

# NOMENCLATURE <sup>xx</sup>

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NOMENCLATURE AND  
TERMINOLOGY OF AL-  
KALOIDAL SALTS

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A SYMPOSIUM OF AUTHORITIES

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# NOMENCLATURE AND TERMINOL- OGY OF ALKALOIDAL SALTS

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A SYMPOSIUM OF AUTHORITIES

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WITH TABULAR SUMMARY BY S. W. WILLIAMS

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# NOMENCLATURE OF ALKALOIDAL SALTS—A SYMPOSIUM OF AUTHORITIES

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INVITED BY

S. W. Williams, Ph.C., F.C.S.

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**O**N the eve of a new British Pharmacopœia and nearing a revision of our own, it seemed to the writer a proper time for a careful consideration of the conflicting usages of Chemistry, Pharmacy, Medicine, and Commerce in regard to the naming of alkaloidal salts. He, therefore, sought the views of a number of the best authorities, and takes pleasure in submitting herewith the kind replies received.

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## ON THE PROPOSED CHANGE OF NOMEN- CLATURE OF ALKALOIDAL SALTS

[CHARLES RICE, Ph.D.—Chairman U. S. P. Committee of Revision]

The question of what ought to be the titles, in the Pharmacopœia, of certain chemicals that are used in medicine and that now bear names not entirely agreeing with modern chemical views, is still a subject of discussion and is liable to remain so until the appearance of the next Pharmacopœia, at which time it will be seen whether the next Committee of Revision will have become converted to the modern views or not. Among these chemicals there is one

group which is more especially under discussion, namely, the salts of alkaloids with hydrogen acids (hydracids), which, according to the old nomenclature, bear such names as "hydrochlorate," "hydrobromate," etc., while the disciples of modern chemistry claim that they should be called "hydrochloride," "hydrobromide," etc. It is proper and useful to keep this question alive, at least until its settlement by the next Committee of Revision. While the undersigned has already put himself on record regarding this question at a former occasion, he now recurs to it, feeling justified in making some concessions to the arguments since then advanced in favor of the change.

A series of interesting articles recently published by SEWARD W. WILLIAMS in MERCK'S REPORT (Jan. 1, Jan. 15, and Feb. 1, 1897), bears the title: "Should Pharmacy and Chemistry Speak the Same Language?" To this question, *regarded in the abstract*, an affirmative answer may be given without hesitation. The intelligent and educated pharmacist at the present time, particularly if he has had a college and laboratory training, will prefer to *speak* in terms identical with those used by the chemist. In his intercourse with the latter he will also *write* in such terms, in short, he will gladly *use*, in general, the same terms as the chemist, except where habit or some official injunction prevent him. If this question of uniformity of terms were one

to be settled only between the pharmacist and the chemist, an agreement could easily be reached. But it must be remembered that there is a third party to the action, with whom at least the pharmacist must reckon, and who has a voice in the matter. This third party is the physician, or, to define him for our present purpose more closely, the medical prescriber, who, as a rule, cares nothing for changes in official names, but keeps on writing his prescriptions in the terms which became familiar to him at the beginning of his practice. The wishes, preferences, or claims of this third party must not be entirely overlooked or overridden. Whatever agreements may be come to between the pharmacist and the chemist regarding the names of the medicines which the physician habitually prescribes, more particularly the names of those of long standing, they should not go so far as to create the risk of the prescriber's intentions being misunderstood. It is quite well for the pharmacist and the chemist to keep on moving ahead, but they should never so outstrip the physician, whose chief interests lie in other directions, as to disappear from his horizon altogether.

When a physician in our days wants to prescribe the "hydrochloride of quinine," he will, in nine cases out of ten probably, write: "Quin. Mur.," which is so much shorter than "Quin. Hydrochlor.," for the abbreviated form of the word "Hydro-

chloride" could not well be less than "Hydrochlor." without causing confusion. But, in view of the fact that probably *no* prescriber ever writes out such terms in full, and therefore never gets as far, with his pen, as the disputed end of the word, may this now be either "Hydrochloratis" or "Hydrochloridi" (gen.), and, further, since the proposed change in this particular group of compounds cannot well cause any confusion or danger, the undersigned is willing to accept them. But he cannot accept the dropping of the prefix "hydro" (which has been recommended by some), either in the Latin or the English *official* title, because "Morphinae Bromidum" and "Morphine Bromide" would need as much and probably more apology for their anomalous existence, as the term "Hydrochlorate" does now. As to the proposition to place an apostrophe before the word "Bromide" (thus: Morphine 'bromide), the undersigned appreciates the ingenuity of the device, but fails to see how this would save either time or trouble. For surely such an important sign, made visible to the eye (and *meaning* something), should also be made audible to the ear. And the undersigned cannot see how else the term could be pronounced than "Morphine apostrophe bromide." CHARLES RICE.



