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The Oleates in Cutaneous Diseases.*

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Attention was first directed to the existence of oleic acid about 1811, by Chevreul, and some mention of the oleates may be found in the pharmacy of France of that time. The earliest English paper on the subject was by Attfield, in 1862.† It was not until the paper by Mr. John Marshall‡ was published, in 1872, that much interest was awakened in the subject. Since that time several communications on the oleates, both as regards their pharmacy and therapeutics, have appeared in the current medical literature.§

There are two methods of preparing the oleates, each of which has its advocates. The older method is by the direct combination of oleic acid with the base. The new method is by double decomposition, the oleate of sodium with a neutral metallic salt. Unquestionably the preparations by the latter method are, in appearance at least, superior to the older oleates; in regard to the therapeutical effects, they are also probably better, although excellent results may be secured with the preparations made by the older method. It is highly probable, however, that the method of manufacture by double decomposition will entirely supplant the old process.

Introductory to the consideration of the individual preparations, the following notes on the manufacture of oleic acid and the oleates may prove of interest:

First as to the preparation of oleic acid. One of the best and cheapest methods of preparing it is as follows: The oil of sweet almonds is saponified with the oxide of lead, having an excess of oxide of lead present so as to be sure of complete saponification of the oil. The product so obtained is put in benzin, which dissolves the lead oleate, while the lead palmitate is deposited. The solution of the

* Reprinted from the "Med. and Surg. Rep." for March 15th, 1884.

† Pharmaceutical Journ. and Trans., 1862-63, vol. 4, p. 388.

‡ Lancet, May 25, 1872, p. 709.

§ Crocker: Medical Record, 1879, p. 123; Wolff: Amer. Jour. of Pharmacy, Jan. 1879, p. 8; Nov., 1883, p. 445; Shoemaker: Trans. Penna. State Med. Soc., 1879, p. 707; Medical Bulletin, July, 1882, p. 584; Squibb: Ephemeris, No. 6, Nov., 1882, p. 152.

lead oleate is decanted and shaken with diluted hydrochloric acid (1 to 7); this separates the lead chloride and leaves a benzin solution of oleic acid, which, after the expulsion of the benzin, gives an acid that is well adapted for the manufacture of the oleates. The oleic acid so obtained is of a light-yellow color, readily miscible with 92 per cent. alcohol in all proportions without causing turbidity. (Wolff.)

The oleate of sodium may be obtained by saponifying the acid with caustic soda. A solution of this and a solution of a metallic salt brought together, will give a precipitate of the oleate.

As this method of obtaining the oleates by double decomposition is, however, somewhat expensive, the following method may be employed: One part of castile soap (sodium oleo-palmitate) is dissolved in eight parts of water; this is allowed to stand for twenty-four hours, when there will be a considerable deposit of sodium palmitate. The supernatant liquor containing mostly sodium oleate, is drawn off and decomposed with a concentrated solution of a metallic salt, which, if obtainable, should contain no free acid to prevent the formation of free oleo-palmitic acid. The heavy deposit of oleo-palmitate so derived is strained off, pressed out in the strainer, and the adherent water evaporated over a water-bath; afterwards it is dissolved in about six to eight times its quantity of petroleum benzin, and the insoluble palmitate is left to subside while the solution of the oleate decanted therefrom is filtered off. The benzin evaporated will yield an oleate that is a chemical combination, and one that will remain stable and efficacious. (Wolff.)

The oleates, whether made by the direct combination of the acid with the oxides or by the process of double decomposition, are fixed salts, and the designations of five per cent., ten per cent., etc., oleates, are misnomers, and wholly incorrect. The so-called per cent. oleates are solutions of the oleates in free oleic acid; for example, the so-called ten per cent. oleate of mercury is so named for the reason that ten parts of mercuric oxide are added to ninety parts of oleic acid, and combination allowed to take place. The oxide, however, only requires a certain proportion of the ninety parts of the oleic acid for the production of the oleate, so that there must be a considerable quantity of the acid which is not needed for the combination; in other words, the so-called ten per cent. mercuric oleate (and the same applies to the other per cent. oleates) is a solution of the oleate in free oleic acid.

