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in Diseases of the Upper
Air-Passages.

BY

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REPRINTED FROM

The New York Medical Journal

for September 11, 1886.



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OBSERVATIONS ON THE USE OF SOME OF THE
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UPPER AIR-PASSAGES.*

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THERE is, perhaps, no department of medical science which has enlisted more interest during the last few years than that of therapeutics, and it ought to awaken in us the strongest feelings of pride and encouragement to see the mist of empiricism which has for so many ages obscured this field gradually dissipating before the light of scientific progress. The results already obtained have been, in great measure, due to the aid which chemistry and physiology have furnished clinical medicine, the former by resolving drugs into their proximate principles, and the latter by pointing out the effects of these upon the tissues and functions of the healthy economy. Now, no department of practical medicine, it seems to me, stands more in need of scientific guidance for its therapeutics than laryngology; for the selection of applications, with few exceptions, depends more upon individual experience and

* Read before the American Laryngological Association at its eighth annual congress.

experiment, or empiricism, than scientific principles. Therefore, it would seem that we ought to rigidly study the proximate and remote effects of the application of medicinal agents to the air-passages, and their influence in relation to systemic treatment of various sorts, in the hope of evolving with certainty the hidden facts regarding the relationship between the condition of the part and the absolute effect of the medicament. Pursuant to this line of thought I have, for the past eighteen months or so, been studying the effects of some of the alkaloids and glucosides when used topically. I do not present these observations as conclusive, only with a view of eliciting interest and discussion. I shall omit the general therapy of these drugs, of course, referring to some effects only.

Aconitine.—I have records of twenty-five cases in which it was used either in the form of a spray or pigment. Two were cases of laryngeal phthisis; seven of chronic pharyngitis—in five of which there existed acute exacerbation; eight of acute pharyngo-laryngitis; three of chronic follicular amygdalitis; three of chronic laryngitis; and two of pharyngeal neuralgia. The amount used each time varied from $\frac{1}{480}$ to $\frac{1}{130}$ of a grain. In each instance there occurred in a few minutes the well-known physiological effects of tingling of the tongue and feeling of choking and numbness, to which was superadded, when applied in the nasal fossæ, lacrymation, with sneezing and vertigo. On two occasions these local symptoms were very severe and distressing to witness.

Only once did I observe a marked effect on the pulse immediately after the application. With a small dose — $\frac{1}{480}$ grain—these symptoms passed away in about two hours; with the larger doses from four to six hours elapsed before the patient became comfortable.

As to the local effect, in every case there arose in a very

short time, almost immediately, an active hyperæmia. Even in the case of phthisis the pale color was deepened to a vivid rose, or a near approach to it. The ulterior effect was, in the acute cases, to cut short the course of local inflammation; in the cases of chronic pharyngitis, etc., there was no permanent effect, the cases of pharyngeal neuralgia—severe paroxysmal pain on one or other side of the pharynx—occurring in a pregnant woman, and a woman suffering with supposed chronic inflammation of the ovary respectively. The application of the pigment with a brush twice daily produced immediate and marked relief, although not a cure.

From these observations, therefore, I think that this agent as a local application was of little benefit, except in a few particular cases, while its very unpleasant effect upon the sensations of the patient was entirely out of proportion to its therapeutic value.

Agaricin (a glucoside from the *Boletus laricis*).—From the good effects in the abatement of nocturnal sweating, which I have observed from the administration of this agent, I was led to use it topically in a few cases of chronic nasal and pharyngeal disease, but, as I did not observe any physical or therapeutic effect, I have nothing to report at present.

Arbor Vitæ.—On account of its reputed efficacy in causing the disappearance of syphilitic warts, I was led to use this drug as an application to intra-laryngeal papillomata. In one case, that of a boy fourteen years of age, who was suffering with a progressive growth of these tumors on the vocal cords and ventricular bands, it certainly acted remarkably well. Only one of the growths—the largest—was removed by the forceps, the others disappearing under the use of a spray of the aqueous extract, applied once or twice daily, for a period of about three

months. Perhaps some of the gentlemen will remember having seen this patient in my office during the time of the last meeting of this association in Detroit; if so, you will remember that we all concluded that, on account of the imminent prospect of suffocation, tracheotomy would soon be necessary. There is not a vestige of a neoplasm in his larynx now. I will add that a renewal of the growths took place in February, but speedily disappeared again under this treatment.