EFFORT TO BRING THE NOMENCLATURE  
OF THE BRITISH PHARMACOPŒIA  
INTO CONFORMITY WITH  
THAT OF THE CHEM-  
ICAL SOCIETY

[T. E. THORPE, LL.D., F.R.S.]

\* \* \* In the forthcoming edition of the British Pharmacopœia, a committee consisting of Professors TILDEN, EMERSON REYNOLDS, and myself, who were charged by the Medical Council to revise the chemical portion of the work, have strongly recommended—to use your own phrase—that Pharmacy and Chemistry should speak the same language; and with this view and to avoid confusion, we have sought to bring the nomenclature of the British Pharmacopœia into conformity with the system of the Chemical Society of London, which is being rapidly introduced into all modern English text-books on chemistry.

We have consistently used “hydrochloride” for “hydrochlorate.”

T. E. THORPE.

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**\*THE COMMA CONTRACTION APPROVED**  
[PROF. J. P. REMINGTON, PH.M., F.C.S.—Vice-  
Chairman U.S.P. Committee of Revision]

I think very well of your proposition to indicate hydracid salts of the alkaloids,

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\* The words “comma” and “apostrophe” are used throughout the discussion in the same sense. Nuttall’s definition of apostrophe is: “The contraction of a word by the omission of a letter or letters, which omission is marked by a comma. The comma so used is also called an apostrophe.”

when it is necessary to contract them, by replacing the prefix hydro with a comma. My position has not changed, and I very much prefer "hydrochloride" and "hydrobromide" to "hydrochlorate" and "hydrobromate;" but "hydrosulphate" is, unfortunately, suggestive. The comma obliterates this objection, and if adopted would soon cease to excite comment.

JOSEPH P. REMINGTON.

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**SAFETY, CLEARNESS, BREVITY, AND ACCURACY**

[WILLIAM MARTINDALE, F.C.S.—Author of  
"The Extra Pharmacopœia"]

The nomenclature of a pharmacopœia should be consistent with safety, clearness, brevity, and accuracy—it should not change otherwise. In English chemical language the term "hydrochloride" as applied to the well-known alkaloidal salts, morphine hydrochloride and cocaine hydrochloride, has now for a long time correctly replaced that of "hydrochlorate;" and pharmacopœias in English should now adopt the term *hydrochloride* for these salts.

Your idea of decapitating the prefix *hydro* and writing 'chloride is ingenious, and might be useful as a contraction.

There is no reason why affixes only should be deleted for contractions, so long as safety is guarded.

WILLIAM MARTINDALE.

## HYDROCHLORIDE AND HYDROSULPHATE

[ALFRED R. L. DOHME, Ph.D.—A.Ph. A. Committee of Revision]

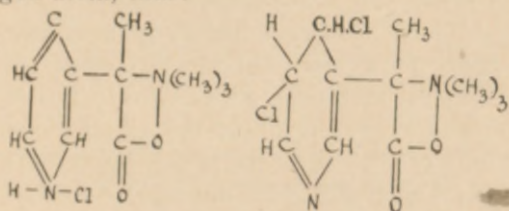
\* \* \* It is unfortunate that our chemical nomenclature is unsatisfactory in the matter of the halogen acids and oxyhalogen acids, the only distinction between HCl and HClO<sub>3</sub>, etc., being the prefix hydro, whereas an entirely different name should have been adopted. However, we must endeavor to make the best of what we have, and under the circumstances it is best to use the nomenclature that is least misleading, and this is "hydrochloride" for R. HCl, and "hydrochlorate," for R. HClO<sub>3</sub> ("R." representing the alkaloid molecule). To be consistent it is then, of course, necessary to adopt "hydrosulphate" for R. H<sub>2</sub>SO<sub>4</sub>, "hydronitrate" for R. HNO<sub>3</sub>; and I believe it not a bad idea to do so, as the oddity of the nomenclature will point out per se the fact that the salts are addition and not substitution salts. Personally, I believe that all alkaloidal salts are merely the result of the saturation of the trivalent nitrogen atom, the same becoming pentavalent. This process is, of course, different from the ordinary formation of salts, which is plainly a double decomposition, due to the more stable rearrangement of the chemical affinities. Only four possibilities present themselves as solutions of the problem, and these are: (1) *Alkaloid hydrochloride*—i. e., giving the

