

the present point of view this ventilation of the sewers is of questionable benefit. The volume of air rendered impure, and possibly dangerous, is proportioned to the thoroughness of the ventilation. Sulphureted gases may be diluted, and the outflowing air be free from disagreeable odors, but the very air movement which effects this may raise invisible clouds of fermentative and morbid agencies from the foul interior. Experiments on this point would be of value. Those mentioned above indicate that the communication with the outer air should only be such as is needful to relieve tension and prevent the forcing of seals, and that these air holes should be guarded by some filtering material. But since the volume of air which becomes contaminated is that which comes in contact with the fermenting material, it may be reduced as well by diminishing the extent of the impure surface as by cutting off the ventilation. Hence sewers of small size, as in what is known as the separate system, are to be preferred, on sanitary grounds, to the large ramifying tunnels of the combined system. The foul airs which arise from sewer apertures are matters of every-day observation. If well diluted with air they may not affect the sense of smell, but they rise, nevertheless, from the grated covers on our streets, and may be seen, by the vapor precipitated from them, as an uprising column in weather which clouds the air of respiration thrown out from the lungs. With open streets and lively breezes it is probable that these exhalations are dissipated, or rather diluted, to harmlessness, but in enclosed spaces and stagnant atmospheres the sewer air, which is so carefully excluded from living rooms by intelligent plumbing, may enter as fresh air through open windows and apertures specially devised for its admission.

Sewer air is atmospheric air with its oxygen diminished and its carbonic acid increased to from ten to fifty volumes per ten thousand, and with taints or notable amounts of marsh gas, hydrogen sulphide, ammonium sulphide, and amines or compound ammonias in which one or more atoms of hydrogen are replaced by a positive radicle, methyl, ethyl, amyl, etc. Cesspool air has an excess of these foul-smelling constituents, for the contents of a cesspool continue to putrefy, while the sewage in a well-constructed system of sewerage should be carried away before putrefaction sets in. Each of the impurities in sewer air is harmful when breathed in strength, but not specially dangerous when diluted with atmospheric air, for it is well known that men whose occupations bring them into contact with this contaminated air do not suffer specially from disease. But sewer air, like respired air, contains organic matter, and the propagation of certain infectious diseases, particularly typhoid fever, has been attributed to the presence of their causative agencies in the organic exhalations.

Dr. William Budd insisted on the harmlessness of human excreta unless infected by a previous case of typhoid fever, but Murchison taught the doctrine of pythogenesis or filth origin, irrespective of any previous case, and his doctrine prevailed for many years. Hence the slightest flaw in a system of sewage removal was accepted as an explanation in full of the presence of typhoid fever. The sanitary order of the day thereafter insisted on improved methods of sewage removal, and much good was thereby effected. Cleanliness and dry-earth systems benefited the country, and "plumbing regulations" gave city houses protection against sewer air, notwithstanding their intimate connection with the sewers. These hidden and too often uncared-for conduits were inspected, repaired, flushed, and ventilated until their air became purer than that of many city tenements. At this time no one seemed to observe that the evidence against sewer air as regards typhoid fever consisted only of assumption and assertion. When the sewers and house drains, the soil pipes and the traps were found to be perfect, the typhoid-fever element of sewer air was assumed to be so penetrating that coming up from the sewers it would saturate the water in a trap and be exhaled into a closet from the upper surface of the water; and if the closet was so situated that its air could communicate with that

of a living room or a bedroom, a case of typhoid fever was considered satisfactorily accounted for. Ultimately the propagation of the disease by a contaminated water supply and the discovery of the typhoid bacillus made the innocence of sewer air evident in many cases in which it had been tried hastily and condemned unjustly.

Sewer air is, however, always putrefactive and sometimes specifically infective. In the wide streets of a well-ventilated city, the bacteria in its sewer air, when diffused into the atmosphere at large through ventilators, are carried away, dried up, and deprived of their vitality before they have opportunity of doing harm; but as we may have vitiated air from the lungs in an unventilated room, so we may have vitiated air from the sewers in unventilated streets. The air of narrow streets in densely built localities where there is little air movement, as is often the case in summer, may become tainted with the putrefactions and infections of the sewers, and an epidemic constitution of the atmosphere may thus find an actual existence, manifesting itself by an unusual prevalence of diarrhoeal or specific diseases.

