

**A PRACTICAL TREATISE ON URIC ACID
TOXEMIA IN ALL ITS PHASES:
INCLUDING ITS
TREATMENT WITH THIALION, A
LAXATIVE SALT OF LITHIA, WITH
COMPLETE BIBLIOGRAPHY AND INDEX**

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A Practical Treatise on Uric Acid Toxemia in All Its Phases: Including Its Treatment with Thialion, a Laxative Salt of Lithia, with Complete Bibliography and Index by Vass Chemical Company

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A Practical Treatise

ON

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URIC ACID TOXEMIA

In All Its Phases, Including Its Treatment With

THIALION

(A Laxative Salt of Lithia.)

With a Complete Bibliography
and Index.

FIFTEENTH EDITION.

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INTRODUCTION.

As may be observed, the present edition of this brochure differs from those preceding it in several particulars, to the following of which we may direct attention as being the most important changes; to wit:



Owing to the constantly increasing amount of clinical material received from time to time, the booklet has been growing in bulk until it has reached a point in size, to exceed which would render it too cumbersome for practical use. It has been deemed advisable, therefore, to shorten the articles, wherever possible, by presenting them in the form of abstracts: rejecting the immaterial, but retaining the material part in each instance. Some of the more important articles are still left in their entirety, in the form of reprints. In both of these forms, however, due credit is given to the journal in which the article originally appeared, together with the date of publication and the name and address of the author. A few of the older articles have been stricken out entirely and several new ones added.

The descriptive portion of the pamphlet has been re-edited in part, to keep pace with the accumulating evidence concerning the therapeutic action of thialion, as shown by an additional two-years' experience in its employment. The tabulated "references" to reprints of articles, heretofore appended to their respective sections, have been omitted here; but may be found alphabetically arranged in the index.

In lieu of the "table of contents," which appeared on the inside covers of previous editions, an index of authors' names has been prepared for the present edition, as well as a new and complete index of subjects and titles, which will enable the physician to find any given topic with greater facility.



THIALION

A Laxative Salt of Lithia.

PHYSICAL PROPERTIES.—Thialion is a granular salt, of a lightish brown or straw color, sometimes varying in shade to a somewhat darker hue. It is non-hygroscopic, non-deliquescent, markedly diffusible and invariably of a definite and uniform strength. It does not spoil in any climate; i. e., it never deteriorates.

It does not effervesce.

It is agreeable to the stomach, and it is not unpleasant to the taste, though very slightly flat.

It is only partially soluble in cold water, but freely so in hot water, imparting to the solution a faint yellowish-brown tinge. It should always be dissolved in hot water, and drunk at the highest temperature that can be borne comfortably. Taken in this way, it is quickly and completely absorbed into the circulation—an effect which is of inestimable therapeutic advantage, and one which we believe cannot be obtained from lithia administered in any other form.

Thialion has never been patented; and only the *name* is made proprietary. The details of its manufacture (i. e., the exact process) have never been made public for obvious reasons. And yet, in this respect, the physician probably knows as much, or as little, as he does concerning the manufacture of many other salts in common use—e. g., as he does of sulphate of quinine or of morphine.

CHEMICAL NATURE.—Thialion may be described from the chemist's standpoint as a complex salt, formed by the union of sulphuric and citric radicals with sodium and lithium bases. In the process of manufacture, decomposition of the chemical agents employed and rearrangement of the various molecules take place, forming new combinations.

In the preparation of any alkaline salt on a large scale, it is the custom to part the various products; but, in making thialion, the lithium base is not removed from among the secondary combinations but is left in combination with one of the residual products, and a new laxative salt containing lithium and sodium is produced. It follows from the method of manufacture that thialion is not a preparation composed of distinct ingredients in the sense of a prescription formula, as is Dover's powder for instance; that is to say, it is not the pharmaceutical mixture of so much of a prescribed sodium salt with so much of a given lithium salt, but the sodium and lithium bases are in such relation that vital action is required to part them. Hence, in thialion, we find a remedy the effects of which are *sui generis*, or at least far removed from those obtained by prescribing any *mixture* of sodium and lithium salts.

In hot aqueous solution this salt forms an artificial *alkaline mineral water* of marked potency and unusual solvent properties. In this form, though not chemically incompatible with other remedies which would naturally be thought of as adjuvants, yet it should usually be prescribed **ALONE**, an hour or more before other drugs. This is especially true of iron, though bismuth or cerium oxalate may be taken immediately in those cases where the ingestion of hot liquids is illy-borne.

