

REGIONAL IODINE
THERAPY

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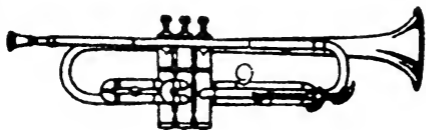
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A Treatise
on
Regional Iodine
Therapy

for
The Veterinary Clinician

by
MART R. STEFFEN, M.D.C., V.S.

Author of Special Veterinary Therapy,
Special Cattle Therapy, Clinical
Diagnosis of Cattle Diseases,
Special Equine Therapy,
Veterinary Clinical
Notes, etc.

1919

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I.

Introduction.

In presenting to the veterinary profession this treatise on Regional Iodine Therapy, I do so with the object of bringing into the light certain clinical facts that have to do with the topical application of iodine in veterinary patients, and to discuss, from the standpoint of the clinician, those particular pathological conditions to which these facts apply.

It will be further my purpose to point out to the reader the special indications for topical iodine medication which have, in the past, been overlooked by the practitioner of veterinary medicine.

Throughout the treatise I shall confine myself to the exposition of only such matter as I have found to be compatible with the practical phases of veterinary science in the conduct of my own practice.

M. R. S.

Milwaukee, Wis.

March, 1919.

II.

General Considerations of Local Iodine Therapy.

While it is a fact that iodine is one of the most popular of the many medicinal agents used by the practitioner of veterinary medicine and surgery, it also is a fact that iodine—more so than any other agent—is frequently used in pathological conditions and under circumstances that lack every scientific indication for its application. To a certain extent this is true of almost any medicinal agent in common use, even those whose field of applicability is less broad than that of iodine; but it is especially noteworthy in the use of iodine.

Iodine does not differ from any other therapeutic agent with regard to individual indications for its application; it has these as prominently marked as have the alkaloids, physiologically.

But it does differ from almost all other therapeutical agents in the fact that, it has such a vast field of applicability in which the indications for its use are supported solely by clinical evidence and in which its action defies all attempts at an explanation of results attained, on a physiological basis.

Although the practitioner may not be able to satisfy his ethical desire to explain the action of preparations of iodine in the latter class of pathological conditions, he soon makes the discovery that these actions and results are, to a very considerable degree, dependent upon more or less well-marked clinical and physical phenomena. In order to be able to give to his use of iodine, in its various forms, even a semblance of ethical practice, and, also, in order to be able to roughly classify and select the conditions in which he may use iodine with some expectation of uni-

form results, it becomes imperative that the practitioner acquaint himself with these facts and phenomena. Not only this, but he must acquaint himself, as well, with the peculiar and individual effects and actions, in a clinical sense, of the different forms in which iodine is used as a topical or regional application.

What may be an indication for the use of iodine in one form, may lack the requisite pathological status for its application in a successful manner in one of its other forms. Thus, in a given pathological condition, an ointment of iodine may fall far short of the therapeutic power that the practitioner expects it to exert, despite the fact that the case is clearly one for iodine therapy. When, on the other hand, in the same case, use is made of the tincture of iodine, or of an aqueous solution of iodine, the desired results may be ob-

tained with almost amazing promptness. Again, in another class of cases, the reverse may be true.

Although, in a goodly proportion of the cases to be discussed in the following chapters in this treatise, the practitioner must come into direct and frequent clinical contact with the pathological conditions themselves in order to become thoroughly acquainted with the clinical and physical facts referred to, he will derive much benefit from a careful reading of these chapters, to the extent that he will note not only new lines of thought with regard to iodine medication, but he may also lay, in their reading, the foundation for an ethical system of iodine therapy in so far as this is possible in the light of our present acquaintance with the subject.

III.

Special Considerations of Local Iodine Therapy.

When we undertake the consideration of those features of iodine therapy which have to do with its adaptability to definite remedial ends, we enter upon a field of thought that may take several forms.

We are concerned, in this treatise, only with matter relating to regional, topical, or local applications of the agent under discussion, and we can well begin the consideration with the identification of the agent itself and the different forms under which it is most commonly used. For all practical purposes, we can confine the discussion of the agent itself to that of the four forms, or preparations, of iodine in almost universal use by practitioners of veterinary medicine and surgery.

