nature and its unlimited duration and obstinate recurrence. It is perhaps caused by irritation of the recurrent laryngeal nerve, but more probably by pressure on the trachea especially at its bifurcation, a point of very sensitive reflex. Dyspnœa may be so extreme as to suggest involvement of the vagus. Dysphagia is apt to be slight and is often considered hysterical, especially as nothing is revealed by examination with the sound. It may disappear after rupture or contraction of the glands.

Compression of the large vessels is shown by the frequent nose-bleeds, by the prominence of the vessels of the face, neck, and thorax, by clubbed fingers, and rarely by œdema. Sputum is often not present at all; when present it may be purely catarrhal or œdematous with streaks of blood. Michael saw a fatal hemorrhage which proved to have come from the rupture of a caseous gland into a blood-vessel and a bronchus simultaneously. The voice is apt to be weak or hoarse, and in extreme cases there is complete aphonia from pressure on the recurrent laryngeal nerves. Vomiting is probably due to pressure on the vagi.

Inspection reveals signs of venous stasis in the prominent veins of the thorax and neck, possibly even of the face; rarely a fulness or a diminished expansion of one side. Palpation reveals enlarged cervical glands, especially those which can be felt on deep pressure in the suprasternal notch, when the head is bent forward; also a certain rigidity of the trachea in inspiration and expiration or perhaps a one-sided displacement of the trachea. Vocal fremitus may be increased over certain areas of the chest. No changes may be detected on percussion, but in a minority of cases a diminished resonance may be detected between the shoulder blades extending from the second to the sixth dorsal vertebra, usually more marked on the right side as the glands on this side are larger and more numerous than on the left. Occasionally this diminished resonance is found over the same area anteriorly. Arnoux considers dulness under the right sterno-clavicular articulation an important sign. On auscultation over the interscapular space a rough blowing respiratory sound, with much prolonged expiration, may be detected. There may be a decided difference in the sounds on the two sides.

The diagnosis of bronchial-gland tuberculosis is not difficult in children, in whom such an affection is quite common, but its rarity among adults makes mistakes in diagnosis more frequent here. Symptoms of œsophageal narrowing in tuberculous adults with palpable cervical glands would make such a diagnosis probable; but one would be obliged to rule out mediastinal tumors, syphilis, and lung carcinoma or sarcoma.

The treatment, to be successful, must as a usual thing include a complete change of surroundings, and prolonged residence in the open air in a favorable climate. Probably the choice of a favorable climate resolves itself into one in which out-of-door life is possible, whether this is on the seashore or in the mountains. Bathing, gentle massage, inunctions with oleaginous media, as lanolin, or even cod-liver oil, cold compresses at night, and tepid sponging in the morning, are recommended as general treatment. Internally, cod-liver oil still holds its place as the remedy par excellence in such cases, although arsenic, the phosphates, hypophosphites, and glycerin have been recommended.

Tumors of the lymph glands lead us to the consideration of mediastinal tumors in general.

Tumors.—The structures in the mediastinum which may be starting-places for new growths are the thymus gland, the thyroid gland with its occasional accessory thyroids, the lymph glands, and the connective tissue. Such tumors as originate in the viscera or serous membranes in this region are, strictly speaking, not included among mediastinal tumors, although in the later stages of their development they may come to lie in the mediastinum, and it may be impossible to determine their true origin.

Benign growths of the mediastinum are not common. Lipomata growing from the subpleural fat have been reported (Hare, Krönlein, Gussenbaum). Large fibromata, usually under the sternum and compressing the trachea, have been found in five instances (see Hare's article on "Affections of the Mediastinum," Phila., 1889.