It will be readily seen that this manner of speaking of the oleates, therefore, is not only misleading, but erroneous, and should be dis-

carded. If a diluted oleate is required for application it may be ordered in the same manner that all dilutions are prescribed—so much of the oleate and so much of the diluent.

It is not my purpose to present in detail the chemistry and pharmacy of each particular oleate, as the foregoing remarks, with the subjoined table, showing the percentage of base in each salt, will give an insight into their mode of manufacture and composition :

Aluminium oleate contains 3.1 % metallic aluminium equivalent to 17.9 % aluminium hydrate.			
Arsenic oleate	"	8.16 % metallic arsenic	" 21.5 % arsenious acid.
Bismuth oleate	"	19.9 % metallic bismuth	" 44.3 % bismuthyl oxide.
Copper oleate	"	10.1 % metallic copper	" 12.8 % cupric oxide.
Iron oleate	"	9.04 % metallic iron	" 11.5 % ferrous oxide.
Lead oleate	"	26.7 % metallic lead	" 29.2 % plumbous oxide.
Mercury oleate	"	26.2 % metallic mercury	" 28.35 % mercuric oxide.
Quinia oleate	"	57.2 % quinia.	
Silver oleate	"	27.6 % metallic silver	" 59.3 % silver oxide.
Zinc oleate	"	10.4 % metallic zinc	" 12.9 % zinc oxide.

OLEATE OF ALUMINIUM—In color, light yellow, of plastic consistence, and somewhat adhesive. For application, it should be melted with an equal part of a fatty base, such as lard or cosmoline. It possesses an astringent action, as well as being somewhat stimulating. It may be prescribed in all skin diseases in which there is much discharge, such as dermatitis, pustular eczema, etc. In the treatment of simple ulcers an ointment of this oleate is frequently productive of improvement. In pustular eczema of children, it is useful, checking the discharge and exerting an alterative action on the diseased skin. An excellent ointment for such cases is the following :

R.	Hydrargyri chlorid. mit.,	gr. xx.
	Aluminii oleatis,	
	Petrolati,	āā ʒ ss.
Ft.	ugt.	

OLEATE OF ARSENIC.—In color, reddish-yellow, solid and granular, melting over a water-bath ; insoluble in alcohol, but soluble in petroleum benzin, a filtered solution of which, if treated with hydrogen sulphide, will give a yellow precipitate of sulphide of arsenic. It should be melted with from two to six parts of a fatty base for dermic application. In epithelioma and the ulcerations of lupus, it may be found useful. It is, however, in these diseases, inferior to other well-known methods of treatment. In a few cases of psoriasis, its appli-

cation in the form of an ointment of the strength of one drachm to the half ounce of lard, has appeared of benefit. So far as experience has shown, its use is very limited.

OLEATE OF BISMUTH.—Pearly-gray in color, smooth, and of the consistence of ointment, and should show no trace of suspended solids when rubbed on the skin. This oleate is generally applied full strength, and is indicated in all cutaneous affections in which a soothing ointment is required. It should be gently rubbed over the parts, and the application repeated several times daily. In such diseases as sycosis non-parasitica, dermatitis, etc., this oleate is often productive of great benefit. One of the best soothing ointments that may be prescribed, is the following :

R.	Zinci oleatis,	
	Bismuthi oleatis,	āā ʒ ij.
	Ugt. aquæ rosæ,	ʒ iv.
Ft. ugt.		

This is to be rubbed over the parts or applied spread upon muslin as a plaster. In all cutaneous inflammations, from whatever cause, this oleate proves soothing and healing. In burns and scalds it will often be found of value.