When, in veterinary medicine, allusion is made to iodine, it is almost, without exception, to one of the following preparations :

1. Tincture of Iodine.
2. Ointment of Iodine.
3. Aqueous solutions of Iodine.
4. Oily solutions or mixtures of Iodine.

Only in rare cases, and then under specific reference, is iodine used in other forms, or in its elemental state, in veterinary medicine. Iodine is a very active agent, chemically as well as therapeutically, and is not readily compatible with other agents. It is for this reason, that combinations of iodine with other drugs and chemicals are not common, and therein lies a distinction for iodine that not many other therapeutic agents can claim; namely, that beneficial effects resulting from iodine medication are almost, without ques-

tion, due to it alone; it is hardly ever applied in combination with synergists which might obscure the activity of individual ingredients.

This remarkable therapeutic activity of iodine is such that, when properly applied in some of its forms, its presence can be demonstrated in the underlying tissues. After prolonged courses of topical application, its action is occasionally appreciated, both subjectively and objectively, in the evidence of more or less clearly defined constitutional or systemic indications of its presence within the animal organism.

From this, it is apparent that, in iodine preparations of a particular class, we have an agent whose topical remedial effects are, in some slight measure, due to systemic action; in part at least, this action being the effect of great physiological activity exerted in the limited area of its topical application.

In some degree this activity of certain preparations of iodine can be explained by reference to the chemical properties inherent in iodine as elemental matter, and in its well-known affinity for certain elemental constituents of the tissues of the animal organism.

The foregoing throws some light on the therapeutic accomplishments of iodine preparations, when topically applied, and, to a certain extent, explains its *modus operandi* in a physiological sense—an understanding somewhat essential from an ethical standpoint. The old theory, which would ascribe to an increase in function of the regional lymphatic glands all the agreeable therapeutic effects of local iodine applications, does not cover enough ground; it is only when we amplify this theory, with the assumption of the considerations aired in the foregoing paragraphs, that we find it possible to

attain a clear understanding of the physiological action of iodine preparations applied regionally.

The Clinical Aims for topical therapy are to be classified as follows :

1. PROPHYLACTIC.
2. AMELIORATIVE.
3. CURATIVE.

Under these three heads, we further sub-classify the actual clinical conditions, which are indicated, into the following :

Under 1. Surgical preparatory technique.

Under 2. Acute pathological conditions, in the corrections of which topical applications of iodine preparations are used as an adjunct to internal medication with other agents.

Under 3. Chronic pathological conditions, in which one or more of various iodine preparations, locally applied, constitutes the entire treatment.

This classification and sub-classification is important and essential when we endeavor to make our use of iodine conform to ethical standards; it is also very essential to the attainment of certain therapeutic ends in actual practice.

I. THE LOCAL APPLICATION OF PREPARATIONS OF IODINE IN THE SENSE OF PROPHYLACTIC AIM IN SURGERY.

The exhaustive pre-operative washing and scrubbing of the integument, that veterinary practitioners applied to their surgical patients in years past, has given way almost entirely to iodine painting. Even those surgeons who still adhere to the scrubbing and washing of the parts about to be incised,

complete the process with an application of iodine thereafter.

An application of iodine to the skin covering the region that is about to be invaded by the knife of the surgeon, has been found much more efficacious and much more reliable than has the washing and the scrubbing with antiseptic solutions, soaps and other agents. Not only this, but it has also greatly simplified and shortened an otherwise tedious, prolonged and sloppy technique. Whereas, the surgeon formerly spent from fifteen minutes to half an hour scrubbing and washing the field of operation, he now applies a few coats of iodine tincture—a few strokes of the swab or brush—and it is done.

This simplified technique has the added advantage of the total elimination of basins, brushes, and sponges for use in the preliminary stages of an

operation, as well as the agreeable absence of the wet, sloppy field that inevitably resulted from the use of the older method in veterinary practice. Besides, it spares the patient in more ways than one, especially in the cold months of the year when, in a veterinary practice, operations frequently have to be performed in cold stables, or even in the open.

While the application of tincture of iodine gives ample protection from skin infection in surgical operations, there are a few things to be observed that have to do with making the application correctly. First, in veterinary patients, the hair must be clipped off and the area shaved clean. The area clipped and shaved should be slightly greater in extent than the field actually to be invaded by the knife. When the clipping and shaving have been done, the

area should be lightly brushed with a stiff, dry brush, in order to remove dandruff and scurf.

The second—and the most important—point is that the surface that is to be painted with the tincture of iodine be perfectly dry. In the event that the area to be painted should contain a deposit of filth, oily or greasy in nature, this should first be removed by swabbing and wiping with gauze or cotton saturated with gasoline, benzine or ether; these remove oily, greasy or fatty filth and evaporate quickly, leaving the area perfectly dry and clean. Washing with watery solutions, previous to the iodine application, is not recommended under any conditions.