By dissolving a mixture of the sulphate and citrates of sodium and lithium in a glassful of hot water, and swallowing the nauseous mess, the wide difference between a mechanical mixture of these salts and their combination in the form of thialion, will at once be fully appreciated.

CHEMICAL ACTION.—Though, naturally, much of the interest taken in thialion relates to its chemical composition—i. e., a very proper curiosity being felt concerning the nature of the dry salt, itself—yet, all this fades to nothing in comparison to the interest we cannot but have, as to what takes place within the body.

We may consider, if we see fit, that the sulphuric radical is made the mate to both sodium and lithium, so far as both are present in the needed proportion; for, while the larger part of the sulphate of soda is excreted, or, better, emptied from the bowel as such, some must have been absorbed, since a portion is discharged as sodium hydrogen sulphide or as sodium sulphide. This can only be explained by assuming a previous absorption. Further, we know, that, as the lithium is at least in large measure discharged by the kidneys, it must have passed into the blood-stream; which passage it is not likely to make as lithium citrate, but which it can easily make as a sodium-lithium sulphate. It is very properly doubted if the sodium salt formed by the sulphuric acid is a neutral salt at the beginning, since more probably an acid salt is the first member (not Na_2SO_4 but HNaSO_4), and in this case the sodium-lithium sulphate can be assumed, in which form the lithium would be absorbed with comparative ease. The citric acid may then be supposed to unite with the sodium to form sodium citrate which is very readily absorbed.

The diuretic action upon the kidneys will then be two-fold, the lithium (a base) uniting with the uric acid, while the citric radical, broken to carbonic acid, will unite with any base demanding elimination and will remove it. Under circumstances such as these, the observed usefulness of thialion is simply a necessity.

NAME.—As the descriptive naming of this double salt was found to require a technical term much too cumbersome for practical use, the name "thialion" was coined as being suitable. The latter, as may be seen, is derived from the word "lithia," the letters of which have been transposed and the syllable, "on," added for the sake of euphony. The word is pronounced, "THI-AL-I-ON," with accent on the second syllable—the "a" being sounded as in "man."

PRESERVATIVE QUALITIES.—It is not essential that the salt should be kept in a colored or blue glass bottle, although the chemical action of actinic rays of light would probably be less operative in such a case. Thialion may be kept in transparent glass bottles or in an ordinary wooden box, without any apparent loss of strength even though exposed to air and light for several months. Samples of this kind have been preserved at the factory for nearly eight years, with no deleterious effects as proven by frequent tests. The only change noted is a faint alteration in the color of the salt, which becomes slightly darker after prolonged exposure to sunlight. Its physiological action, however, remains unchanged. Being an anhydrous granular salt (without "water of crystallization"), the physical change produced upon thialion, by exposure, is practically nil, even when exposed to dampness. We believe, however, that in order to eliminate every possible element of risk, the salt may be preserved to the best advantage in its original package.

WHY HOT WATER.—Practical experience has conclusively demonstrated that the best method of administering thialion is as follows; to wit:

1. Dissolve thoroughly a teaspoonful of the salt in half a glassful of hot water.

2. Add sufficient cold water to reduce the temperature of the liquid to the just drinkable point—then drink the whole at once.

It is probable that the therapeutic value of the older diuretics was due as much to the caloric effect of the hot infusions used as to the physiological action of the simple remedies themselves. The osmotic and solvent effect of heat is best exhibited in the warm bath, where the imbibition or absorption of water takes place.

Much more is implied in this last statement than may at first sight appear. To begin with, it should be remembered, that, as the temperature of any liquid containing crystalloids is raised, not only is the rate of diffusion of the latter increased, but their passage by osmosis into an adjoining colloidal solution is accelerated. In other words, salts in watery solution will pass through animal membrane into the colloidal blood more rapidly and more completely if the temperature of the solution is equal to, or greater than that of the blood. It is for this reason that hot alkaline baths (104° F.) are given in gout and rheumatism. The success of the method of treatment observed at the Hot Springs is dependent upon the same dynamic law; i. e., the lithia, soda, etc., contained in these waters, are more readily absorbed into the system. If the body were simply to be immersed in cold water, very little of these salts would be taken up through the skin. The same lack of results necessarily obtains when cold lithia water is taken into the stomach. It will be seen, therefore, that in ordering the patient to dissolve thialion in hot water, and to drink it before becoming lukewarm or cold, an important principle of molecular physics is involved upon which is insured the thorough absorption of this remedy into the circulation.