The air of dwellings is sometimes contaminated with ground or cellar air drawn up through a porous soil by the greater warmth of the living rooms. Ground air contains more carbon dioxide in summer than in winter on account of the influence of heat in promoting decomposition of organic matters in the soil. In general terms it contains in summer more and in winter less than one per cent. of this gas, or one hundred volumes in ten thousand of the air. It may also be contaminated by other products of decomposition, together with forms of bacterial life, for it remains to be proved that such particulate nitrogenous substances are removed by a filtration through the loose pores of the soil in which they are multiplying. Besides, in this question, evaporation from the surface is involved as well as filtration through the substance. The passage of air through and from the soil promotes evaporation from the surface, which may carry with it microscopic forms of life. Hence may be inferred the inadvisability of furnishing cellar air or air introduced by tunnels into a building for purposes of ventilation. This applies in particular to buildings erected on *made* ground. In fact, cellars, in default of an impermeable lining, should have a free circulation of air separate from the ventilation system of the superimposed building.

Charles Smart.

#### AIR EMBOLISM. See Embolism.

**AIR PASSAGES, FOREIGN BODIES IN.—NOSE.**—The presence of foreign bodies in the nose<sup>1</sup> is of common occurrence. The list<sup>2</sup> of them comprises extraneous substances introduced either through accident or design by infants or insane adults; sequestra of diseased bone; and parasites. They may also enter the nasal cavities from behind, during the act of vomiting or of choking, or in paralysis of the soft palate. Rarely, as in gunshot wound, they may pass through the walls of the nasal cavity from without. The history of those of the first variety is usually as follows: A child of about two, old enough to creep but not sufficiently intelligent to know better, thrusts some small, rounded object, such as a bean or a shoe-button, which it has found upon the floor, into its nostril. If the child be not caught in the act the body may escape immediate detection. Soon symptoms of chronic inflammation are established. These are confined to the nostril in which the body is, and continue until it is removed, the irritation often being severe and the discharge exceedingly fetid. The mucous membrane adjacent to the foreign body is in a condition of superficial erosion. The body, if too firmly impacted to be dislodged by simply blowing the nose, remains fixed, usually in the inferior meatus, until removed by the surgeon. Removal should be attempted by means of a hooked probe or fine forceps, the sensitiveness of the nasal cavity being borne in mind, and the removal of the body carefully accomplished after complete local anesthesia of the nasal cavity has been obtained, either by

cocaine or by the extract of suprarenal capsule. Copious hemorrhage, lasting two or three minutes, often follows, but is generally of little moment. The nostril should be washed several times a day with a weak disinfectant. In four or five days the membrane will often have healed so completely that no trace of trouble can be seen; the discharge ceases entirely, and the cure is complete. The possibility of the presence of a foreign body in all cases of fetid discharge confined to one nostril should always be remembered, and, the nostril having been cleansed with a warm douche, examination should be made with probe and speculum. If the object be lodged far backward, care should be taken in removing it not to allow it to fall into the larynx. Rhinoliths<sup>3</sup> are merely calculi formed by an accumulation of the earthy salts of the nasal secretions around some foreign body or inspissated mucus. Their presence has given rise to such irritation that they have been mistaken for cancer. Careful examination and the history of the case will easily establish the diagnosis. If the concretion be too large to be readily removed it should first be crushed. Foreign bodies of this nature are rarely met with, although one is reported which weighed seven hundred and twenty grains. Sequestra of bone, particularly in tertiary syphilis, sometimes remain in the nasal cavity after their separation, thus acting as foreign bodies. They must be thoroughly removed preliminary to further local treatment.

**Parasites.**—In tropical countries, seldom elsewhere, various kinds of flies, of the order *Muscidae*, may enter the nasal cavity, preferably of a patient suffering from catarrh, and there deposit eggs.<sup>4</sup> These are quickly hatched, causing in succession irritability, tickling, and sneezing; later, formication, bloody discharges, and epistaxis, with oedema of the face, eyelids, and palate; excruciating pain, generally frontal; insomnia, and if the condition be unrelieved, convulsions, coma, and death. Sometimes the larvæ are sneezed out, or may be seen on examination of the parts. This will, of course, establish the diagnosis. Destruction caused by the larvæ may extend to the mucous membrane, the cartilages, and even the bones of the head; the ethmoid, sphenoid, and palate bones having been found carious. Where the maggots have entered the frontal sinus or the antrum of Highmore, injections of tobacco or alum, or insufflations of calomel, formerly used, will be of little use. Chloroform or ether,<sup>5</sup> preferably the former, either inhaled or driven into the nasal recesses in the form of spray, is the sovereign remedy, as under it the larvæ are not killed, to remain *in situ* and thus cause further trouble, but escape with all haste to the outer air. Meanwhile, anodynes should be given to allay pain, and the patient's strength should be carefully sustained.