When the area has been clipped, shaved, freed from grease or other filth, and then allowed to become perfectly dry, the tincture of iodine is applied liberally with a soft brush, or

with a cotton swab. This is allowed to dry for a minute or two; another application is then made directly on top of the first one, allowed to evaporate to dryness, and the field is ready for the incision.

As iodine readily attacks metals, and spoils the plating on instruments, no instrument should be allowed to come in contact with the painted area while it is still moist; neither should the iodine be used for disinfecting purposes on any utensils or apparatus made of metal. The fact that the iodine may injure instruments can not be considered in the light of a disadvantage, if the above precautions are taken.

Another practice that has come to be recognized quite generally among surgeons is that of painting the edges of the surgical wound with pure tincture of iodine just before the wound is to be closed with sutures. Whether

this is good practice, on general principles, is a matter that is open to debate. If the painting is done carefully, so that a pool of iodine tincture is not formed by the surplus gathering by gravitation into the deeper recesses of the wound, this may be considered good practice. On the whole, however, it would appear that the iodine could act, in many instances, as an undesirable irritant when it comes in contact with delicate, freshly incised tissues.

As the object, in modern surgery, is to eliminate all things, even the slightest, that may hinder prompt repair and smooth healing of the invaded tissues, the presence of such an active agent as pure tincture of iodine in a surgical wound may be looked upon as interfering with the carrying out of that object.

On the other hand, in surgical wounds of an already infected character in which primary union would be out of the question, the application of pure tincture of iodine, in liberal amounts, can not be too highly endorsed.

The latter statement applies, with even greater force, to all wounds of an accidental character in the fleshy portions of the anatomy.

It is also the practice of many veterinary surgeons to apply pure tincture of iodine to the wound after the sutures have been put into place. This is a very satisfactory practice, if the painting is done gently and not too freely. An excess of the tincture of iodine—if the wound edges have not been coapted perfectly—may result in cause for stitch abscess when a considerable amount of the iodine becomes pocketed

in some part of the wound under the line of suture.

In certain animals, whose skins are very tender, the local application of pure tincture of iodine, previous to surgical incision, is followed, in a few days, by slight peeling of the integument. This is so rare an occurrence, however, and of so little consequence, that it need not be considered, and can not be looked upon as a drawback to this otherwise salutary practice.

Aside from its use in the preparation of the surgical field, tincture of iodine is also used, in a prophylactic sense, to prepare the skin—in a similar manner—for the entrance of the hypodermic needle whenever a subcutaneous injection is to be made. It is not practical, nor necessary, in this instance, to shave away the hair; the site that has been selected for the needle puncture is merely painted liberally with the iodine.

As in the case of a surgical incision area, so also here, the parts to which the application is made must be perfectly dry.

2. THE USE OF IODINE AS AN ADJUNCT TO INTERNAL MEDICATION IN THE CORRECTION OF ACUTE PATHOLOGICAL CONDITIONS.

Iodine preparations of various forms are very commonly used topically as an adjunctive treatment to internal medication in the treatment of a number of acute pathological conditions in veterinary patients. The object in adding local iodine applications to the handling of such conditions is varied. In some cases, the object of the practitioner is to hasten the correction of certain well-marked local manifestations of the disease with which the patient is afflicted. In other instances, the aim of the practitioner is toward the

prevention of these local manifestations. Occasionally, in a certain type of pathological conditions, the practitioner intends, by the use of topical iodine applications, to enhance the internal treatment being aimed at symptoms whose entire nature is local in character and confined to a very limited portion of the anatomy.

In every case coming under this subclassification, the effect that the iodine applications have—the only effect that they are able to accomplish—is one of amelioration; they can have no direct curative effect here. While the various conditions that are included under this head will be fully discussed in following chapters, I will point to the use of topical iodine medication in the handling of a case of parotitis as an illustration. While regional applications of iodine are the rule, in the handling of cases of this affection in veterinary

patients, no one at all versed in the condition as it occurs in practice would give the credit of ultimate cure to the iodine applications. But all will admit readily that, while the internal treatment indicated by the pathology of the condition is correcting the lesion *per se*, the regional applications of iodine do contribute materially to a smooth termination of the case in that they do, without question, lessen the possibility of abscess formation, relieve the pain, and hasten resolution.

The conditions included under this heading form, in great part, that class of cases to which reference was made in the beginning of this treatise, namely, those in which iodine treatment is largely used under circumstances and in conditions that lack almost every scientific indication for its application. Yet, it is in these very conditions, and under these very circumstances, that

topical applications of iodine are frequently most salutary in effect. And this effect is enhanced to the degree, as will be pointed out later, to which the practitioner becomes adept in the selection of the proper form or preparation of iodine for the particular case in hand.