The most interesting as well as the most numerous, to judge from the reported cases, are the dermoid cysts, the earliest report of which was made in 1827. Christian has collected forty cases since that date. These tumors are usually soft, fluctuating, sometimes pulsating, either from their own rich vascular supply, or, what is more probable, from transmitted aortic pulsations. They are apt to lie under the clavicle on one side or on both sides of the sternum, and are almost invariably diagnosed at first as aortic aneurism. The contents of the cysts are sebum, atheromatous débris, hair, squamous epithelium, sometimes teeth, fat, cartilage, and bone. Waldeyer describes one which was as large as a child's head, and pedunculated, its pedicle consisting of veins, arteries, and thyroid tissue. Marchand's cyst contained fat, and bodies resembling Hassall's corpuscles. Three of the forty cases of Christian showed evidences of malignancy. These tumors are usually benign in character, but from their situation necessarily dangerous, as rupture may take place into the pericardial sac, into the pleural cavity, into the left lung, into a bronchus, causing aspiration pneumonia, or into the aorta with fatal hemorrhage. On the other hand, dermoid cysts of the mediastinum are operable and their removal is a perfectly justifiable surgical procedure. The importance of diagnosis between these benign tumors on the one hand and malignant tumors or aneurism on the other becomes therefore very great.

The points to be emphasized in such a diagnosis are: the slow growth of the tumor and the absence of cachexia, which rule out malignant growths and metastases; the fact that characteristic symptoms of aneurism are either absent or when found are not proportioned to the duration of the disease, nor do they progressively increase, as would be expected in aneurism. In some cases (20 per cent. of all, according to Christian) the diagnosis has been made from the presence of hair in the sputum.

Simple cysts have been found in the mediastinum, and Marfan has collected four cases of echinococcus cysts.

Another form of benign tumor of the mediastinum has its origin in the thyroid gland proper or in an accessory thyroid. Wuhrmann finds in the literature ninety-one such tumors, seventy-five of them benign, sixteen malignant. The thyroid is occasionally situated much more deeply than usual, lying behind the sternum with its lobes between the trachea and the œsophagus, while accessory thyroids may be found anywhere within the space bounded above by the base of the tongue, below by the arch of the aorta, laterally by the large vessels of the neck, and posteriorly by the spinal column. It is therefore possible to find adenomata, carcinomata, or sarcomata of thyroid origin behind the clavicles, or behind the sternum, compressing the trachea or still deeper. Osler found an adenoma in the pleura. They may be quite isolated or connected with one or both lobes of the gland, or attached to it by a cord-like pedicle. Dittrich reported a substernal "endothoracic struma" the size of a man's head, which had compressed all of the right lung.

As in the case of dermoid cysts the diagnosis is at once difficult and extremely important, for the great majority of these thyroid tumors are benign and operable. Braun removed one from a woman fifty-eight years old. Those cases in which the tumor is palpable, and especially those in which a cord can be felt running to the region of the thyroid, or in which absence of one or both lobes of the gland can be made out, are not so difficult to recognize, but some of the deeper-seated ones are not palpable at all. Birch-Hirschfeld found such a one at an autopsy on a woman who was supposed to have suffered from a severe cardiac neurosis.

The most important and by far the most numerous tumors of the mediastinum are those which arise in the lymphatic glands. Of these some are described as benign and are designated lymphoma or lymphadenoma: others are malignant and are variously named lympho-sarcoma, malignant lymphoma, round-celled sarcoma, fibro-sarcoma, alveolar sarcoma. The confusion which exists in our text-books on the subject of lymphatic tumors, general and localized, cannot be cleared up at this time, for our knowledge of the relation of such tumors to diseases of the blood-building organs is as yet too vague, and it is impossible to draw a sharp line between the so-called hyperplasias with and without blood changes, and the neoplasms proper. Perhaps the simplest classification which can be made is that which places under one head the general hyperplasia of lymphatic glands, liver and spleen (leukæmic and pseudoleukæmic enlargement), and under the other the localized enlargements, or tumors, dividing them further into benign and malignant. Under the head of benign tumors of the lymph glands we have the lymphoma or lymphadenoma, a localized, benign enlargement of one or more lymphatic glands, distinguished on the one hand from lymphosarcoma by its non-malignancy, on the other from leukæmic and pseudoleukæmic lymphomata by its circumscribed character, and the absence of leukæmia or anæmia and of characteristic enlargement of spleen and liver.