Such measures, however, are only serviceable when the case is seen early and the larvæ are still upon the surface of the mucous membrane. When they have attained their full development, they burrow into the soft tissues, whence it seems impossible to extract them except by seizing them bodily and dragging them out. If the desperate character of the situation in severe cases of this kind, and the impossibility of reaching the seat of irritation through the natural passages, are taken into consideration, no surgical procedure which promises relief can be thought too severe. It is therefore justifiable to open into the antrum or the frontal sinuses from without, to perform Rouge's operation, in order to gain access to the upper part of the nasal cavities or to open freely into the ethmoid cells. Several cases in which the patient's life has thus been saved have been related to the writer in recent years.

Lecches, ascarides, earwigs, and centipedes<sup>6</sup> have been found in the nose, causing insomnia, frontal pain, sanious discharge from the nose, lachrymation, vomiting, and, in some cases, great cerebral excitement. Sternutatories are generally sufficient for their expulsion.

**TONSILS.**—Three general varieties of foreign bodies may be found in the tonsil: (1) Foreign bodies proper, or substances which have become lodged in the tonsil during deglutition; (2) tonsillary concretions or calculi; (3)

parasites. The last two conditions are not common; the first will be described under Foreign Bodies in the Pharynx.

Tonsillary calculi are formed in the lacunæ of a chronically inflamed tonsil by a perverted condition of the natural secretions, and their retention in the recess through closure of its outlet. They vary in size, seldom attaining a greater diameter than three-fourths of an inch, and consist of phosphate and carbonate of lime, some iron, soda, and potassa, with varying proportions of mucus and water. Hence they are not necessarily of gouty origin.

The symptoms, generally not prominent, may be slight pricking of the throat with, occasionally, dysphagia. The presence of the calculus is sometimes directly irritating, and may give rise to quinsy, ulceration of the cavity, and abscess. Frequently, however, the symptoms are reflex in character. This is especially true with relation to the ear, in which organ the existence of a calculus may be associated with various forms of otic congestion and with tinnitus.

**Diagnosis.**, by ocular examination or by the use of the probe, is usually easy, and so also is the removal of the calculus by means of a forceps. Sometimes, however, the mass is so completely covered that it is only seen after careful exploration with the probe or even after the actual removal of the tonsil. In most cases the latter operation will afford the most certain cure. Very rarely, hydatids and trichoccephali have been found in the tonsil.

**PHARYNX.**—Foreign bodies are very often arrested in the pharynx, and the variety of these bodies is very great. Certain individuals seem especially liable to this accident, either from carelessness in eating, from insensibility of the parts, or from some unusual irregularity in the pharyngeal walls. Foreign bodies of large size generally lodge in the lower part of the cavity, where the cricoid and arytenoid cartilages project backward, or between the base of the tongue and the epiglottis. Small and sharp-pointed bodies may become fixed at any part of the pharynx, particularly in the tonsils, on account of their exposed position and the irregularity of their surface. They may also be entangled in the pillars of the velum, or in the lateral folds of the cavity. A large body may be found stretching across the whole width of the pharynx.

**Symptoms.**—These are local pain, dysphagia, and more or less inflammation, with occasionally ulceration or abscess of the pharynx; but generally there is simply localized inflammation and irritation. If an abscess be formed, the foreign body may escape through a fistulous opening in the neck, or it may perforate some important blood-vessel, or may even penetrate the intervertebral substance and cause caries of the vertebral bodies.

Inflammation of the pharynx may give rise to dyspnoea, while a large foreign body may cause suffocation by obstructing the entrance to the larynx.

The diagnosis can generally be established by the history of the case, and by inspection of the pharynx. Nervous patients often insist upon the presence of a foreign body in the throat, despite all assurances to the contrary, particularly if the pharynx be sensitive, or if at a certain point there is an inflamed lymph gland, or if, as often happens, a hard substance may have caused a slight laceration of the mucous membrane while being swallowed.

**Treatment.**—The patient's tongue should be well depressed, and the upper parts of the pharynx carefully examined in a strong light. If the foreign body does not then appear, search should be made for it, with the aid of the laryngoscope, in the region of the base of the tongue, the glosso-epiglottic sinuses, and the upper portion of the larynx. If present, it will generally be found without much difficulty, and should be removed by the finger or by a suitable forceps or probang. If dyspnoea be urgent, immediate surgical interference, of a nature suited to the special features of the case,—either tracheotomy, thyrotomy, or, possibly, some form

of subhyoid pharyngotomy, — may be required. The sensations of the patient are often unreliable, and the feeling of irritation caused by the presence of the body may continue for a long while after its removal. This is relieved by swallowing small lumps of ice, and later, if necessary, by the application of astringents and, in some cases, by galvanism.