3. REGIONAL IODINE APPLICATIONS FOR THE CURE OF CHRONIC PATHOLOGICAL CONDITIONS.

It is in the correction of chronic pathological conditions, that iodine therapy finds its greatest field in the practice of veterinary medicine and surgery. It is in chronic pathological conditions, that iodine, in various forms, and with various modes of application, so forcibly demonstrates its therapeutic work, for it is here that iodine is often the only agent used in the

handling of the case, thus constituting the entire treatment. Under these circumstances, it is never a difficult matter to decide as to the value of the treatment or the activity of the agent used.

Were there no other means of demonstrating the fact that iodine, in some of its forms, arouses the animal organism to the end, and in the direction, of marked efforts at regional cure of various pathological states, we would have evidence of ample weight to convince us of this in the results that we daily get with its application in a general practice.

There is hardly any therapeutic result from which the practising veterinarian derives more professional satisfaction than he does from the sure, gradual effect of properly selected and correctly applied iodine preparations in chronic pathological conditions of the articulations, from the speedy and

specific effect of others in certain skin diseases, and from the almost miraculous cure of certain localized infections when the proper iodine medication is applied in these.

So sure are the effects of iodine, in a curative way, in certain diseased conditions among domestic animals, that it has value in this regard from a diagnostic standpoint. Given a case apparently of this type for handling, the practitioner can be assured that he has erred in his diagnosis if iodine, in proper preparation and correct application, does not effect a cure. To illustrate this, I need only refer to that diseased condition of the skin commonly termed "ring worm."

It is nothing unusual, in a veterinary practice, to see the curative effects of iodine applications demonstrated in certain chronic conditions, of the articulations for instance, after various other

means of handling, even including surgical interference, had failed to effect the desired result. In not a few of such conditions, iodine applications, in some form, are prescribed as a sort of "last resort" treatment, even against the hopes of either client or practitioner, for the accomplishment of anything in the way of benefit.

Almost any practitioner of veterinary medicine, with whom you may care to discuss the matter, can point to case after case, in his own practice, in which a spavin, or a ring-bone, that had been cauterized or otherwise operated upon with failure, had yielded to a course of topical iodine applications. In some instances, a cure of this sort causes a practitioner to lose faith in operative measures for the correction of the conditions in question. Usually, however, it impresses upon him, with added force, the thought that he has not fully

acquired the knack—either along practical or scientific lines—to select his cases properly. Could he be sure that a given case would yield to applications of iodine preparations, he would much prefer to treat it that way; but he is not often sure. He has learned that there are certain cases, although to all appearances, as far as he is able to tell, not differing from other cases of the same nature, will yield to actual cauterization; he has learned, also, that certain cases will yield to local applications of certain iodine preparations. But he finds it difficult to select these cases for the respective forms of treatment in the general run of his practice. That he may be better able to serve his clients, and that he may even more highly appreciate the therapeutic worth of iodine in some of its forms of preparation, I have made some clinical observations, in my own practice, which I shall record

in the following chapters, and which, I believe, will help to solve this problem for him. While it is not possible to pick out every case in which iodine applications will give the desired result, it is not an exceptionally difficult matter to select the great majority. It is the opinion of most veterinary practitioners, who have the ethics of their profession at heart, that the treatment of certain well-known pathological conditions of the articulations, by means of the actual cautery, is one of the most disagreeable features of a veterinary practice. It is one of the things that most veterinary practitioners are trying to get away from; it smacks more of quackery and dark-aged farriery than anything else that the veterinarian is obliged to do. When, on top of this, we view this form of treatment from the angle of the humanitarian, we fail to understand why otherwise able and

enlightened practitioners will resort to it under any conditions. True, there are apparently a few forms—a very few—of equine lameness that will yield to no other form of treatment. Note, I have said *apparently* there are some. I believe, in fact, that any case of lameness located in an articulation is curable, *if it is curable at all*, by means other than burning the area with a red-hot iron. While most of us, in practice, do fire cases of articulation lameness, I believe that we do so for the reason that frequently it is *for us* the easiest way to terminate the conditions connected with the case. And I further believe that every time we resort to the actual cautery, for the correction of a lameness in an articulation, we admit, in the fact that we do so resort, that we do not fully understand the condition we are attempting to cure.

This belief is the result of actual contact with ample clinical material and the observations made in actual practice covering a period of time extending over more than fifteen years.