PHYSIOLOGIC ACTION.

CIRCULATION.—Like certain other alkaline medicinal agents (as K. I.), thialion reduces the viscosity and increases the alkalescence of the blood. This effect is produced both in health and in disease. Its most marked action upon the circulation, however, is observed when the blood is less alkaline than normal, due to an excessive quantity of waste tissue salts of the uric acid type. In such conditions, by giving thialion, the capillaries are freed from the urates which have previously impeded their flow, and the circulation of every organ and tissue of the body is correspondingly increased in volume and in purity; the result of which is not only to promote oxidation, but to indirectly stimulate the functional activity of the glandular organs. In this, it resembles somewhat the salts of potassium, but unlike them it never causes cardiac depression and hence is always perfectly safe from the therapeutic standpoint.

An explanation of the radical difference to be observed in the action of thialion as compared with that of the various lithia preparations on the market (e. g., tablets, salts, granular effervescent salts, mineral waters, etc.), may be given briefly as follows; to wit:

In the first place, it should be understood that lithia, as ordinarily prescribed in the form of the citrate or carbonate, is only partially absorbable as such, and in so small quantities as to be of little or no effectual service as a solvent of the urates. On the contrary, it is probable that the small amount of lithia thus absorbed into the circulation, is, as Haig believes, "at once waylaid by the phosphate of soda present, forming with it a nearly insoluble triple phosphate; thus, not only is little or no lithia left to combine with uric acid, but the latter is in a measure deprived of its natural solvent (the neutral phosphates), and is consequently thrown down as a deposit."

When thialion is administered, on the other hand, its alkaline constituent (soda) unites more readily than lithia with the soda salts of the circulation,

increasing them in amount (i. e., increasing the blood's alkalescence), while the lithia is left free to combine with the uric acid as in the test-tube. The well-known alkaline salts of soda and potash produce similar results, but to a much lesser degree. It will be seen, therefore, that while the citrate or carbonate of lithia, taken singly, partially cleanses the blood of uric acid by precipitating it into the bodily tissues, thialion removes it in solution by way of the kidneys, and, furthermore, by increasing the soda salts, produces the additional therapeutic effect of a cholagogue agent in stimulating the flow of bile and initiating peristaltic action of the bowels. Though the phosphate of soda resembles thialion in its cholagogue effects—preventing inspissation of the bile and crystallization of cholesterolin—yet it lacks the well-known solvent action of the lithia salt upon uric acid, and besides, tends to prevent the free elimination of urea,—as may be observed by any of the ordinary urea tests.

It has for some time been advocated by our best authorities that the natural mineral waters were too weak in their alkaline ingredients to ever become very effectual as uric solvents. It was over fifteen years ago, that the late Prof. Abraham Jacobi, of New York, in an article entitled "Therapeutics of Infancy and Childhood" (Published in *Archives of Pediatrics*, Jan., 1890), made the following significant statement:

"In cases of renal calculi (most of which consist of uric acid), particularly those cases which occur in gouty families, the diet should be limited to but a moderate quantity of strongly nitrogenous food. The patient must be encouraged to drink much water, alkaline waters to be preferred. The natural lithia waters (though the best) contain less than the occasion calls for, thus those which are *artificially* prepared have the advantage over those prepared by nature."

It will at once be seen that when thialion is properly taken according to the directions—i. e., dissolved in a glassful of hot water—an artificial alkaline lithia water will be administered which fulfils the indications not met by natural waters, as described by Jacobi, and it is, doubtless, partly for this reason that the results of treatment in these cases have proven so much more satisfactory to those physicians who have tried both methods.

NERVOUS SYSTEM.—Thialion increases the assimilation and metamorphosis of proteid and purin materials, favoring the elimination of uric acid and urea, and hence by freeing the system from the acid promotes a more energetic cellular action and influences indirectly the nervous system, improving the general muscular tone and stimulating the nerves, thus producing buoyancy and cheerfulness, where, hitherto, had existed depression, listlessness and general debility. The theory is now well established that headache, depression, fits of "blues," and various other functional disturbances are often due to the presence of an excess of uric acid in its colloid form obstructing the cerebral capillaries.