**LARYNX.**—By reason of the danger to life which attends the lodgment of a foreign body in the larynx, this condition becomes one of the most important in surgery. The variety of objects found is infinite, and may be thus divided: Alimentary matters, introduced during mastication, in the act of laughing or talking, in deglutition, or in inspiration during vomiting; metallic bodies, such as coins, buttons, puff-darts, etc.; teeth, artificial or natural; necrosed bone<sup>8</sup> from neighboring regions, as from the nose in tertiary syphilis; and fragments of the laryngeal cartilages themselves, as thrown off in the late stages of syphilis, tuberculosis, and cancer of the larynx. Foreign bodies in the trachea may pass upward and become impacted in the larynx; and, rarely, they may gain access to the larynx directly from without, by forcible penetration of its walls, as in the case of bullets.<sup>9</sup> Again, the epiglottis may become incarcerated in the larynx,<sup>10</sup> or occlusion may take place from the so-called swallowing of the tongue.<sup>11</sup>

The symptoms vary with the size and position of the object. Thus a large body fixed in the rima glottidis may, unless dislodged, cause almost instant death. Again, small bodies lodged in out-of-the-way corners may remain indefinitely, causing nothing more than cough and discomfort. Dyspnoea may occur days after the entrance of a foreign body, from inflammation and tumefaction of the soft parts of the larynx, and danger from the presence of a foreign body may suddenly become imminent from alteration in the position of the body. Great peril sometimes arises from violent spasm of the glottis, due to irritation caused by the foreign body. Mental anxiety and localized pain are prominent symptoms in cases in which the accident does not immediately threaten life, but is followed by inflammation which rapidly becomes active.

A cautious prognosis must be given, even after removal of the body, as long as there are any symptoms of local inflammation. The diagnosis is established by the history of the case, verified or otherwise by laryngoscopic examination. The greatest difficulties arise with children too young to express themselves, in whom pain in the throat and symptoms resembling croup will often be the only indications obtainable. Here the use of the laryngoscope or direct inspection of the larynx as practised by Kirstein will be indispensable.

**Treatment.**—The offending body should, of course, be at once removed; if possible, through the natural passages and by means of the laryngeal forceps, aided by the laryngoscope, in case the symptoms are not urgent. Removal may be facilitated by placing the patient on his back upon a table, with the head hanging over the edge of the table, in which position the patient breathes more easily, and the law of gravitation becomes directly helpful. If asphyxia threaten, tracheotomy should be done at once, and the foreign body afterward extracted as described above. Bodies which at first are immovable may sometimes be loosened by reducing the local inflammation. In rare cases, when the object has become firmly impacted, thyrotomy may become necessary. A case is recorded in which a needle, transfixed in the larynx, was pushed through the anterior laryngeal wall, and thus removed.<sup>12</sup>

**TRACHEA AND BRONCHI.**—Any object which can pass through the rima glottidis may, of course, find its way into the trachea, in the same manner as was described in the paragraph relating to foreign bodies in the larynx. Sharp objects lodged in the œsophagus, and even diseased bronchial glands, may work their way through the walls of the trachea, and into its cavity. It sometimes happens, through carelessness or by accident, that parts of instruments used in intralaryngeal operations, tracheal cannulae,<sup>13</sup> laryngeal brushes, and even bits of solid ni-

trate of silver, drop into the trachea. If too large to enter either main bronchus, the body will probably remain at the bifurcation. Otherwise it will pass into one bronchus or the other, preferably the right, on account of its anatomical position, in the proportion of five to three, and thence travel indefinitely into one of the more remote bronchial divisions. Asphyxia may also be caused by the entrance of water into the trachea, as in drowning, or of blood during a surgical operation, of pus from the bursting of an abscess, of vomited matter, or of liquid food.

The symptoms will depend upon the nature of the body and its exact situation in the lung. Small objects have remained encapsulated with mucus for years without causing discomfort or serious results. Smooth, rounded bodies irritate less than irregular ones. Inflammation of the lungs from a foreign body may occur, and at the same time the presence of such a body may be entirely unknown. Large objects and fluids may cause death by instant suffocation, or death may result in the course of a few minutes, the symptoms presented being urgent dyspnoea, and cyanosis from asphyxia. The patient under these circumstances makes frantic efforts to obtain relief. He thrusts his fingers down his throat, he rushes to the window to get fresh air, and he makes strong inspiratory efforts; and if aid be not speedily afforded, death, with all the signs of asphyxia, soon follows. Severe dyspnoea, followed by relief without extrusion of the foreign body, indicates that the body has probably dropped from the larynx into the trachea. Dyspnoea is, of course, more urgent when the trachea is occluded than when the foreign body stops only one bronchus. The body may change its position, passing from one bronchus to that of the opposite side. A body, small when swallowed, may become more dangerous through increase in size, either by imbibition of water or by forming the nucleus of a concretion. Physical signs due to the presence of a foreign body in the lung may be altogether wanting, but they are generally more or less distinct. They are the following: whistling or flapping sounds at the point of lodgment, decreased fremitus, and absence of respiratory murmur in the lung beyond. The diagnosis is often very difficult. At or about the bifurcation the body may be seen with the laryngoscope. The lodgment of a foreign body in the lung may result in pneumonia, tuberculosis, abscess, or gangrene. Or it may become encapsulated and do no apparent harm. Rarely a body, generally an ear of barley or other grain, having formed an abscess of the lung, has been discharged through the wall of the thorax, with complete recovery.<sup>14</sup>