Other chronic pathological conditions, in which iodine applications are frequently serviceable, are various new-growths in the integument, underlying tissues, and in the glandular tissue near the body surface. It is often possible to accomplish, with topical iodine applications, results in these conditions which could only be equalled by surgical interference of much more costly and dangerous character. Iodine applications are at times resorted to in such conditions as these, to obviate the scar formation that might result from a surgical operation. At other times, resort is had to iodine on account of such objections to surgical interference

as cost, danger to the patient's life, protracted period of convalescence, or other equally reasonable objections.

In the effects that are obtained from the local applications of iodine preparations, in chronic pathological conditions, these preparations act not only in a palliative or ameliorative sense, but literally in a curative manner. They accomplish, in these conditions, solely and wholly through their own activity, the removal of the condition and the correction of the respective abnormalities. While, in some of the conditions under discussion, the desired result is attained only after very prolonged treatment with iodine, the condition is usually of such a character that neither the owner of the animal nor the attending veterinarian is averse to lending the time consumed. In other of these conditions, the desired result comes very promptly, at times with a

rapidity that causes astonishment. In all cases yielding to topical iodine therapy, sufficient evidence of the beneficial effect derived is discernible with sufficient promptness to encourage the continuance of the treatment.

IV.

The Selection of Iodine Preparations for Practical Use.

Next in importance to the proper selection of cases amenable to topical iodine application, is the selection of the particular preparation of iodine to be applied. As I have already pointed out, in the chapter on the general consideration of local iodine therapy, what may be an indication for the use of iodine in one form may lack the requisite pathological status for its successful application in another.

While the effect that the various preparations produce probably does not vary to a great extent, the ability to exert this effect does vary in the different preparations. Because of certain physical properties with which the vehicle carrying the iodine is en-

dowed, certain preparations of iodine are more active in a given condition than others. Others, again, hold the iodine in such a manner that it is more readily available for the needs of the case under treatment, while yet another preparation may hold, within its pharmaceutical dress, greater quantities of available iodine than one very closely allied to it in every other regard.

Then, too, it is not always the particular form or preparation that influences the effect; frequently this influence is, for the most part, in the pathological condition itself. Without going into the details of what must be especially considered in the selection of the preparation to be used in a given pathological condition, I have here set down the observations that I have made, in my own practice, and which my experience with this branch of vet-

erinary practice has indicated to me as being as nearly correct as could be expected in a practical way.

TINCTURE OF IODINE.

Skin disinfection in Surgery.

Skin disinfection previous to hypodermic injections.

Adjunctive to systemic medication in the treatment of generalized infections with local manifestations, such as septicemia, actinomycosis, acute glandular swellings as a complication to fevers, parotitis, and distemper.

First aid application for sprains of ligaments, tendons, and bursae.

First aid application in puncture wounds, and wounds in the region of the hoof, articulations, and bone bruises and contusions.

Injection into abscess cavities after the liberation of their contents by surgical means.

Moist parasitic skin diseases.

As an adjunctive in all conditions of an acute character in which it is desired to enhance the action of systemic medication aimed at the correction of local manifestations.

For the rapid absorption of acute swellings, such as sternal cysts, cysts in the fleshy parts from kicks or bruises.

As an injection into the synovial sack of enlarged bursae, after the contents have been drawn off.

OINTMENT OF IODINE.

Chronic enlargements of the articulations.

Chronic enlargements of osseous structures.

Chronic tumefactions resulting from specific infection.

Chronic thickening of tendons.

Chronic thickening of ligaments.

Chronic thickening of localized areas
in the skin.

Inoperable superficial tumors, when
non-septic.

Tumefactions accompanying chronic
degenerative processes, such as
fistulae, deep sinuses, and ulcers.

For the absorption of old scar tissue.

As a hoof dressing.

Parasitic skin diseases.

Herpes tonsurans.

As a packing for abscess cavities,
fistulae and sinuses.

Mammitis.

Orchitis.

Chronic arthritis, spavin, ringbone.

Side-bone lameness.

Removal of splints, curb, buck shin.

Goiter.