entire name of the acid, with prefix "hydro" in all cases, to point out the fact that the salt is an addition salt; (2) *Alkaloid chloride*—merely giving the acid radical portion of the acid as the name of the acid; (3) *Alkaloidonium chloride*—which says that in the process of its nitrogen assuming pentavalency the alkaloid has altered its character and become of the nature of a metal; and (4) *Hydro-alkaloid chloride*—which points out that the salt formation has resulted in the hydration of the alkaloid, and the formation at the same time of the chloride of this hydrated alkaloid. Nos. 1 and 4 are tenable and uncontroversial; but Nos. 2 and 3 are untenable, because the salt is not the chloride of the alkaloid, but of the hydrated alkaloid (H. R. Cl.) in case of No. 2, and because it is not a fact that monohydrated alkaloids act like metals and are liberated as such if set free, in the case of No. 3. It hence remains to select between Nos. 1 and 4, both of which are, chemically speaking, correct; but, as they are practically identical, we naturally select the more euphonious and least grating of the two and adopt as the most correct and hence preferable, No. 1, "alkaloid hydrochloride."

When I suggested the change from "hydrochlorate" to "ide" I had in mind only the fact that the former was certainly incorrect, while the latter was correct. Whether the latter was the most suitable did not enter my mind at the time, or whether other pos-

sibly also correct nomenclatures were perhaps better.

I do not approve of your suggestion of adopting the apostrophe to replace the prefix "hydro," because it may lead to confusion, as it is easily omitted and overlooked and there may arise an instance where the chloride of the alkaloid, as well as the hydrochloride, are known, in which case confusion would surely result. By the chloride of the alkaloid I mean the alkaloid plus one or two chlorine atoms, which may be added to the other portion of the pyridine or benzene or other nucleus, and not to the nitrogen atom, thus:



This is, of course, a forced example, since this latter compound does not exist; but it might be formed, and, if so, would *not* be a substitution product, and would not be called dichlor-pilocarpine.

I hence maintain that "cocaine hydrochloride" is correct and the best nomenclature for the salt; and, further, that "morphine sulphate" is incorrect, chemically speaking, and should be "morphine hydro-sulphate," for morphine sulphate is  $(C_{17}H_{19}NO_3)_2 SO_4$ , while our salt, as we know, is  $(C_{17}H_{19}NO_3)_2 H_2SO_4$ .

I have given you all that I have to say in reference to the subject, and I place the same at your disposal. Pharmacy should, of course, speak the language of chemistry; and the sooner she adopts it in toto, the better for pharmacy. I am pleased at the interest you have taken in the matter, and wish you success.

ALFRED R. L. DOHME.

**RASH TO PREDICT ADOPTION OF THE  
"-IUM" TERMINATION**

[PROF. A. B. PRESCOTT, M.D., PH.D.—Dean School of Pharmacy, University of Michigan]

As compared with other sciences, chemistry has been fortunate in the adoption of systematic nomenclature. But we have not by any means reached a regular nomenclature for all classes of organic compounds. The most ambitious attempt to do this by agreement was made at the International Conference of Chemists, at Geneva, in 1892. That Conference does not appear to have dealt specially with the naming of the salts of the organic bases. The recommendations of the Conference have had some effect, but scientific nomenclature is a matter of growth more than of convention.

It is only the quarternary bases formed of univalent alkyls that have entirely rational names for their salts and their hydroxides. We say "tetramethyl-ammonium iodide," or, with Beilstein, "tetramethylium iodide," and always "tetramethylphosphonium iodide," etc., etc. Chemists commonly say "trimethyl-ammonium iodide."

Nevertheless, the quarternary organic bases, having stable hydroxides, are termed *ammonium bases*, in contrast with the primary, secondary, and tertiary bases. The latter form salts as stable as does ammonium itself. It is quite true that the valency of nitrogen in all ammonium compounds and amine salts remains an open question, but at any rate all these compounds have enough common character to be named in unison.

We must wait for systematic nomenclature of the salts of pyridine derivatives. In salts of quarternary bases the name "pyridinium," or "quinolinium," has been ventured upon here and there by chemical writers, but without present advantage. It would be rash to predict that the "-ium" termination will come into use for the alkaloidal salts. It is safe to say "pyridine-methyl nitrate." It would be in one sense correct to say "pyridine-hydrogen nitrate," or "cocaine-hydrogen chloride," but the longer name is not, upon the whole, as precise as the shorter one.

ALBERT B. PRESCOTT.

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**'CHLORID, 'IODID, 'NITRATE, ETC.**

[PROF. T. H. NORTON, University of Cincinnati;  
Chairman Committee on Nomenclature of  
the Am. Ass'n for Adv. of Science]

I have read with great interest your valuable pamphlet on the nomenclature of our alkaloidal salts, and I am heartily in favor of the adoption of your proposed method, i. e., the use of 'chlorid, 'iodid, 'ni-

trate, etc., as the nearest approach to uniformity in nomenclature which we can at present in any simple way attain.