**Diagnosis.**—The fact that some foreign body has been inhaled should be established if possible, and the site of the body determined. In children and incompetents, and in cases in which the dyspnoea is urgent, this may not be easy. While the laryngoscope may fail to reveal the presence of the foreign body in the trachea, it can at least furnish satisfactory evidence that the object in question is not located in the larynx.

The prognosis is serious; it depends upon the nature of the foreign body, the amount of dyspnoea, and the organic lesions which may result. The danger is greatest at the first, and although it diminishes in varying degree as time passes, it is never entirely absent. Even after expulsion of the foreign body death may occur from the organic disease set up. The expulsion of one object does not, especially with children, preclude the possibility of others remaining in the lung.

**Treatment.**—The treatment of foreign bodies in the trachea must be determined by the circumstances of the case and by the nature of the foreign body. When the trachea and bronchi are filled with fluid the patient should be placed upon his back, the head and shoulders as low as possible, the mouth should be forced open, the tongue drawn far forward, and the walls of the chest compressed. Artificial respiration should be instituted the moment the trachea is sufficiently free to allow of the ingress of air.

The treatment of solid bodies which have gained access to the trachea or bronchi is one of the most difficult things in surgery. In brief, if the object be small in size, regular in contour, and of smooth surface, it appears that better results have been obtained by waiting for spontaneous expulsion than through operation. When the foreign body is rough, irregular, or very large, a low tracheotomy will generally give the best opportunity for its removal. If, as sometimes happens, the foreign body cannot be reached at the time of the operation, the wound in the trachea may be kept widely open in the hope that this body may be extruded on some future occasion.

The conditions demanding speedy operation are: 1. Urgent and dangerous symptoms, as progressive dyspnoea, or frequently occurring attacks of dyspnoea, or laryngeal spasm, when laryngoscopic examination fails to reveal the object or shows that its speedy removal by the natural passages is impossible. 2. When a sharp and irregular body is impacted, as shown by the laryngoscope, in such a way that immediate extraction is impossible, and when acute inflammation, and especially œdema, are rapidly developing, as evinced by increasing dyspnoea. 3. In the case of a foreign body of any nature which lies loosely in the trachea, and the movements of which excite laryngeal spasm or coughing of dangerous violence. 4. In the case of a foreign body which is impacted in either of the primary bronchi, as ascertained by the rational and physical signs, particularly by auscultation. In this latter condition low tracheotomy and immediate direct attempts at extraction are often successful. Direct examination of the site, and demonstration of the foreign body in or at the mouth of a bronchus, by means of the finger introduced quickly into the trachea, are possible, and this knowledge renders the subsequent instrumental removal of the body more easy. The entrance of a foreign body into a bronchus to such a distance as to place it beyond reach through the natural passages, is an accident of the gravest danger. A number of cases have occurred of late years in which surgical operation has been attempted by entering the bronchus through the chest wall from without. All have proved fatal. 5. Sharp-pointed, hard, and irregular bodies within the air passages will, as a rule, demand bronchotomy, provided they are not so located that they may be reached and removed by the natural passages at an early moment. The plan of treatment by inversion of the patient has of late years fallen into disrepute, and should seldom be practised, unless tracheotomy can be done at once if required. In employing it, it should be remembered that the supine position will favor exit of the body, particularly if the glottis be in the condition of deep inspiration. In all cases the diagnostic importance of a thorough laryngoscopic examination cannot be too strongly insisted upon, nor the great utility of the laryngoscope be overestimated.