Ointments of iodine are especially
serviceable in all conditions in which
it is desired to obtain the remote ef-

fects of topical iodine medication, and in which the effect desired is a gradual, intensive saturation of the parts treated with the iodine. In choosing an iodine ointment for this use, the veterinarian should select a preparation in which the iodine exists free and uncombined with other agents, in a vehicle that is blandly penetrating and non-irritating. I can highly recommend Iodex, as fulfilling exactly these requirements. It can be applied freely and indefinitely, and, even when the course of treatment is exceptionally prolonged, the parts to which it is being applied show no sign of being irritated. With other preparations, it is often necessary to discontinue the applications for a time because of the local irritating effect. This delays not only the ultimate recovery of the patient, but may even result in the cure being only partly satisfactory. In addition to its non-irritating properties, Iodex is much more active than any other ointment preparation of

iodine with which I am acquainted, and it has the remarkably noteworthy property of leaving no stains. Although the ointment is a rich blue-black in appearance, it may be applied to the treated area with the bare hand, and will not stain the fingers. This is a quality not possessed by any other *active* iodine ointment to my knowledge. Iodex can be obtained from all large wholesale drug houses and distributors of veterinary supplies. It is a Menley & James product. Should the veterinarian have difficulty in obtaining Iodex from his regular supply house, I would advise him, rather than accept a substitute, to obtain it from them direct, by writing to their New York Office at No. 168 Duane Street. I have used many iodine preparations in my practice during the past fifteen years, and have found in Iodex the ideal veterinary iodine ointment because, as I have already pointed out, the iodine in it appears to be in a free state, uncombined with detract-

ing agents, it is blandly penetrating and, therefore, will positively not irritate the most tender animal skin, and it does not stain the hands with which it is applied.

Comparing its properties and its marked activity with that of other iodine ointments, it is by far the most economical for the veterinarian to use.

Iodex is one of those preparations, so rare, that the veterinarian soon learns to appreciate highly and without which he finds it difficult to conduct his practice, once he has made its acquaintance. He finds that there are so many conditions in which it is the only pharmaceutical article that exactly fills all the therapeutic requirements, and he is able to obtain with it results that he did not think possible before he made its acquaintance. Iodex exceeds in activity the other iodine preparations to the same extent that an autogenous bacterin exceeds in specificity that of a stock bacterin, and I would

advise that every practitioner of veterinary medicine who has not yet made its acquaintance write at once to Menley & James, No. 168 Duane Street, New York City, for a trial package. I make this recommendation with a full realization of the fact that Iodex is a proprietary agent, and the veterinarian will, in the light of my numerous contributions to ethical veterinary literature, correctly infer that Iodex must indeed be an agent of more than ordinary merit.

OILY SOLUTIONS OR MIXTURES OF IODINE

Sub-acute and chronic skin lesions.

Acute, dry skin diseases.

For injection into synovial bursae when the tincture of iodine is contra-indicated.

To anoint arms and hands in the handling of obstetrical cases.

For direct application to mucous membranes.

Ringworm.

As a moist dressing for wounds of long standing.

Garget.

Dry, scaly affections of hoofs and of the legs of poultry.

Open joint.

Injection for puncture wounds.

All chronic surface conditions in which the use of iodine ointments would not be practicable.

AQUEOUS PREPARATIONS OF IODINE.

Although, from a chemical standpoint, the mixture of tincture of iodine with water would be considered wrong, I have found that the addition of one dram of tincture of iodine to a quart of sterile water makes a most satisfactory combination for use in veterinary practice for a number of diseased conditions.

In mal-odorous catarrhal diseases, a mixture such as this makes a fine wash.

In the treatment of foul-smelling ulcers and fistulous tracts, it should be used with an irrigator after the parts have been cleaned up and just before the usual dressing is applied.

To stimulate the process of healing in wounds and lacerations such as barbed-wire cuts and tears.

As a moist dressing applied on gauze in old wounds.

As a soaking solution for foul-smelling hoof troubles.

As a wash for the veterinarian's hands and arms, to prevent infection and remove odors, after the handling of after-births, dead fetuses, and other conditions of a similar nature.

When this preparation is used at all, it should be applied liberally; it is cheap and the cost need never be considered. It is additionally valuable, in a veterinary practice, because it can be made up extemporaneously

anywhere that water can be obtained, as all veterinarians carry, in their medicine case, a supply of tincture of iodine.

The strength may be increased if desired; however, I have found the proportions, as given above, the most satisfactory.

In my experience, I have found that I can do everything that it is possible to do with iodine preparations by using the medicaments already indicated.

However, I would draw the practitioner's attention to that preparation of iodine known as Lugol's solution, because there is one condition that the veterinary practitioner comes into contact with quite frequently in which this iodine preparation has been found to give some very good results.