To show the difference between the action of thialion in these cases and that temporarily produced by administering some chemical agent which *decreases* the alkalinity of the blood forming insoluble urates and driving them into the connective tissues and joints, *causing rheumatism*,—the following clinical test which was recently given by us, will prove most interesting and instructive:

Mrs. G., *æt.* 50, suffered from frequent attacks of the "blues" and "sick headaches," and complained of lassitude, mental confusion, loss of memory, lack of ambition, irritability, cold extremities, etc., As her urine was characteristic of the lithæmic condition, we attributed the foregoing symptoms to an excess of uric acid and its congeners in the circulation. As an experiment, thirty drops of acid phosphate were administered in a half glassful of cold water, *t. i. d.*, for a fortnight. Before the end of the first week, however, the patient reported "decided improvement." The headaches disappeared, and mental brilliancy

and a feeling of exhilaration followed. The urinary water increased greatly in quantity, was paler in color, but contained much *less* of the urates than formerly. It was evident that the capillary circulation was freer—that it was unimpeded by the presence of uric acid in excess; but that this excess had not exhibited itself in the urine. Where was it?

Early in the second week this question was answered. The patient now began to complain of pains in the muscles of the side, neck and back, and exhibited some tenderness in one carpal and two metatarsal joints. Before the end of our fortnight's experiment, she was confined to her bed with a severe attack of lumbago and torticollis, and threatened with articular rheumatism in at least three joints. The acid remedy was now withheld, a colored placebo administered—and *nothing else*. Within forty-eight hours the rheumatic attack had subsided, the urine again became scanty, high-colored, containing some urates, and the headache with its disagreeable accompaniments returned with increased virulence. This condition of affairs was permitted to exist for a week, the patient fully recognizing that she was back again in the old rut. It was then that we prescribed an *alkaline* uric solvent (thialion); a teaspoonful being given in a glassful of hot water every second hour the first day, until four doses had been taken. The second and third days, a teaspoonful was given an hour before each meal, after which one dose was given daily, immediately upon arising. The result was as expected. The headaches vanished in a day or two, the same mental exhilaration was experienced as in the previous instance, but, *in addition*, the urine became loaded with urates. The treatment was continued in this way, for a fortnight, the urine being kept slightly on the alkaline side of the neutral point; and to-day the patient is enjoying comparatively good health.

Now what is the explanation from the uric acid standpoint? We contend that the patient was suffering originally from migraine, due to uric acid excess in the circulation. The "acid phosphate" which we administered, reduced the alkalescence of the blood formed insoluble urates, or at least, caused their deposition in certain muscles and joints, thus initiating an attack of rheumatism, but freeing the capillaries and effecting relief from the headaches, etc. By withholding this acid remedy, the blood speedily regained its normal alkalinity the urates were reabsorbed into the circulation, relieving the rheumatism, but reproducing the headaches. Lastly, the alkaline solvent thialion, when finally administered, not only freed the capillaries from their obstruction, and thus relieved the headaches, but avoided the rheumatic symptoms and effected a permanent cure by eliminating the toxin from the system entirely—as was demonstrated by its appearance for a few days in greatly increased amount in the urine. *Uric Acid Monthly*, Vol. 1, No. 4, April, 1901.

LIVER AND BOWELS.—One of the most valuable features, concerning the physiologic action of thialion, is that of its power in aiding or stimulating the hepatic function. It is in no sense a cathartic. It is a *laxative*. It does not whip the bowels into action, it simply aids them in the natural performance of the process by enhancing the biliary flow, increasing peristalsis, and rendering the passages more soluble. It cleans out the clogged up liver cells, and at first gives rise to alvine dejections of an exceedingly malodorous character. The stools are usually well formed, but of a soft "mushy" consistence. Four or five doses, repeated every hour or two, will produce a mild catharsis, but with none of the debilitating after effects so common to the class of remedies called "salts;" neither does it produce tenesmus nor favor a chronic torpidity of the bowels.

Owing to its solvent action upon the urates and the consequent removal of amido-acids from the circulation (together with the additional salt of sodium furnished), thialion serves to increase the fluidity of the bile and to neutralize the biliary acids (taurocholate and glycocholate of sodium), thus proving of