In another case, in an adult, where there were five papillomata in the region of the anterior commissure of the vocal cords, this remedy only partially succeeded, the forceps having been resorted to for the larger ones. The treatment, however, seemed to prevent their renewed growth.

In still another case, one of cystic tumor of the right vocal cord, the arbor vitæ has had no effect whatever, unless, perhaps, to suppress catarrhal inflammation. Whether this action of the drug is due to any specific property, or simply its astringent property, I do not know. I am aware that there are cases on record of like results following the use of tannic acid, but in my experience I can remember only one case of this kind where the application of tannic acid seemed to take any part in the dissipation of the growth.

I have also used arbor vitæ in the local treatment of some cases of chronic laryngitis with benefit.

In preparing the fluid extract for spray, to render it un-irritating, it will be necessary to drive off nearly all the alcohol by means of heat, boiling it down to a syrupy consistence, and afterward add water to the amount of one third to one half of the amount distilled off, then filter.

Ammonium Glycyrrhizate.—As a spray I have obtained no particular effects. I have prescribed it for a large number of cases of acute and chronic bronchial catarrh, in doses

ranging between two and five grains. In the chronic cases it seemed inferior to ammonium chloride and ammonium iodide, but in the acute uncomplicated cases it has proved itself a valuable expectorant.

Cannabine Tannate (from *Cannabis indica*).—On account of the difficulty of making a solution of this substance, I have used it mostly in the form of powder mixed with starch, or in the form of an ointment with vaseline. I have used it in about fifty different cases, sixteen of which I have notes of, and a majority of these were cases of nasal or naso-pharyngeal disease. It possesses astringent properties, and is also a decided local stimulant. When applied undiluted to the nasal mucous membrane it causes considerable irritation, which lasts for a period of two to four hours, producing lacrymation and swelling of the turbinated mucous membrane. But when applied diluted with starch in the proportion of two to five grains to the drachm, or with vaseline in like proportion, it has, as a rule, no such irritation, but a decided astringent, and afterward soothing effect. It has proved a valuable agent, according to my experience, as a substitute for tannic acid, which latter I have ceased to use in the nasal chambers on account of its irritating effect; with children suffering from swelling of the nasal mucous membrane, either acute or subacute, it will prove an excellent and efficient application, especially when mixed with vaseline.

Cadmium Sulphate.—This salt, which has been highly extolled as an astringent, I believe is not superior to sulphate or chloride of zinc. I have used it as a spray and pigment in about thirty cases, in the proportion of from one half to five grains to the ounce, and have noted no particularly beneficial result over zinc sulphate and chloride or silver nitrate, excepting in one case where the unpleasant results following the application of any solution of silver ni-

trate forbade its use. The cadmium certainly acted well, and seemed to bring about the desired result.

Cotoin (the active principle of coto bark).—Although there is not much literature upon this subject, it is reputed to be a good remedy for chronic diarrhœa and the diarrhœa of phthisis. I have administered it in two cases of diarrhœa of phthisis, but without signal success. I have used it locally in about twenty cases of nasal and pharyngeal disease, twelve of which I have notes of. It is a powerful irritant to the nasal and pharyngeal mucous membrane—both healthy and diseased—and leaves no reactionary effect. Its best effects are obtained in cases of atrophic nasal and pharyngeal catarrh, and, when diluted in starch or sugar in the proportion of one part to three or four of excipient, it is, I think, quite equal if not superior to any other application—excepting galvanism.

Coniine Hydrochlorate (a salt of the alkaloid of *Conium maculatum*).—From the well-known selective action of conium on the muscular system and sympathetic nerve, one would suppose that this alkaloid—readily diffusible as it is—would act signally as a corrective in those local disorders of the throat and larynx characterized either by co-ordinate or ordinate spasm, etc.

I have notes of ten cases representing various spasmodic actions of a pathological nature of the pharynx and larynx, one of which was an hysterical laryngeal cough, and one a local chorea, in which I applied this agent repeatedly in progressive doses (both by means of spray and pigment) without any sensible result in modifying the diseased action. I am therefore disposed to regard it as wanting in value for a local medicament.

Cocaine.—As medical literature is already surfeited with items regarding this remarkable drug, I will spare your feelings and pass it by.