Lugol's solution of iodine has been found to act, in a very favorable manner, in certain cases of periodic ophthal-

mia in horses. It is injected hypodermically in the region of the fatty pad just over the affected eye. While this is not truly a topical application, the effect that is exerted is the same as that resulting from repeated inunctions of other active iodine preparations. The use of Lugol's solution, in this manner, is only to be preferred because it accomplishes the desired end more rapidly, and with less expense of time, than would be required by topical applications, frequently repeated. I do not doubt that just as good and lasting results could be obtained, in this condition, from daily inunction of the indicated area with an oily iodine preparation.

It remains to be said that, in this condition, internal medication is usually indicated and the iodine, in any form, applied regionally, merely acts adjunctively in any case. I have made men-

tion of this use of iodine preparations because some practitioners treat periodic ophthalmia in this manner and have claimed good results repeatedly.

Before I proceed to the discussion of the special application of iodine, in a number of pathological conditions in animals, I would urge the veterinarian to give more thought to the forms and preparations of iodine of which he makes use. It is a rather common occurrence that a practitioner will allow agents of well-known therapeutic efficiency to be displaced, by others of doubtful activity, on account of a small difference in the cost of the same. This is especially true in the case of preparations in which the active ingredient, and, therefore, the ingredient to be depended upon for results, is iodine. Iodine, to begin with, as an elemental article, is costly. The veterinarian may, therefore, be sure that, whenever an

iodine preparation, of a certain stated strength, is offered for sale at a price considerably lower than that of recognized preparations of a similar character, the lower price is possible only because of the fact that the iodine content is not as represented.

In choosing preparations of iodine, for use in his practice, the veterinarian can easily deprive himself of much of the success that goes with correct iodine therapy, if he allows his choice of preparations to be influenced, to any great extent, by the cost of the article.

This is the chief reason, and there is probably no other, why some veterinarians fail to get satisfactory results from topical iodine applications. They permit their better judgment, in the selection of the preparations, to be influenced too markedly by price; the preparation that they select fails to give the expected results because it is an

inferior preparation, either in the strength or the quality of the iodine it is said to carry. Commonly, both strength and quality are inferior.

Well made and honestly prepared iodine preparations are cheaper than almost anything that the veterinarian uses, in a pharmaceutical way; a little of a good iodine preparation "goes a long way"; and it accomplishes what it does solely through the exertion of its own energy. Almost never, it might be said, are other agents expected to assist it in its action. For this reason, it is very essential that the preparation be of correct and ample strength, that it contain the iodine in a form readily available by the tissues, and that the vehicle carrying the iodine have no detrimental action of its own.

There is still another point that I wish to bring out, and that is in regard to the fee that the practitioner charges

for the handling of a case with more or less costly iodine preparations. Usually, his fee is too low. The practitioner should consider the fact that, in not a few of the cases in which he uses topical iodine treatment, he is actually depriving himself of a surgical fee, and the charge that he makes for the treatment, in place of the operation that would otherwise be required, should, in some degree at least, offset the loss thus apparent. In some cases, it is even possible to get a larger fee under these conditions, for, frequently, the owner of an animal would much prefer that a given condition be cured without a surgical operation, and would offer no serious objection to a higher fee for the correction of the condition by a prolonged course of topical iodine medication. In the case of a valuable animal, where scar formation might depreciate the value, the smooth results,

that are not uncommonly attained with iodine preparations, actually deserve to be rated as much more agreeable, and, therefore, worth a larger fee, than a surgical operation.

Whenever resort is had, by the veterinarian, to applications of iodine, in considerable amounts, he should not hesitate to inform the client that the agent used is costly, and that a special charge will be made therefor.

Many veterinary practitioners have come into the habit of writing prescriptions for all iodine preparations that they find it necessary to use, while all other medicines they dispense out of their own pharmacy. I do not consider this good practice, for several reasons. The main fault that I find in this is the one making it possible for the client to have the prescription refilled without consulting the veterinarian. It is nothing unusual for a prescription to be

given to neighbors or relatives, thus depriving the veterinarian of his fee. Another reason that I have for finding fault with this practice, is that many druggists will not fill a veterinary prescription honestly; seeing that it is "only for a horse" or a cow, they do not hesitate to use drugs, in compounding the prescription, that they would not think of putting into a prescription for a human being—old drugs, drugs of inferior quality, and the like. For these, as well as other equally important reasons, the veterinarian should dispense all iodine preparations, just as he does all others. He should not be deterred, from using these preparations, on account of the slightly higher price which he must pay for them, if he makes it a point to impress the worth of the article on his client, and charges the fee that he should.

V.

Method of Using Regional Iodine Therapy in the Correction of Various Pathological Conditions.

If the reader has made an effort to follow me in what I have said in the foregoing chapters of this treatise, he will have no difficulty in applying, to cases occurring in his practice, many of the suggestions offered.