The malignant lymphatic tumors have been variously designated as lymphosarcoma, malignant lymphoma, round-celled sarcoma, fibro-sarcoma, alveolar sarcoma. Ohlmacher is inclined to make no distinction between the different sarcomata which arise in lymphatic tissue. On the other hand, Kundrat thinks there is an essential difference between lympho-sarcoma and other forms of sarcoma. According to him lympho-sarcoma has a characteristic mode of increase and invasion. It is enormously infiltrating and insinuates itself into the spaces between organs and vessels, gradually fusing them into one mass but not causing rupture as do most malignant growths. It spreads not only by infiltrating the surrounding structures but by involving the other lymph glands, and instead of forming nodular metastases in the parenchymatous organs it forms its metastases by preference in the solitary follicles of the intestinal tract. Fibro-sarcoma may have the same situation as lympho-sarcoma, but is not so infiltrating, does not attain such an enormous size, and forms metastases in the usual places.

We may, therefore, consider that the primary tumors arising from the mediastinal lymph glands are lymphoma, lympho-sarcoma, and perhaps fibro-sarcoma, or round- or spindle-celled sarcoma, although these last might be regarded as arising, not in the lymph glands, but in the ordinary connective tissue. The same would be true of the rare cases of endothelioma and alveolar sarcoma. Primary carcinoma of the lymph glands, often spoken of in the older literature, is now regarded as a misnomer.

The lymphatic tumors of the mediastinum are usually soft, creamy tumors with thin-walled vessels, growing rather rapidly, but on the whole not so rapidly as do the majority of malignant tumors, or as do the lymphatic tumors of leukæmia; and sometimes they are of very slow growth. The cells break through the capsule of the gland and infiltrate the surrounding tissues, gradually fusing them into a large mass, from which crab-like prolongations resembling carcinoma can be seen extending still farther. Colossal tumors are formed, larger than those formed by any other variety of sarcoma, and involving all of the structures in the mediastinum. Kundrat reports a large tumor in a woman of sixty, which had so completely filled the left lung as to occlude the bronchus and reduce the lung to islands of collapsed pigmented tissue. Such a tumor has been known to involve the sternum and the vertebral column, reaching the meninges through the intervertebral foramina. Rupture of vessels is rare, compression with thrombosis is the more usual result (Kundrat). The tumor is rare in childhood, appears between the twenty-fifth and fifty-fifth years, is twice as frequent in men as in women, and seems to attack the strong and well-developed by preference. It is singular that very few show signs of previous tuberculosis of the lungs or of the remaining lymph glands. Metastases, as already stated, are found in the intestinal tract, more rarely in the liver, spleen, and kidney, where they tend to be very infiltrating, but are not accompanied by the general enlargement of the organs in question which occurs in leukæmia and pseudoleukæmia.

The histology of these tumors is very simple, and we cannot, on the grounds of microscopical structure, draw any line between the many varieties which have been distinguished macroscopically and clinically. They all consist of small round cells, held together by a varying amount of reticular connective tissue, and enclosed in a capsule which cannot be stripped off without tearing off some of the tissue. Giant cells and spindle cells are not often seen. Cysts may form, thus rendering the tumor very soft, or there may be enough fibrous reticulum to make it hard.

Secondary tumors of the mediastinum appear in the lymph glands almost exclusively, and may be either epithelial or sarcomatous; the former are secondary to carcinoma of the mammary gland, of the lungs, and very seldom of the gall bladder, kidney, or stomach. It is remarkable that the bronchial glands proper often escape in cancer of the œsophagus, and sometimes in carcinoma of the lung, although in other cases these may be the only glands involved, as in a case of Powell's in which a carcinoma of the head of the pancreas formed metastases in the bronchial glands alone. Secondary sarcoma is not so common, but it has been found following sarcoma of bones of the upper extremities.