Daturine (an alkaloid from *Datura stramonium*).—From the known value of stramonium as an anti-spasmodic, and its especial utility in the relief of spasmodic asthma, I was led to give this alkaloid a thorough trial as a topical remedy in affections of this sort.

I have notes of twenty-three cases subjected to experiment, as follows: 1, bronchial asthma; 1, spasmodic asthma; 2, periodic laryngeal congestion; 3, hay fever; 1, chronic bronchitis (bronchorrhœa); 3, hysterical pharyngeal catarrh; 5, influenza; 1, laryngismus (with ovarian disease); 2, chronic naso-pharyngeal catarrh; 2, acute coryza; 2, chronic laryngitis.

The dose varied from $\frac{1}{100}$ to $\frac{1}{50}$ of a grain, and in some of the cases was repeated two, three, or four times a day; in each case, when the dose was large enough or frequently enough repeated, there appeared to the patient sooner or later the characteristic sensation of dryness of the fauces, etc. The patients with asthma were not sensibly affected by the treatment; two of those with hay fever were very much benefited by the applications if repeated often enough (it was used in the form of spray), but the trouble was not arrested; three of those with influenza were decidedly relieved by three applications daily of a spray ($\frac{1}{100}$ of a grain), while the two others were not at all relieved. The neurotic cases were only relieved by a diminution of secretion, which, however, lasted but a few hours, necessitating a repetition of the dose. In the other cases I could observe no particular effects.

Ethyl Bromide.—This has been used almost entirely as an inhalation for the relief of cough. I have tried it in a large number of cases; it is not quite so efficacious as chloroform, but there is much less general anæsthesia from its continued use, and it leaves no unpleasant after-effects. I think, therefore, that it is deserving of more ex-

tended use for the relief of severe dry cough and spasmodic asthma.

Hyoscyine.—The hydrobromate is the salt which has been used. I have been unable to note any marked effect, proximate or remote, from the local use of this salt—excepting in a few cases there arose a sensation of dryness which passed off in about an hour.

It produces no apparent change in the condition of the mucous membrane to which it is applied. The doses used varied from $\frac{1}{400}$ to $\frac{1}{150}$ of a grain.

Hydrastine (alkaloid from *Hydrastis canadensis*).—I have had but a limited experience with this drug, for, seeing no particular effects, and hearing such *bitter* complaints from those to whom I had applied it, I soon abandoned its further employment.

Iodol.—I have used iodol in a few cases of ulceration of the mucous membrane, both specific and ordinary, and observed that it has nothing like the power to arrest the ulcerative process which iodoform possesses, although I can not say but that slow improvement and healing followed its use. It is sincerely to be hoped that this substance will prove to be a capable substitute for iodoform, because it is free from odor and causes no bad taste. I have always applied it by insufflation.

Papain (papaw juice).—In one case of diphtheria I applied the fresh juice, and in six other cases it was used in the form of a glycerole—either one half or two thirds strength; but no solvent action was observed on the exudate in any case. I may add that this was the experience of two other practitioners in our city, who also tried the remedy in cases of diphtheria. Therefore, so far as this limited experience goes, it has utterly failed to sustain its reputation as a remedy for the relief of real diphtheria.

Muscarine Sulphate (alkaloid of *Agaricus muscarius*).

—Very little is known about this drug, but it is said to resemble in its physiological action that of physostigmine. I have applied it in doses of from $\frac{1}{50}$ to $\frac{1}{10}$ of a grain in twelve cases characterized by dryness of fauces and larynx, without any result excepting in two. One of these patients presented signs of great dryness of the fauces, and lack of buccal and salivary secretion, accompanying general nervous prostration; and the other had “dry catarrh” of the pharynx and larynx. In both of these cases a spray, repeated three or four times a day, seemed to afford great relief. The immediate effect was a pleasant tingling sensation, soon followed by comfortable heat and more secretion. No effect on the pupil was observed. In the other cases no immediate or remote effects, either objective or subjective, could be observed.

Physostigmine Salicylate.—This was thoroughly tried in a number of instances, of which I have six recorded. In but one instance did it produce any physiological action, or in any obvious way relieve the pathological condition of the parts. This case was that of a delicate young man who had from time to time suffered from spasmodic stricture of the lower pharynx and œsophagus; he experienced almost immediate relief from an application of $\frac{1}{20}$ of a grain, which lasted about six hours, when another application became necessary. At the end of forty-eight hours the attack ceased. Nothing which I had ever used locally in this man's case had acted so well as this agent in cutting short the course of the attacks.