A nomenclature based upon that of the ammonium compounds is logically the correct outcome, and I hope that we may see it introduced in the near future. It will, however, involve much discussion and deliberation.

Your proposal is simple, feasible, and understandable.

T. H. NORTON.

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**THE "-IUM" TERMINATION NOT ADVISED**  
[PROF. IRA REMSEN, PH.D.; Editor American  
Chemical Journal]

I do not think I can state my opinion on the subject of the nomenclature of the salts of the alkaloids more clearly than I did in my letter to the *Drug News* twelve years ago. So far as chemistry is concerned, the situation has not changed since then. "Hydrochloride" and "hydrochlorate" will both continue to be used. Such terms as "hydrococaine chloride" will not be used, because they are misleading; and such as "cocainium chloride" are also objectionable. They are based upon a theory that has to be extended to meet the case of every alkaloid.

I. REMSEN.

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**RESTRICT "HYDRO" PREFIX TO HYDRACID SALTS**

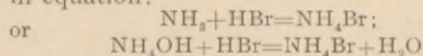
[PROF. CHARLES CASPARI, JR., Permanent  
Secretary A.P.H.A., Professor of Pharmacy  
Baltimore College of Pharmacy]

\* \* \* For the past few years I have



used the terms "hydrochloride," "hydrobromide," and "hydroiodide" exclusively, when speaking of the salts of alkaloids with hydracids, and have endeavored to impress upon my students that such terms are alone correct. I can see no necessity for using such terms as "hydrosulphate," "hydronitrate," "hydrocitrate," "hydrosalicylate," etc., since we do not use the prefix "hydro" when speaking of the respective acids. It does not seem to me that consistency requires us to add the prefix "hydro" in the case of salts of the oxyacids simply to show that the H of the acid is not displaced when these acids are neutralized by alkaloids. I take it that in the case of hydracid salts the prefix "hydro" at once indicates the difference between halides and hydracid salts, and students can easily be taught that the terms "iodide," "bromide," and "chloride" are not applicable to alkaloidal salts. The difference between alkaloidal hydrobromides, hydroiodides, etc., and alkaloidal bromides and iodides in the form of perbromides and periodides can easily be explained. No H being split off (at least to the best of our present knowledge) in the union of alkaloids and hydracids, we should indicate this fact by retaining the full name of the acid and simply change the ending "ic" into "ide" for the salt, the ending "ide" having been universally adopted (recently changed to "id") for compounds of the halides. The terms "hydrochlorate," "hydrobromate,"

and "hydroiodate" might be mistaken by some to indicate salts of oxyacids of Cl, Br, and I, although we do not use the prefix "hydro" for these acids. For ammonium salts the terms "chloride," "bromide," and "iodide" are undoubtedly correct, and the use of the prefix "hydro" would be improper, for H is split off and halides are formed. Whether we consider ammonia as  $\text{NH}_3$  or  $\text{NH}_4\text{OH}$ , the H of our hydracids separates, as is clearly shown in the following equation:



As I can see no reason whatever for speaking of "hydronitrates," "hydrotartrates," etc., the use of a comma (,) in "nitrate," "tartrate," etc., also appears quite unnecessary and even confusing. Let pharmacists understand clearly that in all alkaloidal salts the H of the acid remains, and that in the case of the salts of hydracids the prefix "hydro" is retained as part of the name of the acid, and that the ending "ide" is used to indicate the difference between salts of hydracids and oxyacids. I think the confusion will then rapidly disappear. That the ending "ate" is used for salts of all oxyacids, is known to every one who has studied pharmacy or chemistry.

The study of alkaloidal salts has shown thus far that the alkaloids differ from other substances in their behavior toward all acids, the hydrogen of the acid not being split off or displaced and the salts apparently

forming by simple addition of the base and acid. The names of alkaloidal salts are derived from the names of the respective acids, and the same endings should be employed to indicate the difference between hydracid and oxyacid combinations, as in the case of all other salts; but in order to distinguish between alkaloidal salts of hydracids, as retaining the acid hydrogen, and other salts of the same acids in which the acid hydrogen is displaced, it is desirable to use the prefix "hydro," a part of the name of the acid, in connection with the name indicating the particular hydracid compound of the alkaloid, thus: "hydrochloride," "hydrobromide," etc. The use of the prefix "hydro" in connection with oxyacid salts of the alkaloids appears unnecessary and confusing, since it is not a part of the name of the respective acids; the terms "sulphate," "citrate," "phosphate," "nitrate," etc., are therefore perfectly proper as applied to alkaloidal salts, in spite of the fact already stated that oxyacids also retain their acid hydrogen when forming salts with alkaloids.