The symptoms are those which are common to all malignant tumors and those which are caused by pressure upon the contents of the mediastinum. Subjective sensations are at the earliest stages limited to a feeling of pressure and fulness usually referred to the neck, and palpitation of the heart, but no pain. Intercostal neuralgia is not at all typical. The temperature varies; there may be irregular fever for many months, though it is difficult to understand what should cause it in an uncomplicated case. The position assumed by the patient is not characteristic, being now with the head thrown back, now with the head bent forward; again, it may be kneeling with the head on the crossed arms. As these positions are assumed to relieve the dyspnœa, they are assumed only in the later stages when the tumor has attained such dimensions as to cause pressure. This dyspnœa is variously explained as being caused by pressure on the trachea, bronchi, and recurrent laryngeal nerves, and on the veins of heart or lungs. It may be impossible to decide just which is involved in a given case, yet there are certain signs which aid in the diagnosis. Pressure on the veins would cause cyanosis, on the heart would alter the pulse rate and strength, and on the recurrent laryngeal nerves would cause laming and partial closure of the glottis. Characteristically the dyspnœa of mediastinal tumors is of long duration and unintermittent; but in some cases, as a result of raising of the blood pressure in a very vascular tumor, or from accumulation of the secretion in the narrowed trachea, it develops suddenly and is fatal. Irritation of the vagus is probably responsible for the cough, vomiting, palpitation, regurgitation of food, and girdle sensation observed in some cases; irritation of the sympathetic for the dilatation of the pupil on the affected side. In a case of Demmé's there was complete destruction of this nerve with contraction of the pupil. Irritation of the phrenic nerve (very rare) causes severe neuralgia and singultus, but strangely enough no dyspnœa. Pressure on the aorta causes a difference in the radial or carotid pulses of the two sides. Compression of the œsophagus is quite common.

Inspection.—Enlarged veins anteriorly or posteriorly; œdema of the neck and shoulder, or arm, or over the sternum; but this œdema is apt to appear early in the disease and then disappear even when the venous stasis persists. There is sometimes a fulness visible on the affected side; pulsation has been observed transmitted from heart or aorta or from the vascularity of the tumor itself, as in Letulle's right-sided tumor, which he describes

as resembling a "second heart on the right side." Sometimes the growth may be felt in the suprasternal notch.

Percussion.—Dulness according to size and position, usually behind in the interscapular space, or in front on both sides of the sternum, but always with characteristically irregular outlines. Letulle thinks there is sometimes a tympanitic resonance over posterior mediastinal tumors which push forward the lung. The heart dulness may be displaced.

Auscultation shows the same signs as in tuberculosis of the glands, and is valuable not only in revealing pressure on the bronchi and lungs, but also negatively in helping to make the diagnosis between mediastinal tumors and aneurism, although in some cases pressure on the aorta may give rise to a systolic sound very like the aneurismal bruit.

Other conditions which must be thought of in diagnosing these tumors are: syphilis with enlargement of the glands and ulceration and cicatrization of the trachea (Lazarus); malignant tumors of the lung and pleura, which, however, do not attain the enormous size of mediastinal tumors, cause metastases in the parenchymatous organs, and do not cause such marked symptoms of venous stasis; phthisis, in which case the sputum would be diagnostic; tuberculosis of the glands, which in adults is usually attended with tuberculosis in some other organs, and in children is common, while mediastinal tumor is rare; and, most important of all, benign tumors which are operable. In this last case the long continuance without marked increase of the symptoms is the chief aid to diagnosis, except when a connection with the thyroid gland can be made out.