Pilocarpine Hydrochloride.—I have five recorded cases of pharyngeal catarrh characterized by a sensation of dryness and consequent distress in which I have tried this remedy, in doses varying from $\frac{1}{50}$ to $\frac{1}{4}$ of a grain, but without any positive result.

Piscidin (a glucoside from *Piscidia erythrina*).—I have

nine cases recorded in which this was used either as spray or pigment, in doses ranging from $\frac{1}{480}$ to $\frac{1}{24}$ of a grain. In only one instance could there be observed any proximate or remote effect, and that was a case of phthisis characterized by a very persistent and aggravated sensation of tickling referred to the pharynx. In this subject the application of a pigment in the proportion of $\frac{1}{120}$ of a grain to the drachm, every two or four hours, seemed to relieve the trouble in two days.

Resorcin.—Although attention was first called to this agent in 1860—when it was presented as a supposed substitute for carbolic acid—yet medical literature does not show that it has been at all extensively used until very recently. I have used it considerably during the past year, and believe it to be an important addition to the pharmacopœia. It is practically odorless and tasteless, while it is soluble in water; it is very feebly caustic, and, although a weak, still an efficient antiseptic. I have the records of thirteen cases in detail in which resorcin was used with good effect. Three were secondary syphilitic ulceration; one, tertiary; six, ozæna—of which one was an aggravated case where the turbinated bones had disappeared; one, eczematous lupus of nose and pharynx; one, ulcerating and eczematous lupus; and one, typical herpetic pharyngitis.

The case of ulcerating lupus needs some additional remarks, inasmuch as it was a peculiar one; the subject, a child nine years old, had been suffering for nine months; first, with an obstruction of the nasal passages and an irritating discharge therefrom, followed gradually by the growth of fungous granulations in these passages and about the edges of the nares and upon the roof of the mouth (about the center of the hard palate). When I saw her in February, 1886, there were extensive ulcerating granulations in the nasal passages and upon the surface of the roof of the mouth

as well as at the margins of the nares; the nasal column was also ulcerated and its cartilage denuded. The patient's general condition was also much below par. Having anæsthetized her, I destroyed with the galvano-cautery all the fungous tissue that I could reach and applied iodoform thoroughly. The iodoform was applied for several days, as was also resorcin (in the proportion of one to four and one to six), but the main treatment afterward consisted of resorcin used as a spray or pigment. The galvano-cautery was applied to two small spots in the mouth once since, but otherwise the treatment has consisted of the application of resorcin (and vaseline to moisten the parts) every day, conjoined, of course, with a recuperative and tonic plan of treatment. I saw the patient last on the fifth of this month (May), and observed that she was in good health, with very little deformity about the nose, and no reappearance of the trouble excepting at a spot situated on the inside of the cartilaginous nasal column. She is still under treatment. In the cases of ozæna, especially the one with the loss of the turbinated bones, the effects of this agent, used once or twice daily, as spray, were quite prompt, and it seems to me remarkable. The patient was under treatment about five weeks. I saw him about two weeks ago, and he told me that he was comparatively free from trouble, and had been for the last three months; he uses a douche every day (as might be expected) of salt and water. Has no pain now and no more discomfort than is usual for ever after such a lesion. The ulcerative process is apparently checked.

Sanguinarine Nitrate (a salt of the alkaloid of *Sanguinaria canadensis*).—No special results follow the local use of this drug, but for internal administration in a certain class of cases it is highly useful as a stimulating expectorant. I have noticed no unpleasant effects or depression from it in doses of $\frac{1}{10}$ to $\frac{1}{4}$ of a grain in syrup. I regret that the

time allotted to this paper necessitates the omission of many important details connected with the study of these agents, but hope this imperfect and compressed report, as it were, may serve the purpose of inducing some of the gentlemen present to take the subject up for particular clinical study.

I trust that I may be able next year to add something further of interest in this line of work.

DISCUSSION.

Dr. MAJOR.—Having been in the habit of using aconite in the form of spray in the treatment of inflammation of the upper air-passages, I have noticed that the effect of the drug is more marked and more rapid than when used for the bronchial mucous membrane. In one case I was using a solution containing four or five minims in the form of a spray, when the patient became pallid and depressed and presented the usual appearances of aconite poisoning. Although I use it constantly and consider it a specific, especially at the outset, yet I wish to call attention to the increased effect of aconite when it reaches the system by the way of the respiratory passages.