The ending "ide" (or "id," as now preferred by many) should be retained as distinctive for all simple combinations of two elements, or of elements with groups acting as elements. The salts of the hydracids surely belong in this category, as in every combination with metals a simple union of the haloid and the metal results; and the use of the ending "ate" employed for salts of

acids ending in "ic" does not therefore appear warranted in the case of hydracid salts. The fact that the alkaloids do not combine directly with the haloid elements, is simply an exception to the general rule in the formation of hydracid salts, and should not interfere with long-established nomenclature.

CHAS. CASPARI, JR.

#### RELATIONS OF CHEMICAL TO GENERAL NOMENCLATURE

[PROF. H. H. RUSBY, M.D., New York College  
of Pharmacy, Member U. S. P. Committee  
of Revision]

Discussions of the nomenclature of special subjects do not always keep sight of the principles that have already been established for nomenclature in general. The nomenclature of chemistry is one of the last to be recognized, and it should derive great assistance from a study of the conclusions already reached in other departments of science. In the biological sciences it has been found necessary—or, at least up to the present, highly desirable—to follow different rules in treating scientific terms from those followed in treating the names of the objects studied. The former subject has been called "terminology," the latter "nomenclature." It has been found almost—if not quite—a matter of necessity to change scientific terms as the ideas which they represent are modified through discovery; but it has been found equally desirable to change as little as possible the scientific names of things, and here priority, in both botany and zoology,

has been accorded the highest importance in deciding between names. Indeed, the first name given must always remain the name, whether it be used or not.

When for any reason it is proposed to change names, two classes of cases are recognized. In the first case, a new name is to be applied to a known thing, and this is not a very serious change. By it the thing merely comes to have two names instead of one, and the only evil is an addition to synonymy. In the other case, a previously recognized name is given to a different thing; a much more serious matter, as it at once involves doubt as to which thing is referred to when the name is seen in use. This action has always been regarded as highly objectionable. It is opposed to the chief object of the existence of a scientific, as opposed to a vulgar, nomenclature, that of precision of meaning. If only uniformity in the different departments of science were concerned, we might well doubt whether any special nomenclature can permanently exist on a basis opposed to that generally adopted. There are, however, several reasons why such a procedure would be more objectionable in chemistry than elsewhere. The names of organic beings are commonly followed by the names of their authors, so that if the same name has been applied by different authors to different things, we can always ascertain from the records which thing is to be understood.

This practice does not prevail in chemistry. Although it has been found necessary in the case of some alkaloids and other substances to append the name of the discoverer, the cases are exceptional and the practice would not be applicable to numerous series of salts.

Again, we have before us the very important practical results that would be effected by introducing confusion into the nomenclature of potent medicinal agents, by having two things called by the same name. If a general agreement could be reached in advance, it would be only less bad, but failing this, it would appear altogether indefensible and its ultimate rejection would be pretty certain.

So far as the Pharmacopœia is concerned, there is a long line of precedents establishing this custom, and there is also a direct enunciation of the principle that, "In the choice of titles of official articles it is recommended that convenience, established custom, and considerations of safety against mistakes through similarity or changes in names, should outweigh purely theoretical consideration or scientific preciseness" (U. S. P., 7th Revision, p. xxv).

This principle is illustrated in such titles as "Prunus Virginiana," followed by a definition that carefully excludes the bark of the plant *Prunus Virginiana*, and "Rhus Toxicodendron," defined as the leaves of *Rhus Radicans*. The Pharmacopœia has no choice as to the names used in the definition. It can

not pose as a botanical authority, but must itself follow such authority in the use of plant names. Its titles, however, are its own property, and it has decided on what lines to form them.

In the case of chemicals there is no such state of affairs, there being no definition in which to specify the name indorsed by chemical authority for the substance named by the title. The formula, in a certain way, constitutes such a specification, but it does not mention the chemical name. It would seem to be a wise procedure to introduce chemical definitions, in which the chemical name is specified, in those cases where the form of the title does not agree with chemical authority. In any case the essential point is that the title itself is not the place for introducing a chemical name, when the form of that name violates the principles on which the work is compiled.

I perhaps have no special authority to discuss chemical nomenclature, but I have given special study to the general subject and to the position of the Pharmacopœia regarding it, and I should not like to see any inconsistency introduced.

As regards the use of the termination "ide" in the names, where appropriate, it does not appear that it would violate any essential principle of the work, and I should prefer to see this termination introduced; but the introduction of a new and dangerous application of the prefix "hydro" would

seem very objectionable until after it had been pretty generally accepted in chemistry, in popular usage as well as by authority. This is written in spite of the fact that every effort to make names accurately expressive is heartily appreciated by the writer.