D. Bryson Delavan.

- <sup>1</sup> Tillaux: Soc. de Chirurg., January 26, 1876; also Bron: Gazette Méd. de Lyon, 1867, No. 26.  
<sup>2</sup> Morell Mackenzie: Diseases of Throat and Nose, London, 1880.  
<sup>3</sup> Schmiegelow: Trans. Eighth Inter. Med. Cong., 1884.  
<sup>4</sup> Buchanan: Phila. Med. Times, October 30, 1875.  
<sup>5</sup> John Ellis Blake: Boston Med. and Surg. Journal, April 10, 1862. To Dr. Blake belongs the credit of having first discovered and reported this method of expelling larvae from remote sinuses.  
<sup>6</sup> Packard: Phila. Med. and Surg. Reporter, August 3, 1878.  
<sup>7</sup> Bruce: London Lancet, February 18, 1883.  
<sup>8</sup> Lincoln: Archives of Laryngology, vol. III, p. 276.  
<sup>9</sup> Daly: Gunshot Wounds of the Larynx. Trans. American Laryngological Association, vol. VI, p. 47.  
<sup>10</sup> Cohen: Phil. Med. and Surg. Reporter, March 16, 1878.  
<sup>11</sup> Ingals: Trans. Amer. Laryngolog. Assn., vol. II, p. 135.  
<sup>12</sup> Field: New York Medical Record, March 10, 1877.  
<sup>13</sup> Cohen: Diseases of the Throat, New York, 1873.  
<sup>14</sup> Howell White: New York Medical Record, September 10, 1881.

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**AIX-LES-BAINS.**—This is a town of about 5,000 inhabitants, picturesquely situated in a beautiful valley on the east shore of the Lake of Bourget, and surrounded by high mountains (the Savoy Alps). It is about twenty hours from London via Paris and Macon, eight hours from Turin, four from Lyons, and three from Geneva. Its elevation above the sea level is 850 feet, and 100 feet above Lake Bourget.

The climate is soft and mild, the average temperature being 55° F. during the year, and the mean summer temperature 70° F. June and September are delightful months. "Owing to its excellent atmosphere," says Linn, "people rest well here."

The thermal sulphurous waters, known to the Romans, for which about 35,000 people visit the town annually, are derived from two copious springs which have a temperature of from 107° to 112° F., and which are called "St. Paul's" and the "Alum." They yield about one million gallons of water daily. They are nearly devoid of solid constituents and contain sufficient sulphureted hydrogen to give them the characteristic odor. "The waters of the two springs are chiefly used for baths, but the 'Alum,' spring is likewise used for drinking. For internal use, however, the stronger cold water of Challes, near Chambéry, and of Marlioz are chiefly employed.

"The waters and the various methods of treatment employed at Aix are of service in cases in which indifferent thermal waters are of use"; the methods of treatment are probably the most efficacious in producing the results. "The diseases which receive especial benefit from the Aix treatment are chronic gouty and rheumatic affections, muscular rheumatism, sciatica, neuralgia, neurasthenic conditions in arthritic subjects, chronic cutaneous eruptions, and chronic catarrhal affections of the mucous membranes." "In rheumatic arthritis," says A. B. Garrod, "the value of the Aix course far exceeds, according to my experience, that of any other known spa." Excellent results are also obtained in the stiffness of joints arising from former injuries and from gouty and rheumatic affections.

The large bathing establishment is the property of the state, and is one of the most efficient of these institutions known. There are swimming baths (*piscines*), fifty douche rooms with conveniences for administering massage; six vapor rooms (*bouillons*); five hot dry-air rooms (*étuves*); two general vapor baths (*caisses*); and four apparatuses (Berthollet's) for applying vapor locally.

There is a special *piscina* for the treatment of chronic skin affections by prolonged baths, after the method of Lœche-les-Bains. Poor people are cared for as well as the rich. The especial feature at Aix, for which it is so famous, is the "douche massage," consisting of the methodical application, by two skilled attendants, of massage combined with douches. This procedure, which may be used for the whole body or especially applied to the desired part, is to be carried out in the following manner: The patient is seated upon a wooden stool, and two attendants, male or female as the case may be, pour the water upon the body from a hose, while at the same time they shampoo, knead, and rub according to the directions given by the physician, who accompanies the patient to the douche the first time, to give instructions as to temperature, force, duration, and pressure on particular parts. The masseurs have each a hose under their arms from which they direct the water over the bather. The "douche massage" may be combined with passive movements of special joints, to be followed

or preceded by a vapor bath in the adjoining *bouillon*. In many cases patients, after walking to the bathing establishment, send back to their hotel their clothes, and, at the close of the bath (which lasts about ten or fifteen minutes), they are rubbed dry, wrapped in a blanket, and carried in bath chairs by porters back to their hotel and put to bed (see Fig. 68). "The men and women who perform the douche massage have had their art handed down to them for many years, as their fathers and mothers were masseurs and masseuses before them." The Aix waters have an unctuous quality which makes them particularly adapted to rubbing and kneading the



FIG. 68.—Method of Conveying Patients to and from the Thermal Establishment at Aix-les-Bains. (The patients are wrapped in blankets only.)

muscular structures, a quality that is not found in other waters. While using the waters the patient's diet is carefully regulated by the physician.