The treatment of tumors in the mediastinum is possible only in the cases which are fit for operation; in all others we can only seek to relieve the symptoms. Leeches applied to the suprasternal notch or large sinapisms to the chest will sometimes relieve the dyspnœa. The physician is often driven to try tracheotomy to relieve this most distressing symptom, but this is useless, the compression being too far down, and the insertion of a cannula being apt to set up dangerous inflammation, even pressure gangrene. In the last stages pain may be so great as to defy opiates, but it may partially yield to the application of a large ice-bag to the chest or to the constant electric current with large flat electrodes. Hoffman got temporary relief in one very obstinate case by injecting carbolic acid into the tumor. All varieties of counter-irritation have been tried, from wet and dry cupping to *Baunscheidtismus*, but without encouraging results.

MEDIASTINITIS.—Inflammations of the mediastinum may be described as traumatic, extension, metastatic. The first class is caused by external wounds or injuries from foreign bodies in the œsophagus, instances of which are not infrequent, judging from Hare's statistics. Those which belong to the second class are the most common, and may be non-suppurative, suppurative, or tuberculous. The non-suppurative are secondary to pericarditis or pleuritis. Hare has collected sixteen such cases. Suppurative inflammation may extend from the neck along the large vessels, or from the larynx and trachea, or from the œsophagus, or from suppurating retro-pharyngeal glands in children, or from suppuration in the lungs or thymus or bronchial glands.

Tuberculous inflammation extends from the vertebræ or lymph glands, and is generally suppurative also. Metastatic mediastinitis has been found in typhoid fever and erysipelas, and in a few instances of acute articular rheumatism, pneumonia, and smallpox. It is much more common in men than in women; the proportion, according to Hare, being as fifty-eight to seven.

Mediastinal abscesses are apt to force their way through to the surface of the chest, but they have been known to break into the trachea, œsophagus, pleural cavity, pericardial sac, left ventricle, and aorta.

The symptoms are as follows: throbbing pain in the chest and back, increasing until the abscess is formed or until it evacuates; a feeling of heat and fulness; fever, chills, sweating, and rapid pulse. Symptoms of compression resemble those in tumors. Physical signs are usually absent until the abscess is fully enough developed to give symptoms of compression and suppuration. Œdema over the sternum is a valuable diagnostic point; the rapid course of the disease is also important.

Treatment consists in opening and draining the abscess, sometimes by resection of a part of the sternum. Heyfelder reviews twenty-five cases of resection with fifteen recoveries. Hemorrhage and emphysema of the mediastinum have been reported following wounds of the chest, œsophagus, or trachea. The latter is usually not fatal, even when the tissues of the neck and chest are filled with air. Knistern reports an interesting case in which the heart sounds were completely obliterated and a tympanitic resonance was heard over the heart dulness and over the upper part of the liver; but the air was rapidly absorbed and a complete recovery followed.

Very little is known of syphilis of the mediastinum. It appears to be usually regarded as an extension from gummata of the sternum or ribs. Weber had a case of gumma of the inner surface of the sternum with enlargement of the mediastinal glands. These large masses give rise to symptoms like those of tumors, and their true nature is revealed only at autopsy. *Alice Hamilton.*

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MEDICAL LAKE.—Spokane County, Washington.

POST-OFFICE.—Medical Lake. Hotels.

ACCESS.—Viâ Central Washington branch of the Northern Pacific Railroad to Cheney; thence eight miles northwest to lake.