OLEATE OF COPPER.—In color, dark green, occurring both in the granular and solid forms, and possessing a slightly oily odor. For dermic use it should be melted with from two to six parts of lard, oleic acid or vaseline. Such an ointment is astringent, decidedly stimulating, and more or less destructive to the vegetable parasites. Its principal application has been in the treatment of ringworm of the scalp. A twenty per cent. ointment may be used in this disease, and it should be rubbed in once or twice daily. My experience with it in the treatment of ringworm has not been one that would support its vaunted superiority over other methods; in fact, it has not seemed to possess any merit over a host of remedies which have been long in use, besides possessing the disadvantage of soiling everything with which it comes in contact. It is, for this disease, far inferior to the oleate of mercury ointment already mentioned.

In ulcers an ointment of this oleate will be found to exert a stimulating and healing influence, but the same disadvantage—its color—serves to render its use unpleasant.

OLEATE OF IRON.—In color, reddish-brown, of plastic consistence, and having a ferruginous and oily odor ; making with petroleum benzin a clear reddish solution. Applied to the sound skin it has very little, if any, action. To ulcerated, denuded or discharging surfaces, it has an astringent and stimulating effect. It may be used pure, or better with an equal part of lard or cosmoline. It has been suggested that this oleate be used to impress the general system, in cases in which the internal administration of iron preparations is contra-indicated. To say the least, this action is highly problematical ; and even if sufficient iron were absorbed, its color would prove a serious inconvenience to its use for inunction. As yet the utility of this oleate remains to be demonstrated.

OLEATE OF LEAD.—Yellowish-white in color, much resembling lead plaster, but somewhat harder and more brittle. A good ointment is made by melting with an equal part of oleic acid, vaseline, or lard ; as such it makes an excellent substitute for Hebra's litharge ointment, and will keep for an indefinite time. It is protective, astringent, and sedative, and may be prescribed whenever such an ointment is called for. In acute and subacute eczema its use is followed at times by rapid improvement. In the more chronic and sluggish forms of the disease, a proportion of oleate of mercury may be added to advantage. In order to secure a rapid and positive effect, the ointment of lead oleate should be kept constantly applied as a plaster, changing twice daily. In abrasions, erysipelas, and similar inflammations, the oleate ointment exerts a prompt and beneficial effect, reducing the inflammation and relieving pain and irritation. In dermatitis venenata an ointment of the oleate, such as mentioned, allays the intense burning, and frequently affords relief. In that troublesome affection of eczema of the nares, where light fissuring and pustulation take place, it will occasionally be found useful. In sycosis non-parasitica, the following formula will often prove of advantage :

R. Zinci oleatis,	
Bismuthi oleatis	āā ʒj.
Plumbi oleatis,	ʒ ij.
Adipis,	ʒ iv.

Ft. ugt.

This is to be applied to the parts twice daily, after thorough cleansing with warm water.

In eczema about the anus, this oleate ointment sometimes gives

relief. Vesicular eczema of the hands may often be rapidly relieved in the following manner: The parts are to be soaked in hot water for ten minutes, carefully dried with a soft towel, and then are to be covered with pieces of muslin thickly spread with the ointment. The application is to be renewed morning and evening; at each renewal the loose scales, crusts, and epiderm are to be gently rubbed off; no force should be employed, otherwise more harm than good will result. Treatment is to be continued for several days, at the end of which time the hands will be vastly improved. So much accomplished, a small quantity of calomel may be added to the ointment, and instead of applying it in the form of a plaster as before, it should be gently rubbed in two or three times a day. It is well to remark that although the disease is quickly brought into a favorable condition by the plan of treatment just mapped out, the progress thereafter is not so rapid.

OLEATE OF MERCURY.—In color, yellowish, somewhat adhesive, and of the consistence of ointment, with an oily odor. If pure, diaphanous and of a yellow color, but generally found of a grayish or greenish hue, showing the separation of mercurous oxide and metallic mercury, which will be found at the bottom of the vessel containing it.

Applied to the sound skin, this oleate produces more or less redness and irritation, and if its use is continued, may cause a dermatitis. It is rarely prescribed in full strength, but usually one part to from one to three parts of oleic acid or lard. One part of this oleate to two parts of oleic acid will give a preparation about similar in strength to the so-called ten per cent. oleate. Of all the oleates, this is not only the most important, but one that has been longest in use.