Dr. MACKENZIE.—I think the same rule will apply to most drugs when administered by way of the respiratory passages, and therefore would regard the application of powerful drugs like aconite in spray as rather a hazardous procedure. I have made some experiments during the last four or five months with the dioxide of hydrogen in chronic suppurative catarrh of the nose, larynx, and pharynx by internal administration. I commenced its use in old cases which had resisted almost all kinds of treatment, internal and local. The success was such as to warrant me in continuing the trial. I used a four-per-cent. solution. I first commenced with a six-per-cent. solution, but afterward reduced it to four, which keeps better. The usual dose is two or three drachms of the four-per-cent. solution, to be taken three or four times a day, keeping it up for a few weeks. In a fair proportion of cases the discharge was certainly arrested by this means alone. In two cases the result

was very marked, and in others the discharge was very much reduced.

Dr. S. SOLIS-COHEN.—I have been much interested in Dr. Mackenzie's remarks concerning hydrogen dioxide. I have not used it internally in catarrhal cases, but I have seen good results from its administration in phthisis, as originally recommended years ago by Dr. Benjamin Ward Richardson. I usually give a drachm of a ten-per-cent. solution very much diluted. It generally seems to agree with the patient and to improve nutrition. Its use is frequently attended with a notable reduction in the pulse rate, a phenomenon I have not seen mentioned in the text-books or in special articles on this drug. In one case this became so marked that I was obliged to discontinue its use. Further than this, I only noticed the best results in improvement in the general condition; and in cleansing, if I may use the term, the secretions from the larynx, I have used aconite and have seen no bad results from its use. I employ it, however, in the form of the oleate as reported to the association last year, and not as a spray. In this form we are more likely to obtain maximum local effect with minimum constitutional disturbance. I apply it with a brush or a wad of cotton; a two-per-cent. solution in oleic acid. After three years' experience, I can say that it certainly reduces inflammation and subdues pain. In some instances it answers better than cocaine. The effects are more lasting. Some patients complain of its taste, others say it is rather agreeable. Ethyl iodide by inhalation is useful to control foetid secretions, and may sometimes be used as a substitute for iodoform. It has proved useful in foetid rhinitis, syphilitic and non-syphilitic. While on my part I would like to recall attention to the advantages of an old method of administering the recent vapor of ammonium chloride, the method of Lewin, in which the patient inhales the vapors arising from the mingling of the vapors of hydrochloric acid and of ammonia, I have seen remarkable effects from its use in old cases of foetid catarrh. In order to remove the irritating qualities, the vapor should be washed twice; in the second wash-bottle I sometimes place a little terebene or thymol. This makes the vapor rather pleasing, and possibly adds to the thera-

peutic efficacy. The thymol alone has, however, failed to produce any decided results.

Dr. MORGAN.—In regard to aconite and its various preparations, when employed therapeutically in the upper air-passages, my experience had been both extensive and thoroughly satisfactory. For years I have made use of the tincture of aconite-root—in the form of spray, gargarism, pigment, etc.—in treating acute and subacute inflammatory diseases of the nares, pharynx, larynx, and trachea. Aconite, I believe, has a direct and local specific effect upon the respiratory mucous membrane, and, if cautiously and judiciously applied, is invaluable to the laryngologist.

I have long noticed that a spray of tincture of aconite-root, one to one hundred of water, is absorbed by the bronchial mucous membrane with wonderful celerity, and both the local and general effects of the drug become well marked in a few seconds. Aconite, apparently, acts much more rapidly than other drugs when brought in contact with the respiratory membrane. For irritative cough arising from nasal, pharyngeal, laryngeal, tracheal, or even bronchial hyperæmia, a spray of the tincture of aconite-root, ℥ x to f ʒ iv of water, is followed by the greatest relief.

