopic organism of some description—such, for example, as rabies, smallpox, and cowpox,—in which the organism is so minute or so difficult to stain or cultivate that it has hitherto not been demonstrated, and the bacterium of epizootic aphtha is unquestionably one of this character. Nosotti, Klein, Schottelius, and Kurth have studied micro-organisms found in connection with the lesions of hoof-and-mouth disease, but it does not seem that the true specific cause has yet been discovered.

The vitality of the virus is not considered to be usually very great. Walley says that as a rule the danger ceases at the end of thirty days after the recovery of the last animal, but instances are given in which troughs, hayracks, and stables have caused fresh outbreaks after the lapse of several months. Therefore, in taking steps for the eradication of the disease, thorough disinfection of stables and utensils, with destruction of all litter and manure, cannot be too strictly enforced.

The post-mortem conditions found in animals suffering from hoof-and-mouth disease—in addition to the lesions in the mouth and around the feet, and eruptions on the udder previously mentioned—consist of an inflammation of the stomach and intestines, with perhaps erosions of these organs. Especially is this the case in infants, pigs, and calves infected by the use of milk from diseased cows.

The medicinal care of hoof-and-mouth disease consists in treating the symptoms as they occur, by the use of antiseptic washes, and by the application of dusting powders to the ulcerations. The food should be soft and of an easily digested character. Large flocks of sheep, where it is impossible to attend to each individual case, are sometimes treated, when the foot lesions predominate, by driving the entire flock daily through a long wooden trough containing some antiseptic drying powder.

Hoof-and-mouth disease may be confounded with other diseases if care is not exercised in making a diagnosis, such as foot root in cattle or sheep, cowpox, and poisoning with corrosive agents.

In 1884 there was an enzootic of ergot poisoning among cattle in Kansas which was mistaken at first for an outbreak of hoof-and-mouth disease (*vide* first annual report of the United States Bureau of Animal Industry, 1884).

The horse suffers at times from a contagious stomatitis which is known as *stomatitis pustulosa contagiosa*, and which has been mistaken for epizootic aphtha. This disease is not rare in the Eastern United States, while hoof-and-mouth disease, it must be remembered, does not exist on this continent. The contagious stomatitis of the horse is readily communicated from one to another, but is not serious and soon disappears from a stable. It is characterized by the formation, inside the cheeks and lips, of numerous little vesicles which break in a few days, leaving small superficial ulcers which soon heal.

More extended information on hoof-and-mouth disease may be obtained by referring to the first edition of the Reference Handbook of the Medical Sciences, Walley's "Four Bovine Scourges," Fleming's "Veterinary Science and Police," Williams' "Theory and Practice of Veterinary Medicine," Hayes' translation of Friedberger and Fröhner's "Veterinary Pathology," and the annual reports of the United States Bureau of Animal Industry.

Austin Peters.

HOPS.—Humulus Lupulus. The carefully dried strobiles of *Humulus Lupulus* L. (fam. *Moraceæ* ["*Urticaceæ*," U. S. P.]), bearing the whole of their natural glandular coating. The hop vine is a twining perennial, with a thick-branched root, from which several long, slender, herbaceous, but tough and rough hairy cylindrical stems arise.

Description.—Ovoid-cylindrical, about 3 cm. (a little more than an inch) long, consisting of a thin, hairy, flexuous rachis and many obliquely ovate, blunt, membranaceous, rigid, glandular scales, which are parallel-veined below, reticulately veined above and each bearing a globoidal akene near the base; color of scales yellowish-green to greenish pale-brown, free from reddish or brown spots; odor strongly and peculiarly aromatic; taste bitter, pungently aromatic, slightly astringent.

Since the glandular coating (*Lupulin*) referred to in the definition contains the most of the active constituents, it should be present in normal amount, but much of the hops of the market have been deprived of a part of it by abrasion. Such hops are apt to be much broken, and are commonly pressed into cakes to conceal this appearance.

Good hops should be not much broken, and fresh. They are then of a rich, slightly yellowish or brownish green. When distinctly brown and dull, and especially shrivelled, they are stale and their composition is not the same.

The hop is a native of the temperate parts of the Old World—Europe and Asia—and grows in many places in the United States apparently wild, but probably introduced. It has been cultivated since the middle ages in Europe, and is now grown in nearly all temperate coun-

tries. England and the United States produce it abundantly, and of excellent quality.

The medicinal consumption of hops is comparatively small, and an unimportant item of the immense demand

FIG. 2706.—Hop Plant in Fruit. (Baillon.)

for them, mainly for flavoring ales and beers, which consumes many millions of pounds annually.