It has its principal field in the treatment of syphilis by inunction, and when employed for such purpose is efficient and cleanly, completely supplanting the old method of inunction by blue ointment. For this purpose, the oleate should be diluted with oleic acid, lard, or a combination of the two. A prescription made up as follows will answer admirably:

R. Hydrargyri oleatis,	3 iij.
Acidi oleici,	3 ij.
Cerati simplicis,	3 iij.

Ft. ugt.

A portion of this ointment of the size of the terminal joint of the forefinger suffices for an inunction. For each application a new sur-

face should be selected. As the oleate ointment is more irritating than the old mercurial ointment, and as it is, also, more readily absorbed, less friction should be employed, and the hairy and more delicate portions of the skin should, as far as possible, be avoided.

For all syphilitic eruptions, ulcerative or non-ulcerative, and especially the later and localized manifestations, the local use of an ointment of this oleate is an excellent adjuvant to the constitutional treatment; it should be applied and gently rubbed into each lesion. The ointment given above may be used; ordinarily, an ointment made up of one part of the oleate to four parts of benzoated lard will be found sufficiently active.

Another disease, in some cases of which this oleate seems to act almost as a specific, is chronic ringworm of the scalp. As a rule, it is, I think, more reliable than any other remedy, failing at times in obstinate cases, as do all other remedies, but in the majority of instances curing. In recent cases, a twenty per cent. ointment or solution will be effective; if the disease has existed a long time, a thirty, or even forty per cent. ointment may be employed. It is to be well rubbed in twice daily, and the head to go unwashed for a week or longer. Treatment, if it is to be permanently successful, must be continued for several months. Epilation, as in all other plans of treatment, is to be persistently practised. A combination which will be found useful in these cases is the following:

R.	Hydrargyri oleatis,	
	Picis liquidæ,	āā ʒ ij.
	Ugt. sulphuris,	ʒ iv.
Ft. ugt.		

It is to be applied morning and evening. As there is a tendency to chemical change, a quantity sufficient for a week or two only should be made at one time.

In all skin diseases in which ointments of red precipitate, white precipitate, and calomel are employed, this oleate, properly weakened, may often be substituted with advantage.

All indurations, swellings, and glandular enlargements, may occasionally be favorably influenced by applications of a mild solution or ointment.

In pediculosis capitis, and more especially in pediculosis pubis, a twenty-five per cent. ointment of this oleate will often prove curative.

The mercury oleate, in some instances, may be advantageously combined with the other oleates.

OLEATE OF QUINIA.—In color, brownish, of plastic consistence, and of a sweet and oily odor. So far, the use of this oleate has been limited to inunction to impress the system at large. For this purpose, it should be mixed with olive oil, lard, or oleic acid. In the past year another use has suggested itself. As is well known, lotions containing quinine have been employed for several years past for the treatment of premature baldness, seborrhœa, etc. Unquestionably the oleate is better adapted for this purpose than any lotion of quinine heretofore employed, and in the few cases in which it has been tried, has seemed to act favorably; and further experience in its use for these diseases, may corroborate the favorable impression already formed. The ointment which I have employed in the few cases referred to is the following:

R. Quiniæ oleatis,	3 j.
Adipis benzoat,	3 j.
Petrolati,	āā 3 iv.

Ft. ugt.

A small quantity of this ointment is to be rubbed in every evening, or less frequently, as may seem indicated.

OLEATE OF SILVER.—In color, grayish-brown, pulverulent, and possessing the oleic acid odor. As a powder, it may be dusted over ulcers for its stimulating and alterative effect. It may also be prescribed in ointment form, one drachm of the oleate to the ounce of lard or any fatty base.