In this, the closing chapter of the treatise on regional iodine therapy, I intend to refer to a small number of conditions, in the handling of which I have found great satisfaction in the use of the preparations heretofore mentioned, and, at the same time, I shall endeavor to explain my own particular methods of using the preparations.

I have already disposed of the manner in which the applications of tincture of iodine are made, previous to incision

of the integument, in surgical operations. Aside from this quite common use of this preparation, I have found tincture of iodine of great worth as an application to calk wounds in the coronary region of the equine foot. When the injured horn has been pared away under the wound in the coronary band, and the loose particles of flesh and hair cleaned away, the wound is freely painted with pure tincture of iodine. This painting is to be repeated several times daily, until recovery takes place. Severe infections rarely occur if the applications are begun within a few hours after the accident occurs.

Whenever tincture of iodine is used, for the correction of an abnormality in the horse and cow, it must be applied very liberally if the effect is desired with any degree of promptness. This, together with the fact that the tincture is quite irritating to the skin

of animals—a fact that precludes an extensive course of treatment with this preparation—makes iodine, in this form, an agent that is chiefly of use in acute conditions, and it is, therefore, the agent of choice to act as an adjunctive treatment to the internal handling of such conditions as septicemia, strangles, distemper, parotitis, lymphangitis of a localized character, and acute inflammations in tendons, ligaments, and synovial bursae. In any of these conditions, it is best applied with a small, rather stiff brush, painting it liberally, over the parts involved, several times daily. If the parts become very much irritated from these applications, the treatment must be stopped and the area treated with a coating of vaseline or lard.

The oily preparations of iodine are especially useful in various skin diseases, ring-worm, and the parasitic

form of scratches in horses. The secret, in the successful handling of these conditions with oily preparations of iodine, lies in the abstinence from water; the parts should be given one thorough washing, when treatment is first begun, after which no more water should be applied. If the parts need cleansing, while the course of treatment is under way, it should be done in a dry manner, with clean cloths or cotton wads.

Oily preparations of iodine may also be used to anoint the arms of the surgeon during the handling of infected cases of obstetrics. Pouring a quantity of the preparation into the palm of the hand, and then rubbing it gently over the skin of both hands and arms, proves a reliable barrier to infection from a decomposed fetus or after-birth.

In applying the oily preparations of iodine, to lesions on the integument, it is always necessary to massage them

into the tissues quite vigorously; when this is done a single application each day suffices.

Other indications for the oily preparations, as well as for aqueous preparations, of iodine, have been pointed out in the chapter devoted to the selection of iodine preparations for practical use.

Ointments of iodine—which, for me, mean Iodex—have, by far, the most extensive field of application, and the uses to which an iodine ointment may be put have already been quite clearly indicated. I will, however, remark some of the points to be considered in using Iodex in such cases as spavin lameness and similar affections of the articulations.

In choosing, for treatment with Iodex, a case of spavin lameness, the practitioner should select only those cases in

which the horse warms out of the lameness; these cases can positively be cured by Iodex applications. Do not attempt to cure the lameness caused by spavin in which the horse will not warm out of the lameness; these cases are not only impossible of cure by this means but by other means, excepting neurectomy, as well.

When the case has been selected, the Iodex should be applied, not only in the immediate vicinity of the exostosis, but entirely around the hock involved. An application should be made every morning and every evening, in the following manner: Apply a thin coating of Iodex and massage it into the hock for at least five minutes; then apply another very thin coating, allowing this to remain on the surface. The applications must extend over a period of from five to seven weeks—about such a length of time as is required to effect

a cure with actual cautery—and, during the first few weeks of this period, the animal should be at rest. After the second week, it may indulge in light exercise in a lot or paddock, but may not be worked.

Cases of spavin, treated in this manner—cases selected for treatment as above outlined—are not only cured of lameness, but, in many cases, the enlargement also disappears.

The same results are obtained in cases of lameness from ringbone, sidebone, splint and curb.

Buck shins can be entirely absorbed with applications of Iodex as directed above.

Other conditions, in which the effects of Iodex frequently are most remarkably satisfactory, are goitre, fibrous tumors on the body surface, hygroma,

and tendonous and ligamentous enlargements.

The applications, in these conditions, are made in a manner similar to that in spavin, massaging the Iodex thoroughly into the parts involved.

In bringing this treatise to an end, I would again urge the practitioner to add Iodex to his therapeutic armament, and use it not only in the conditions of which I have here made mention, but in many other indications for iodine therapy which come up almost daily in every veterinary practice.