This remarkable body of water is about a mile and a half in length by one-half mile in width. It is located on an elevated plateau, and is surrounded by an evergreen border of pine, fir, and tamarack. There are four good hotels on the lake, commodious bathhouses, splendid drives, delightful camping places, and an abundance of fish in the neighboring lakes. The East Washington Hospital for the Insane is also located here. The waters of the Medical Lake were analyzed by G. A. Mariner in 1882, with the following result:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Sodium carbonate	63.54
Lithium	Trace.
Magnesium carbonate	.23
Iron carbonate	.53
Calcium carbonate	.18
Sodium chloride	16.37
Potassium chloride	9.24
Aluminum oxide	.18
Sodium metasilicate	10.63
Potassium sulphate	Trace.
Sodium biborate	Trace.
Organic matter	.55
Total	101.45

The water has excellent properties as an antacid, laxative, and diuretic. It is used commercially. The evaporated salts resulting from distillation are also packed and shipped to different sections of the country. It is said that an excellent quality of soap is prepared from the residue. *James K. Crook.*

MEDICATING, MODES OF.—Medicines act only by coming into actual contact with the part *primarily* to be impressed, and the various *modes of medicating*, so called, are simply different methods for securing such contact, varying according to circumstances. Modes of medicating fall naturally into two categories, namely, first, modes of direct medication of surface parts immediately accessible to local application; and, secondly,

modes of medicating internal parts accessible only through the avenue of the blood. Medication by any of the methods of the first category is commonly spoken of as *local* medication; and by any of the modes of the second category as *general* medication. But concerning this phrase "general medication," the point must be noted that, although in one sense medicating by the avenue of the blood is always "general," for the reason that the medicine necessarily goes wherever the blood circulates, yet the *therapeutic application* is in many instances as purely local as if the drug had been locally applied from without. Thus, for instance, copaiba, swallowed, circulates generally with the blood, in which its virtues become dissolved, but yet the main influence of the drug and the entire therapeutic purpose thereof are commonly upon the surface of the urethral mucous membrane, with which the medicine comes into contact by excretion by the kidneys, dissolved in the urine.

I. MODES OF MEDICATING BY DIRECT APPLICATION.—In medicating the *skin*, the following points are to be noted: *First*, although the skin is comparatively insensitive and non-absorbent and so will bear stronger applications than will mucous membranes, yet there are many substances that will severely irritate even the sound skin, and many others that can be absorbed by the skin in sufficient quantity to produce constitutional effects; *secondly*, different parts of the skin differ greatly in sensitiveness, thin parts being more sensitive than thick, and, similarly, individual skins will vary in tenderness, thin and fine-textured skins being more sensitive than the coarse and thick. Also, of course, a *clean* skin is more readily affected than is a long-unwashed and dirty one. The *third* point is, that in the medication of hairy portions of skin, the effect will be far more thorough if the hair be shaved, or at least cut short, before the application is made. *Fourthly*, it is to be remembered that the skin, as a whole, constitutes an organ whose functions it will not do wholly to suppress. The persistent covering of the entire skin with matters impervious to the air is therefore fraught with mischief, and even danger.

Besides the skin, the *mucous membranes* present surfaces more or less accessible for direct medication. Here, far more than in the case of the skin, is to be found a great difference in sensitiveness in different parts. According to locality, therefore, applications intended for mucous membranes must vary widely in strength. The *least* sensitive mucous membranes are those of the *alimentary canal*, and of the *female generative organs;* the *middling* sensitive are those of the *conjunctiva*, the *air passages* beyond the larynx, the *middle ear*, the *lower* portion of the *nasal cavity*, and the *urethra;* while the *extremely* sensitive are the mucous surfaces, respectively, of the *cornea*, the *upper* portion of the *nasal cavity*, and the *larynx*. Another point is the very different degree of *accessibility* of mucous membranes. Some mucous membranes, as for instance that of the mouth, are as easily accessible as the skin itself, while others, such as that of the bladder, can be reached only by special instrumental appliances. The practical points concerned in medicating the different mucous membranes are as follows:

Medication of the Conjunctiva.—The conjunctiva is directly accessible, and medicaments can be applied in solution, in ointment, in powder, or, as in the case of nitrate of silver, by a touch of the solid substance. The only technical point in medicating the conjunctiva is thoroughly to expose the retrotarsal fold for the application, when, as happens in the majority of cases in conjunctival affections, the point of greatest intensity of the disease is situated exactly in that locality. To this end the patient should be directed to cast the eyes strongly downward, while the surgeon draws the everted upper lid upward and backward. Another caution well to note in this place is to avoid any application of a salt of *lead*, if there be any loss of the epithelium of the cornea, whether by an ulcer or an abrasion. This, because upon any exposed surface of corneal tissue proper, the application of a lead solution will determine an indelible, white opacity.