OLEATE OF ZINC.—Dry, white, pulverulent, impalpable powder of a soapy touch, resembling powdered soapstone; if pure, should make a clear solution with oils, lard, etc., over a water-bath. It may be used either as a dusting powder or as an ointment. An ointment of one or two drachms to the ounce of cosmoline or any fatty base is most commonly used. Sometimes the oleate made up in ointment form with oleic acid seems to be more efficacious. A very good way of prescribing it is as follows:

R. Zinci oleatis,	
Acidi oleici,	āā 3 j.
Petrolati,	
Cerati simplicis,	āā 3 iij.

Ft. ugt.

To a great extent this oleate replaces the oxide of zinc, and may be ordered whenever that substance is indicated. Acute vesicular eczema

may be successfully treated with the application of black wash and the subsequent application of an ointment of oleate of zinc : the wash is to be applied with a sponge or soft rag for several minutes two or three times daily ; after each application has dried, a small quantity of the ointment being gently rubbed over. In some instances, the disease seems to be more favorably influenced by the oleate employed as a dusting powder. When such is indicated, the following will prove an eligible formula :

R.	Pulv. zinci oleatis,		
	Talci veneti,	āā	ijj.
	Amyli,		ʒ ij.
M.			

This is to be dusted over the parts several times daily. The same plan of treatment is frequently of advantage in all weeping eczemas. In intertrigo, a dusting powder, such as given above, is very comforting. This oleate makes a harmless toilet powder, and combined with talc and calamine, as in the formula below, will make an excellent powder for such purpose :

R.	Calaminæ præparatæ,		ʒ ij.
	Talci veneti,		
	Zinci oleatis,	āā	ʒ vij.
	Olei rosæ,		q. s.

M. S.—Toilet powder.

This last may also be employed as a dusting powder in moist eczema and similar inflammations.

In addition to the oleates already named, there are several others which have been employed in cutaneous diseases ; but either they have failed to show any therapeutical effect, or experience in their use has been so limited as to make special mention of them at the present time unnecessary ; these are the oleates of tin, antimony, nickel, cadmium, etc. The oleates of the alkaloids, morphia, aconitia, veratria, etc., are important, but as their use is confined to other than cutaneous medication, they fall beyond the scope of this paper.

Recapitulating, I may say that of all the oleates so far introduced for the treatment of diseases of the skin, the following may be considered as possessing therapeutic powers which experience has attested : Oleate of mercury, oleate of zinc, oleate of lead, and oleate of bismuth. The other oleates have as yet failed in adequately supporting any attested claim to curative powers ; further experience in their use may,

however, prove them worthy of a permanent place in dermic therapeutics.

In ordering the oleates, several points are to be kept in mind. If the action of the proposed ointment is to be mainly protective, then the oleate is best made up with one of the paraffinates; if there is to be a certain amount of penetrating power along with a protective influence, then a mixture of lard or oleic acid with a paraffinate is to be prescribed as the base of the oleate ointment; again, if penetration is the main point aimed at, then the oleate compound should be made up of lard, oleic acid, or a combination of the two.

In some cases (and they are by no means few) the oleates are found to disagree; instead of an improvement, a slight or marked aggravation occurs. In not a few instances this may be due to the bad quality of the oleate used; but that it may occur with oleates which are of the best manufacture, is beyond question.

In conclusion, it may be said, that the oleates are to be considered merely as additional means of treating cutaneous diseases, and are in no sense to be looked upon as panaceas, for often enough they must be discarded to give place to the older and more tried methods of dermic therapeutics.

[Since the above paper was published, the doubt in regard to the systemic effects following the use of inunctions of the oleates, implied in the remarks on the iron oleate, has been justified by subsequent observation,—with the exception, however, of the oleate of mercury. Even this oleate is not so freely or rapidly absorbed as heretofore supposed. In regard to the oleate of quinia, claimed by Squibb and others as capable of producing marked systemic effects when applied in quantity to the skin, my experience with it has been confined to its application to small surfaces in certain skin diseases, and, therefore, not of a character to warrant a positive opinion. The impression is, that like the other oleates, it is not appreciably taken up by the skin. It has been determined also (Dr. Wolff,) that the so-called oleates of the alkaloids are not true chemical combinations and may be for convenience, designated so much “per cent.” oleates or solutions.]