COMPOSITION.—The entire hop, that is, inclusive of the *lupulin*, contains the following substances: Nearly one per cent. of volatile oil, of a greenish-yellow color, becoming brownish with age, and of a specific gravity of .855 to .880. It becomes at least partly converted into isovaleric acid. A very small amount of the intensely bitter *lupamaric acid* ($C_{28}H_{38}O_4$), which is soluble in alcohol or a mixture of alcohol and water. Resin, up to fifteen or eighteen per cent.; tannin two to four per cent. Small amounts of asparagin and cholin. Not more than ten per cent. of ash is allowable upon incineration. According to their staleness, more or less *phlobaphene* may be present, at the expense of the disappearing tannin.

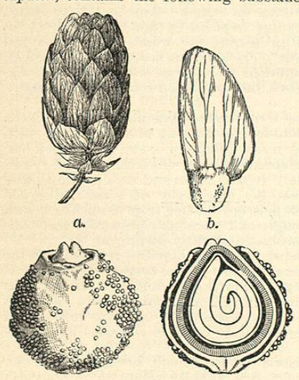

FIG. 2707.—Hop Plant. *a*, Cone; *b*, fructiferous bractlet; *c*, fruit enlarged; *d*, the same in longitudinal section.

ACTION AND USE.—Although used in many diseases with asserted benefit, but little can be said of hops more than that they are a mild bitter tonic and (especially lupulin) a feeble hypnotic and antispasmodic. In infusion they allay the pain and spasm of vesical catarrh, and improve the appetite and digestion. As an ingredient of beers they add a tonic, and perhaps diuretic, effect to that of the alcohol in those beverages. The dose is 1 to 4 gm. (gr. xv.–lx.). The Pharmacopœia provides, besides lupulin and its preparations, a twenty-per-cent. tincture, the dose of which is 4 to 8 c.c. (fl ʒ i.–ij.) and which is probably the best form of administration.

Henry H. Rusby.

HOREHOUND.—MARRUBIUM. "The dried leaves and tops of *Marrubium vulgare* L. (fam. *Labiatæ*)" (U.S. P.), but will probably be dropped from the next edition.

DESCRIPTION.—Leaves opposite, exstipulate, shortly and broadly petioled, the blades 2 to 4 cm. (1 to 1½ in.) long, roundish-ovate, truncate or subcordate at the base, obtuse, strongly rugose-veiny, more or less white-hairy, especially underneath; stems quadrangular, densely white-hairy; flowers in dense, axillary, white-wooly whorls; calyx tubular, five- to ten-nerved, with ten almost equal, erect-spreading, pungent teeth; corolla whitish, bilabiate; stamens didynamous; fruit of four ovoid, obtuse, smooth nutlets; aromatic and bitter.

A spurious marrubium is sometimes sold, having leaves of about half the size, thinner, less rugose and five of the calyx teeth much smaller or wanting.

Horehound is a European herb which has been introduced into this country, and in many places has escaped from old-fashioned country gardens to meadows and moist waste-places. Its woolly aspect and bitter odor and taste, combined with its characteristic labiate flowers and quadrangular stems, make it easily recognizable. It is also a native of Western Asia and Northern Africa.

The use of horehound dates from the ancient Romans, or even farther back. It has been a popular febrifuge and aromatic bitter tonic in many countries. The leaves and tops of the plant should be collected for use when it is in full bloom, and before the former have become old and dry; they are dried without heat, and should be preserved in dry boxes or drawers.

The most important constituent is the crystalline, neutral, bitter substance, *marrubiin*. There are, besides, a little *resin*, a little *essential oil*, *tannin*, and a considerable amount of alkaline and earthy salts.

Horehound was formerly prized as a febrifuge and antispasmodic, and used in numerous obscure diseases (hepatic, uterine, etc.), and in intermittent fever. It was also used for the only conditions for which it can be said to have any value, and for which it is still a little employed, viz., dyspepsia and debility. When a stomachic and bitter tonic is indicated, a tablespoonful or two (15 to 30 gm. = ʒ ss. ad ʒ i.) of an infusion, made in the usual way, strength one-tenth, is a tonic dose.

W. P. Bolles.

HORN'S SPRING.—Wilson County, Tennessee.

POST-OFFICE.—Lebanon. Hotel.

ACCESS.—Viâ Nashville, Chattanooga and St. Louis, or Nashville and Knoxville Railroad, to Lebanon, thirty miles northeast of Nashville; thence five miles west to springs. Conveyances meet all trains. The location of Horn's Springs is somewhat elevated and characterized during the summer months by refreshing breezes. A comfortable new hotel has recently been built, and is kept open all the year round. The springs are eight in number. According to an analysis made by Professors Safford and Summers, of Vanderbilt University, one of the springs contains the following chemical ingredients:

Calcium carbonate.	Sodium chloride.
Magnesium carbonate.	Phosphoric acid.
Iron carbonate.	Silicic acid.
Potassium carbonate.	Carbonic acid.
Sodium sulphate.	Sulphureted hydrogen.
Magnesium sulphate.	Organic matter (trace).
Calcium sulphate.	