H. H. RUSBY.

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**PREFERENCE FOR "IA" AND "IUM" TERMINATIONS**

[DR. W. SIMON, Professor of Chemistry Maryland College of Pharmacy]

I have placed myself on record for many years past as being decidedly opposed to the terms hydrochlorate, etc., adopted by the U. S. P.

In my opinion, the best solution of the problem would have been to use the endings "ia" and "ium" for the free alkaloids and their salts, respectively, as we have done and do now for *ammonia* and *ammonium* compounds. This would give us "morphia," "strychnia," etc.; but "morphium acetate," "strychnium chloride," etc. If the above method is not adopted, the terms "hydrochloride" and "hydrobromide" are vastly superior to the terms "hydrochlorate" and "hydrobromate." You are right in saying that for the sake of consistency the terms "hydronitrate," etc., had better be used; but, as the highest chemical authorities, both in this country and in Europe, use simply "sulphate," "nitrate," etc., I think the pharmacists might leave this nomenclature as it stands, at least for the present.



Whether apostrophizing the long terms to "bromide," "phosphate," etc., is of practical value, I am not prepared to say; in fact, I somewhat doubt it. W. SIMON.

#### A PHYSICIAN'S OPINION

[DR. D. K. SHUTE; Dean Medical Dept.  
Columbia University]

\* \* \* In my judgment, it is most desirable that Pharmacy and Chemistry should speak the same language.

In giving my opinion I speak, of course, only as an amateur in chemistry; although, as a physician, I have always been much interested in the study of chemistry.

I am always in favor of amending nomenclature where the amendment leads to greater clearness and consistency. For instance, it seems to me a great barbarity that pharmacists should say that the antidote to arsenic is the freshly prepared "hydrated sesqui oxide of iron," instead of "ferric hydrate."\* It also seems a puzzling inconsistency that under theoretical chemistry we should be told that an ortho acid is one in which we find as many molecules of hydroxyl as the negative element has bonds, that is, as many hydrogen as oxygen atoms, and then under practical chemistry be told that  $H_3PO_4$  (phosphoric acid) is an ortho acid.†

\* $Fe_x(OH)_x$  is variable to  $Fe_xO_x(OH)_2$ .

†The following definition of an ortho acid seems preferable: "The one of several acids of the same element, which actually occurs with the greatest number of hydroxyl groups; as orthophosphoric acid." W.

It seems to me the climax of inconsistency to say "chloride of ammonium" and "hydrochlorate of cocaine."

It would appear that contractions like "'chloride" and "'sulphate" are preferable to the other expressions that are constantly used; the "*coma*" before the contractions will die a natural death.

What you say of the physician's training in "incompatibles" is very important, and such terms as "hydrochlorate" are very confusing to medical students and practitioners alike.

D. K. SHUTE.

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**HYDROCHLORIDE AND HYDROSULPHATE, OR CHLORIDE AND SULPHATE**

[PROF. A. B. STEVENS, PH.C.; Member A. Ph. A. Committee of Revision]

I am pleased to learn that you are agitating the question of nomenclature. The ending "ate" for salts formed by combination of alkaloids with the acids hydrochloric, hydrobromic, and hydroiodic, is certainly wrong and should no longer be fostered. However, the question of "chloride" or "hydrochloride" is not so easily dismissed. If we are to retain the prefix "hydro" for alkaloidal salts of hydrochloric, hydrobromic, and hydroiodic acids, then let us be consistent and extend its use to all corresponding salts of the alkaloids, as quinine, "hydrosulphate," "hydronitrate," etc.

I decidedly prefer quinine "chloride," "iodide," and "bromide," especially if the

names quinine "sulphate" and morphine "sulphate" are to be retained.

A. B. STEVENS.

**"CHLORIDE," "NITRATE," ETC., FOR  
CONSISTENCY**

[PROF. OSCAR OLDBERG, Ph.D.; Dean Northwestern University School of Pharmacy;  
Member U.S.P. Committee of Revision]

\* \* \* The views you express coincide entirely with those I have always held. I am heartily in favor of such terms as "strychnine nitrate," "strychnine chloride," etc. Such terms are consistent with each other and are not ambiguous.

OSCAR OLDBERG.