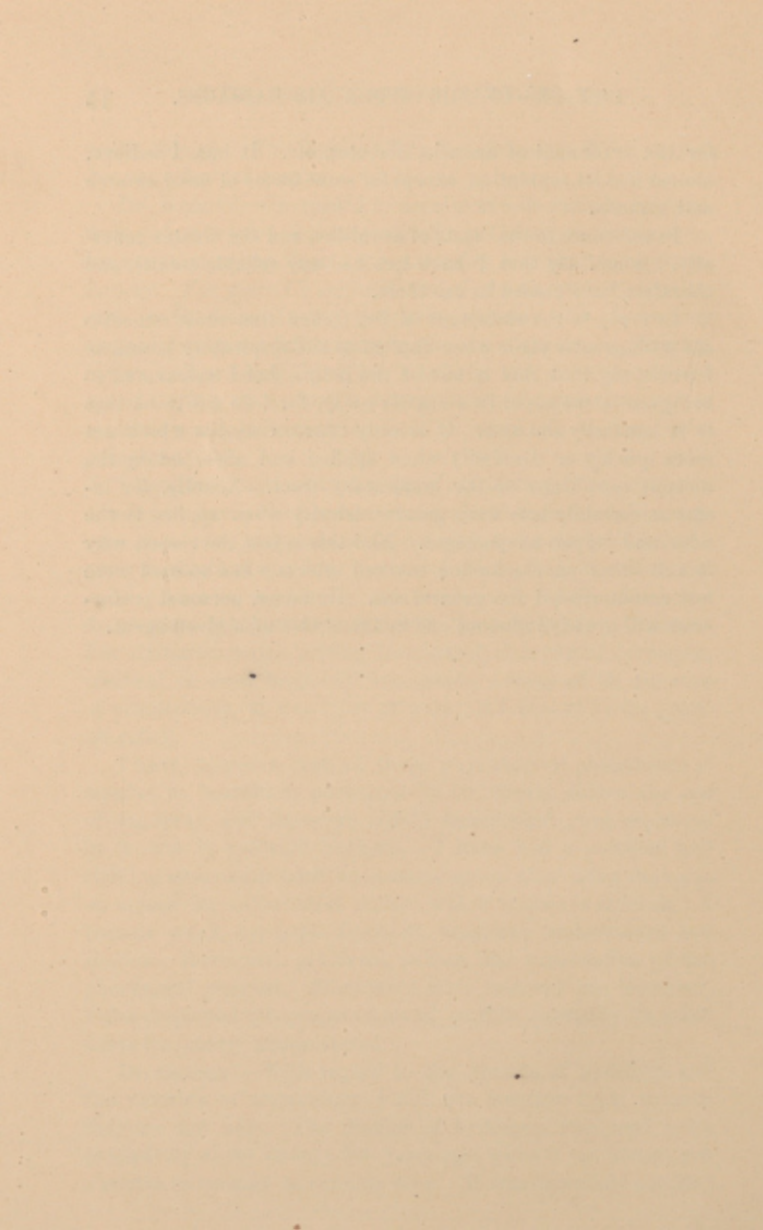
I have, however, seen all those physiological phenomena of aconite, so beautifully portrayed by Dr. Shurly, follow the use of the spray, and therefore would recommend circumspection in its use in asthenic patients. I have had a personal and striking experience with an aconite spray, after using the same on myself for an irritative cough, which it always controls. I became weak, my pulse frequent, breathing embarrassed and shallow; there were giddiness, nausea, and constriction of the pharyngeal muscles. Stimulants soon restored me, however. I also employed the preparations of aconite internally, in small doses frequently administered.

Dr. SHURLY.—With regard to the dioxide of hydrogen and the chloride of ammonium, I did not mention them because they are not new. The dioxide of hydrogen was used quite extensively about twenty-five years ago, when it ran about such a course as cocaine is running now. It was especially extolled

for the treatment of anæmia, diabetes, etc. It has, I believe, almost lost its reputation, except for some forms of nasal catarrh and wounds.

In reference to the oleate of aconitine, and the oleates generally, I would say that I have not had any reliable results, and therefore have ceased to use them.

In reply to the statement of Dr. Cohen that most remedies act with greater vigor when applied to the respiratory passages, I would say that this is one of the points that I endeavored to bring out in the paper in a negative way, for I do not think that it is generally the case. It is only CERTAIN agents which act more quickly or decidedly when applied and absorbed by the mucous membrane of the respiratory tract. Aconite, for instance, certainly acts with greater celerity when applied to the nose and upper air-passages. And this is just the reason why it and other agents having marked effects when so used were not recommended for general use. However, personal preference will greatly influence one in the choice of a given agent.





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