This may be taken as a type of all the springs, which, as we are informed, contain much iron and have decidedly purgative effects, resembling to some extent the water of the Crab Orchard Springs of Kentucky. The waters of Horn's Springs have an extensive reputation in Tennessee, and the contents show that they may be useful in conditions of the system requiring an alkaline regimen, a ferruginous tonic, or a mildly stimulating cathartic.

James K. Crook.

HORSERADISH.—ARMORACIA. The root of *Roripa Armoracia* (L.) Hitchcock (*Cochlearia Armoracia* L., *Nasturtium Armoracia* Fries., fam. *Cruciferæ*). As a drug, the fresh root is always understood, and is official

FIG. 2708.—Horseradish Plant and Root.

in the British Pharmacopœia. The fresh leaves and herb are official in Germany and France. This well-known plant is a native of Eastern and Northern Europe, but it has been cultivated so long in other parts of the world that it occurs in a half wild state in many temperate countries. Its truly wild form is not known with certainty, and it does not readily perfect its seeds; but its roots are very tenacious of life, and make it, in localities favorable to its growth, difficult to eradicate.

Horseradish root is from 1 to 3 cm. or more (½ to 1½ in.) in diameter, and from 0.5 to 1 metre or more long; it is in cylindrical or slightly tapering pieces, with a large annulated and sometimes branched crown, generally broken in digging while still thick, 20 or 30 cm. from the top, but sometimes much longer and then dividing into three or four long, tapering branches, or else arising from a thick horizontal axis nearly or quite as large as the vertical one. Other pieces are of the smaller branches, or of the sucker-like horizontal portion. It is brownish-yellow outside and white within, rather too hard to be easily cut with a table-knife, but soft enough to be rapidly rasped or grated. When cut or grated, a pungent, peculiar odor is developed, which disappears upon drying or by heat; taste sharp and peppery, also disappearing with age and desiccation. Horseradish root and aconite root have more than once been stupidly confounded with each other, even with fatal result. They have no resemblance whatever excepting their pungent taste. (See *Aconite*.)

The deadly poke-root has also been fatally mistaken for horseradish.

COMPOSITION.—The root appears to contain *sinigrin* (*myronate of potassium*) and a ferment, *myrosin* (?), capable of forming with the sinigrin an oil identical with that of mustard, viz., sulphocyanide of allyl. The odor and taste of this oil are not developed until the root has been crushed or grated, or treated with water. By these means these substances, which are prevented from reacting upon each other in the whole or dry tissues, are brought together. If the root is extracted with alcohol, or if it is dried, no oil is obtained; but it can then even be produced by adding the ferment of white mustard and water. The composition is thus essentially that of black mustard. The leaves also contain a sulphureted oil said to be milder than, and not identical with, that of mustard.

ACTION AND USE.—Essentially that of mustard, to which the reader is referred. Locally it is rubefacient, and even vesicant; internally, an aromatic and stomachic; in concentrated form, an irritant. Its long-continued use as a condiment and flavor is justified by these properties. In former times it was used in scurvy, for which it is valuable, and for gout, rheumatism, asthma, etc., for which it is useless.

ADMINISTRATION.—Horseradish is rarely used as a medicine in this country, but if desired as an aromatic the British compound spirit offers it in an acceptable form:

"Horseradish root, scraped	20 ounces.
Bitter orange-peel	20 ounces.
Nutmeg	½ ounce.
Proof spirit	1 gallon.
Water	3 pints.

"Mix and distil a gallon. Dose, 1 to 2 fluidrachms."

W. P. Bolles.

HOSPITAL SHIPS OF THE UNITED STATES ARMY.—It was appreciated very early in the spring of 1898, by the Medical Department of the Army, in anticipation of the casualties to be expected in the war with Spain, that provision must be made for moving the sick and disabled at sea.

Of the many ships chartered or purchased for the transport service of the army none was considered suitable for hospital purposes.

On April 15th, 1898, the Surgeon-General of the Army applied for a ship to be used as a hospital ship. After many vessels had been inspected, cattle ships, transports, and others, he recommended the purchase of the *John Englis* as being a suitable vessel for the purpose in view. It was his intention to fit her up as a floating hospital for the care of disabled soldiers at any point on the Cuban coast, to transport them to our own coast, and to serve as a medical supply depot for troops in the field.

By direction of the President, after considerable delay, the vessel was purchased for this purpose, and was turned over to the Quartermaster Department of the Army to be altered and fitted up for the service required. Many changes were found necessary and it was not until July 2d, 1898, that she sailed from New York for Cuba, named the *Relief*. This vessel was built by Roach Bros., in 1896, was owned by the Maine Steamship Company, and was in passenger service from New York to Portland, Me. She is built of steel to her main deck, her superstructure being of wood. She is 306 feet in