Medication of the Nasal Cavity.—The *lower* portion of the nasal cavity may be medicated by the snuffing up of dry powders or of solutions—a very imperfect measure in either case. More thorough is the blowing in of powders by a blast from a rubber bag, or the injection of solutions. But, as regards the latter procedure, the danger must be remembered of the injected fluid passing up the Eustachian tube to the middle ear, with, possibly, disastrous consequences. Direct injection from the anterior nares, and the so-called *nasal douche*, where the injected fluid enters one nostril and, passing around, escapes anteriorly by the other, are measures nowadays very justly condemned by the majority of practitioners. The safest means of flushing the nasal cavity with a solution is by the *posterior nasal syringe*, but even this measure is accused of occasionally producing middle-ear inflammation. *Atomized spray*, driven into the nose from before or behind, is, naturally, far safer than solutions in bulk. To medicate the *upper* portion of the nasal cavity, the same means are available as just described, with the same inherent dangers; the only point to note being that this same upper portion of the Schneiderian membrane is very much more sensitive on the one hand, and difficult of access on the other, than the lower. It is often doubtful whether insufflations or injections, whether of solutions in bulk or of spray, reach the upper regions of the nasal cavity at all. The mucous cavities, respectively, of the ethmoid and sphenoid bones, the frontal sinuses, and the antrum are practically inaccessible to direct medication.

Medication of the Eustachian Tube and Middle Ear.—In cases of perforation of the ear drum the middle ear is accessible to injections through the external auditory canal, but otherwise can be reached only by injections or insufflations through the *Eustachian catheter*, a specially shaped catheter introduced through the nostril so as just to engage the opening of the Eustachian tube. Concerning medication through the Eustachian catheter, the only points proper to note in this article are that, in the first place, the manipulation of the catheter itself requires technical knowledge and skill, and in the second that the mucous surfaces under consideration are very sensitive to irritation, so that mischief instead of benefit may easily result from over-zealous practice of direct medication.

Medication of the Mouth and Pharynx.—The *mouth* may be medicated by mouth-washes, by troches, or by direct localized application at the hands of the surgeon in any of the ordinary ways. The *pharynx* is medicated by applications of spray, by injections by means of the posterior nasal syringe, or by solutions exactly applied by a mop attached to a properly shaped handle introduced through the mouth. Strong applications are best made by the latter method, since sprays and injections may, undesirably, find their way into the larynx or into the posterior nares. *Gargling* is fairly efficacious for medicating parts anterior to the faucial arch, but is of little avail for affecting the pharyngeal region.

Medication of the Larynx.—The larynx is medicated by the inhalation of vapors or of solutions in spray, or, at the hands of the surgeon, by local touch by means of special probangs applied with the help of a view in the laryngoscope. Technical training and a delicate hand are necessary in laryngeal manipulation, and the extreme sensitiveness of the mucous membrane of the larynx to irritant applications must ever be borne in mind.

Medication of the Respiratory Mucous Membrane beyond the Larynx.—The air passages beyond the larynx can be medicated directly only by *inhalation*. Vapors and solutions in spray can be inhaled with a view to medicinal effect, but the *vapors* must be such as are non-irritant, and as regards *sprays*, the whole drift of exact observation tends to strengthen the belief that fluids inhaled in spray never penetrate beyond the larger bronchial tubes.

Medication of the Bladder and Urethra.—The *urethra* is accessible by injections, by medicated "bougies" of cacao butter, and by the sound, smeared with the medicament in ointment or in any pasty condition. The *bladder*