[The writer did not go quite so far as Dr. Oldberg, but favored a position like that taken by Dr. Dohme, involving such terms as "hydrochloride" and "hydrosulphate," which are both accurate and consistent; and, then, to make the change practical, apostrophizing these terms to "chloride" and "sulphate." The position was designed to be a happy medium between the very practical idea of Dr. Oldberg and the very accurate view of Dr. Dohme. The full and correct name for  $C_{20}H_{24}N_2O_2.HClO_3$  would naturally be quinine hydrogen chlorate, which would be contracted to quinine hydrochlorate just as quinine hydrogen chloride is abbreviated to quinine hydrochloride. But as quinine hydrochlorate has so long been used as the name for the salt formed by quinine with hy-

drogen chloride, we cannot apply the term to another salt without incurring the dangers which Dr. Rusby cautions against. As it was inaccurate to call an *addition* product with hydrogen chlorate ( $\text{HClO}_3$ ) a chlorate, and as it was unsafe to give it its correct name hydrochlorate, the writer suggested 'chlorate as being as accurate as was consistent with safety and as practical as was consistent with accuracy. He admits, however, that expediency points to accepting Professor Caspari's view of the case.—S. W. W.]

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**CHLORIDE, BROMIDE, ETC., FOR SIMPLICITY**

[PROF. WM. H. GREENE, Philadelphia]

\* \* \* There can be no valid reason why Pharmacy and Chemistry should not speak the same language when dealing with same matters.

The rules for abstractors for the *Journal of the Chemical Society* of London still sanction the use of "hydrochloride," etc., for salts of alkaloids and prohibit the use of "hydrochlorate."

Since it is quite understood by chemists and pharmacists that alkaloids do not unite directly with acid radicals; since, also, chemists and pharmacists agree that it is exceedingly probable that the alkaloids do not unite with acids per se, but rather with the acid ion *and* the hydrogen, is it not preferable to sacrifice absolute accuracy of descriptive nomenclature, as suggested by Dr.

Remsen and Dr. Barker, to obtain a simplicity of form that can involve no error of conception?

With all due respect to committees, the continued use of words like "hydrochlorate" and "muriate" appears unpardonable. "Chloride," "bromide," "sulphate," etc., for salts of the alkaloids could hardly be unintelligible to a chemist or a pharmacist.

WILLIAM H. GREENE.

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**THE VALUE OF THE APOSTROPHE  
RECOGNIZED**

[PROF. L. E. SAYRE, PH.G., PH.M.; Professor of  
Pharmacy University of Kansas; Mem-  
ber U.S.P. Committee of Revision]

\* \* \* I would say that at first thought I did not like the novel idea of using the apostrophe, as you have suggested. But, on further study, I have concluded that the use of the apostrophe would be helpful in economizing space; and when the prefix "hydro" is omitted, it will prevent ambiguity. It will at once show that the substance thus designated is the product of a different reaction from that between a metal and an acid. I should be very sorry, however, to see the pharmacist take the initiative in abbreviating the names of alkaloidal salts in this way; he may well *suggest* it.

L. E. SAYRE.

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**RETAIN THE "HYDRO-" PREFIX**

[DR. E. H. BARTLEY; Dean of the Brooklyn Col-  
lege of Pharmacy; Member of A. Ph. A.  
Committee of Revision]

In reply to your query as to my idea of

the proper nomenclature of the alkaloidal salts, I must say that I am not satisfied with the nomenclature of the last U. S. P.

The only object of entering into such a discussion is to try to secure uniformity. The first thing we should do, very naturally, is to learn what the custom is in other countries, speaking the same language, and then the custom in other languages. We find that the custom in England, in regard to the salts of the alkaloids with the halogen acids, is to use the names "hydrochloride," "hydrobromide," "hydroiodide," etc. This is also the custom in the Colonies, where the English language is used. These seem to be the proper terms.

All inorganic salts derived from HCl are always called chlorides, while the term chlorate is reserved for the salts of chloric acid. If an alkaloid should be found that combines with the Cl alone, there could be no question that it must receive the name of chloride. When the alkaloid takes up the hydrogen, as well as the chlorine, I cannot see why it should receive a name that indicates that the acid is a ternary acid. The termination "ate" has a definite meaning in chemical nomenclature, which is entirely at variance with this use. I suppose this ground has been gone over very fully, and all the arguments have been ably presented, but I cannot see any reason in the use of cocaine "hydrochlorate" for "hydrochloride," any more than the use of antimony

“oxychlorate” for “oxychloride.”

I do not favor the contraction of the names of these alkaloidal salts into “chloride,” “bromide,” “iodide,” etc., for that would interfere with the differentiation of two groups of very differently constituted compounds. The prefix “hydro” has a well-known place in the nomenclature of organic bodies, and must be retained for the designation of the hydro substitution compounds and the addition compounds such as those under discussion.

E. H. BARTLEY.





TABULAR SUMMARY

Column *A* of the table herewith gives the notation of representative alkaloidal salts as accepted by both Chemistry and Pharmacy. Accuracy and consistency would give these salts, as "addition products," the names appearing in columns *B*, *C*, or *D*.