Some two thousand douches and one thousand baths are often given daily during the season.

The sanitation of Aix is excellent and the accommodations are ample and satisfactory. The season extends from April to November, though the baths are open the entire year. July and August are the most frequented months. In this country the Hot Springs of Virginia, and the springs of Richfield and Sharon in New York State, correspond to the waters of Aix as to the class of diseases treated, and the bathing establishments at these places are modelled after those of the European spas.

For much of the above description of Aix-les-Bains the writer is indebted to Weber's "Spas and Mineral Waters of Europe," 1896; to Linn's "Health Resorts of Europe"; and to the articles in the previous edition of the HANDBOOK.

Edward O. Otis.

**AJACCIO.**—The principal town of the island of Corsica, with a population of 20,000. It is situated in the centre of a beautiful and well-protected bay opening to the southwest. "Fifteen to twenty miles in the rear of Ajaccio is a semicircular mountain chain of granitic formation sloping down to undulating foothills, and presenting a glowing panorama at sundown. During

the winter season the distant peaks of Monte Cinto, Rotondo, and d'Oro are capped with snow, and the chilly northeast wind over the gulf of Genoa is dried and broken in force before it reaches the western shore, where it is again arrested near Ajaccio by the sheltering hills surrounding the town" (A. Tucker Wise: Transactions of the American Climatological Association, 1890). The visitors' quarter is along the Course Grandival in the northwestern portion of the town, "which is the section most protected and best sheltered from the winds." "The soil at Ajaccio is disintegrated granite, and allows a rapid disappearance of the heavy showers which fall

during the autumn. But, unlike the Riviera, this locality has only a small rainfall in March."

The water supply is of a pure quality, and is brought to the town from Carazzi, twelve miles distant. "The drainage of Ajaccio is certainly not perfect," says Wise, "but zymotic diseases are very uncommon." "The town itself," continues the same authority, "is one of the dirtiest, and its only title now (1890) to the fame of a health resort lies in the climate solely." "Invalids, however," he sententiously adds, "cannot live on climate alone."

The vegetation is most luxuriant, and all the principal streets are bordered with avenues of acacia, orange, or citron trees. Bananas, oranges, lemons, a variety of cacti, the castor-oil plant, prickly pear, aloe, fig, and olive flourish.

"I, at any rate," writes D. W. Freshfield in the *Alpine Club Journal*, quoted by Ball, "know of no such combination of sea and mountains, of the sylvan beauty of the North with the rich colors of the South; no region where within so small a space Nature takes so many sublime and exquisite aspects as she does in Corsica. Orange groves, olives, vines and chestnuts, the most picturesque beach forests, the noblest pine woods in Europe, granite peaks, snows, and frozen lakes—all these are brought into the compass of a day's journey."

The accommodations now appear to be ample and satisfactory, both from the standpoint of health and from

that of convenience, whether one desires hotel, pension, or villa.

As to the meteorology of Ajaccio, the mean temperature during the winter is about 55° F. with a small daily variation of not more than 10° F.; this is two or three degrees higher than the mean temperature of the Riviera.

"During the season (November to April) the thermometer rarely rises above 59°, or falls below 50°" (Ball). The relative humidity is given by Wise as 80 per cent., and by another authority as varying between 70 and 78 per cent. The average number of rainy days for the season is stated by Wise to be 30, and by the writer on Ajaccio in Eulenburg's "Real-Encyclopädie," for the months from October to April inclusive, 40 to 45. During the three rainy months, December, January, and February, the average number is not more than 14, according to Ball. The prevailing wind is the southwest, which is "a temperate and soft wind, with genial bright weather, and prevails as a high current throughout the greater part of the winter, and in spring its continuance for a prolonged period is almost a certainty" (Wise). The southeast wind ("sirocco") is a very depressing one, producing loss of appetite and sleeplessness. "From my own personal point of view," says Wise, "I regard Ajaccio as the most comfortable climate I have ever visited, with the exception of the winters in the Bermudas, and, in comparison with Madeira, it is certainly more bracing and agreeable to the able-bodied." The climate can be characterized as a moderately moist, mild, marine climate, with a comparatively large number of sunny days, ranking between Madeira and the Italian Riviera, but warmer and more equable than the latter. On account of the hard granite soil there is no dust, and winds are infrequent.

"It has always been a matter of surprise to me," says Williams ("Aero-Therapeutics," 1894), "that Ajaccio has not been more utilized as an alternative climate by the Riviera medical men, when their own has proved too stimulating or too marked by radiation extremes, for this mild, moist atmosphere, with its freedom from all but sea breezes, and its good hotels and quiet surroundings, seems to supply the requisite and beneficial change."