In arguing for the adoption by Pharmacy of the nomenclature of modern chemistry, the writer was met by the objection that such terms as "hydrochloride" required for consistency such objectionable names as "hydrosulphate." He therefore proposed the use of the apostrophe (column

*D*) as affording the easiest and most practical way of avoiding the difficulty.

Some authorities regard any recognition of the unreplaced hydrogen of the combining acid as unimportant and would adopt column *D* without the apostrophe. A careful comparison of columns *C* and *G* will show how impractical it is to adopt both accurate and consistent terms. A perusal of the letters from Drs. Prescott, Remsen, Norton, and Simon shows that the best authorities are divided on the advisability of applying the ammonium theory to the nomenclature of alkaloidal salts. The theory is admittedly a good one, even though in trying to support it we may be

unable to prove either the existence of a true ammonium hydroxide (hydrate) or ammonium amalgam; but it is nevertheless simply a theory, and it would hardly seem advisable to change both notation and nomenclature until actual determinations of the constitution of alkaloidal salts prove the theory correct.

The most expedient and least confusing change will be to accept *E*, imperfect as it is. Pharmacy will then agree with chemistry, and we may look for uniformity in labels. This will require a change of only two letters in present pharmacopœial terms for hydracid alkaloidal salts and no change in the case of the oxyacid salts.

A	B	C	D	E	F	G	H	I	J
Accepted Notation of Representative Salts.	Full Designation — Name of Alkaloid + Name of Acid.	Consistent Natural Contractions.	Consistent Practical Contractions.	Usage of Modern Chemistry.	Terms largely Obtaining in Commerce.	Names Agreeing with Pharmacopœial Nomenclature.	Notation Agreeing with the Ammonium Theory.	Nomenclature Agreeing with the Ammonium Theory.	Names of the Free Alkaloids According to Ammonium Theory.
$C_{17} H_{21} N O_4 . HCl$	Cocaine hydrogen chloride.	Cocaine hydrochloride.	Cocaine 'chloride.	Cocaine hydrochloride.	Cocaine muriate.	Cocaine hydrochlorate.	$C_{17} H_{21} N O_4 Cl$	Cocainium chloride.	Cocainia.
$C_{17} H_{19} N O_2 . HBr$	Morphine hydrogen bromide.	Morphine hydrobromide.	Morphine 'bromide.	Morphine hydrobromide.	Morphine bromide.	Morphine hydrobromate.	$C_{17} H_{20} N O_2 Br$	Morphium bromide.	Morphia.
$C_{21} H_{23} N_2 O_2 . HI$	Strychnine hydrogen iodide.	Strychnine hydroiodide.	Strychnine 'iodide.	Strychnine hydroiodide.	Strychnine iodide.	Strychnine hydroiodate.	$C_{21} H_{23} N_2 O_2 I$	Strychnium iodide.	Strychnia.
$C_{17} H_{21} N O_4 . HCl O_2$	Cocaine hydrochlorate.	Cocaine hydrochlorate.	Cocaine 'chlorate.	Cocaine chlorate.	Cocaine chlorate.	Cocaine chlorate.	$C_{17} H_{21} N O_4 Cl O_2$	Cocainium chlorate.	Cocainia.
$C_{17} H_{19} N O_2 . HBr O_2$	Morphine hydrogen bromate.	Morphine hydrobromate.	Morphine 'bromate.	Morphine bromate.	Morphine bromate.	Morphine bromate.	$C_{17} H_{20} N O_2 Br O_2$	Morphium bromate.	Morphia.
$C_{21} H_{23} N_2 O_2 . HI O_2$	Strychnine hydrogen iodate.	Strychnine hydroiodate.	Strychnine 'iodate.	Strychnine iodate.	Strychnine iodate.	Strychnine iodate.	$C_{21} H_{23} N_2 O_2 IO_2$	Strychnium iodate.	Strychnia.
$(C_{20} H_{24} N_2 O_2)_2 . H_2 SO_4$	Quinine hydrogen sulphate.	Quinine hydro-sulphate.	Quinine 'sulphate.	Quinine sulphate.	Quinine sulphate.	Quinine sulphate.	$(C_{20} H_{25} N_2 O_2)_2 SO_4$	Quinium sulphate.	Quinia.
$C_{15} H_{21} N_3 O_2 . HC_7 H_5 O_2$	Physostigmine hydrogen salicylate.	Physostigmine hydrosalicylate.	Physostigmine 'salicylate.	Physostigmine salicylate.	Physostigmine salicylate.	Physostigmine salicylate.	$C_{15} H_{22} N_3 O_2 C_7 H_5 O_2$	Physostigmium salicylate.	Physostigmia.