The phthisical patients for whom this climate is especially well adapted are those who can afford but little physical effort in order to exist—cases of "phthisis of advanced life, with cardiac feebleness, where the powers of resistance to cold are at a low ebb, or there is much emphysema with cold, livid extremities" (Wise). It is also beneficial for those in whom "the breathing powers are greatly diminished or when a stubborn cough is a prominent symptom." Certain cases of incipient phthisis which are unsuited to the altitude treatment do well in Ajaccio; and the same remark applies to those affected with nervous irritability who require a soothing climate.

Ajaccio is reached by steamer from Nice and from Marseilles in twelve and a half and eighteen hours, respectively.

Edward O. Otis.

**AJOWAN.**—(*Ajava*; *Bishop's Weed*.) The fruit of *Ptychotis Coptica*, D. C. (fam. *Umbelliferae*).

This plant is supposed to be indigenous to India, where it has always supplied an important cultivated crop. The fruit—one of the cremocarps commonly called "seeds"—is prized for table use, as well as for its medicinal properties. It is employed in all cases requiring a carminative, and its action is powerful. It has also been much used in cholera, combined with camphor, on account of its powerful stimulation of the abdominal nerves, and for its antiseptic effect. These uses are fully explained when it is known that the plant contains four per cent. of a volatile oil rich in *thymol*, and that it is largely used as a source of that substance. Its properties and uses are therefore those of that drug. The dose is 1 to 2 gm. (gr. xv.—xxx.).

H. H. Rusby.

**AKINESIA.** See *Paralysis*.

**AKINESIA ALGERA.**—(*ἀκίνησις*, without motion; *ἀλγος*, pain.) Moebius<sup>1</sup> has given this name to an array of symptoms, among which the most characteristic is loss of power of movement as the result of accompanying pain, while no sufficient cause for the latter symptom has yet been found.

The cases which he reports were persons of neurotic inheritance, so-called *déséquilibrés*, in whom the disease manifested itself after mental overexertion. In the one case neurasthenia, in the other hysteria, was present. In both cases the disease was quite protracted. The first case reported by him occurred in a man, a teacher in the gymnasium, thirty-three years old. The father suffered from paranoia. The patient during his youth was very excitable and extremely ambitious. There was no history of sexual perversion. In 1887 he suffered from headache and insomnia. In the spring of 1888 he was unable to carry on his work, and was sent to an institute. Subsequently to this there occurred a loss of memory for three or four weeks. After every movement the patient experienced a heaviness of the limbs and pains in the muscles. Improvement took place under prolonged rest, or the Weir Mitchell treatment. Following this a relapse occurred, during which the patient abstained from all movement of the limbs. The skin and tendon reflexes were present, the patellar reflex was quite marked. On the right side the ankle reflex was weak; on the left it was marked. There was found hyperesthesia in the hands and forearms; no points of pain, however, were discovered. Organs of special sense were normal. Every voluntary movement of the limbs and trunk was accompanied by severe pain, lasting for hours. These pains were most marked in the forearms. The head was free from pain, and there was no difficulty in moving it. There was a very slight muscular atrophy of the left hand, which was possibly caused by the pressure of paste-board splints.

In the way of treatment, bromide of potassium, given in the evening in doses of from three to four grains, produced rest. Hypnotic suggestion was without result. Improvement followed after several months' rest. The tendon reflexes became weaker and finally normal, there remaining a weak ankle clonus on the left side. Subsequently to this, and following a considerable excitement, a relapse occurred, with subsequent improvement. The hands, however, remained quite painful.

The second case occurred in a woman, forty-three years of age, by occupation a teacher of music. A neurotic family history was given. From her twentieth year onward the patient had suffered from tremors, with semi-unconsciousness. The hands were painful, and were held in a flexed position. She also suffered from insomnia, and was incapable of mental work. The feet were painful, and walking was impossible. After suffering in this way for ten years improvement set in, and the patient was comparatively well for a subsequent period of ten years. In the summer of 1889, probably as the result of overwork and excitement, a relapse occurred, from which she had not recovered up to the time of the report. There were found extreme irritability, a forced position of the hands, and pain in the legs. The latter could be moved, but they soon became tired, and suffered from quite severe after-pains. Auditory and visual functions were normal. Hypnotic treatment was without result. The patient twice attempted suicide, and finally gave evidence of mental trouble, with hallucinations of persecution. She subsequently died in an insane asylum.

In a subsequent publication<sup>2</sup> Moebius reports another case in which, in addition to the absence of motion resulting from pain, and really superseding it in importance, there was present an extreme degree of photophobia. We have here a condition very similar to that which has occurred in regard to motion, a condition in which the patient will not see because of the attending pain.