A BIBLIOGRAPHY OF RECENT WORK ON SUPPOSITORIES

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TABLE OF CONTENTS.

Introduction.

In the names suppository and pessary we have designations that originally indicated of modes or method of administration of ingredients rather than forms of administration. Ordinarily, medicaments to be applied internally, are administered per os. The potion, the powder, or any other form of administration, having been placed into the mouth, the tongue and the muscles of the mouth and throat do the rest. It is the natural function of the mouth to take in. To eject by mouth, in other words to vomit, while not necessarily unnatural, is a pathological rather than a normal function. The other visible openings that lead into the body, the sockets in which the eye orbs are set, the nasal cavities, the ear, the anus, the urethra and the vagina serve very different functions. Yet at an early date, man seems to have learned to use these entrances to the body, as they may be regarded, to administer medicaments and even food (per rectum).

In order to reach the interior by means of these channels, muscles could not be relied upon to take in the medicament. This had to be applied to the spot for which it was intended by means from without. Thus the early Greeks had learned to administer medicaments at the point of a

small stick or by spreading it by means of the vane of a feather. Both modes are still in use, the stick being commonly replaced by a metallic probe, the feather not infrequently by a camel's hair brush or by a small sponge attached to the end of a wire or grasped between the points of a forcep.

From this mode of administration to the one in which the medicament itself had been given the required shape to facilitate administration per rectum etc. was only a step. Thus the Greeks had balanoi [1.] (from balanos, an acorn, or anything that resembled an acorn in shape), also prosthemata [1.] an appendage, from pros, and tithemi, " a putting to" (pessary). They also wrapt the medicament in wool or cloth rhakos, [1.] (from rhakos, originally a ragged, tattered garment, later applied also to a rag, lint, Hippocrates- Dioscorides.)

With reference to the direction of administration, i.e. from above downward, or from below upward, a distinction was likewise made. This naturally depended upon the organ into which the medicament was introduced, also upon the position of the body at the time of application. Hence, we have the

suppository, (from sub, below or underneath, and ponere, positum, to put or place), i.e. anything that is administered from below or underneath; also the pessary (Lat. pessarium, pessum, pessus, Gr. pessos, Fr. pessaire),something that is dropped down, as it were, to the bottom of the organ(from Gr. pessos, bottom). That the direction of administration is not always adhered to can readily be understood when we remember that the difference of the position of the body at the time of administration may change the direction implied in the name of the form of administration to the opposite one. Thus e.g. the suppository of today always remains a suppository, irrespective of the position of the body during administration of this particular form of medication, hence irrespective of the upward, downward, or horizontal direction which the medicament takes when applied.

In order to give the medicament itself the desired form for administration, the Greeks shaped the finely powdered drug with fat and wax *) to acorn-like shapes(balanoi), or gave them the shapes of fingers *) and coated them with honey or gall.

(* Berendes, Das Apothekenwesen, p.31.)

The shape e.g. of the suppository naturally varies with regard to the organ into which it is to be administered. Certain standard shapes and sizes having become conventional, no doubt because experience has proven them most convenient and best adapted to a given purpose.

For possibly two thousand years, the shape was imparted to the suppository by hand, a bit of pharmaceutical technique that requires skill as well as time. The pharmaceutical manufacturer of the second half of the 19th century, as might be expected in an age of machinery, replaced this manual method by one involving the use of moulds. Not only did the older method consume time and frequently result in products that were not lege artis, but the hand method may be regarded as unsanitary. Moreover, the older method was not applicable to gelatin when this was introduced as vehicle. Paper and wooden moulds have been tried by dispensers only to give way to the metal moulds, of which

(* Schelenz, Geschichte, p.806)

a large variety have been invented. In recent years the ordinary mould has had to give way, in part at least, to the compressor, and this, in turn, is made unnecessary by the suppository shell, manufactured on a large scale from cacao butter or gelatin and supplied to the dispenser.

Suppositories of the U. S. P. 1820 to 1900.

Suppositoria	1820	N.Y. 1830	Phil. 1830	1840	1850	1860	1870	1880	1890	1900
Acidi Carbolici	-	-	-	-	-	-	+	-	-	-
Acidi Tannici	-	-	-	-	-	-	+	-	-	-
Aloes	-	-	-	-	-	-	+	-	-	-
Assafoetidae	-	-	-	-	-	-	+	-	-	-
Belladonnae	-	-	-	-	-	-	+	-	-	-
Morphiae	-	-	-	-	-	-	+	-	-	-
Opii	-	-	-	-	-	-	+	-	-	-
Plumbi	-	-	-	-	-	-	+	-	-	-
Plumbi et Opii	-	-	-	-	-	-	+	-	-	-
Glycerini	-	-	-	-	-	-	-	-	+	+

Suppositories of the U. S. P. 1820 to 1900.

The tabulation of the suppositories that have been official in the several editions of the U. S. P. reveals a rather peculiar state of affairs with regard to this mode of administration. From 1820 to 1860 inclusive, not one of the ten suppositories of the table had been given a place in the U. S. P. Then, in the last revision controlled by the medical profession, nine were introduced to disappear in 1880 when for the first time the pharmaceutical profession more or less managed the revision. Possibly they were dropped in accordance with the general policy to discard formulas for modes of administration (See revision circulars). However, in harmony with that inconsistency which has been so characteristic of the U. S. P. Revision Committee in the application of this principle, glycerin suppositories were made official in 1900.

Hirsch:Universal Pharmacopoe --Suppositories.

Suppositoria	Austr.	Belg.	Brit.	Gall.	Germ.	Germ. S.	Helv.	Hisp.	Ndl.	Norv.	Russ.	U.S.
Acidi Carbolici	-	-	+	-	-	-	-	-	-	-	-	-
Acidi Tannici	-	-	+	-	-	-	-	-	-	-	-	-
Aloes	-	+	-	+	-	-	+	-	-	-	-	-
Belladonnae	-	+	+	-	-	-	-	-	-	-	-	-
Glycerini	+	-	+	-	-	+	-	-	-	-	-	+
Iodoformi	-	-	+	-	-	-	-	-	-	-	-	-
Mellis	-	-	-	-	-	-	-	+	-	-	-	-
Mellis Composita	-	-	-	-	-	-	-	+	-	-	-	-
Morphinae	-	-	+	-	-	-	-	-	-	-	-	-
Olei Cacao	-	-	-	+	-	-	-	+	-	-	-	-
Plumbi Composita	-	-	+	-	-	-	-	+	-	-	-	-
Ratanhiae	-	-	-	+	-	-	-	+	-	-	-	-

Suppositories of the World's Pharmacopoeias.

The suppositories of the different pharmacopoeias of the world as tabulated by Hirsch in the Universal Pharmakopoee number in all just twelve,representing eight different countries.

The country having the greater number of official suppositories is Great Britian, leading the list with seven out of a total of twelve; Spain followed with five official; France three; Belguim two and Austria, Germany, Helvetia and the United States with but one each.

The most popular official suppository seems to be Suppositoria Glycerini being official in four countries, namely Austria, Britian, Germany and the United States.

Suppositories Aloes are official in Belgium,France and Switzerland and the remainder of the twelve listed in the preceding tabulation are official in the Latin countries of Europe.

From the table in Hirsch it would appear that as far as suppositories as a form of administrating medicaments are concerned they fail to be recognized very extensively in the official formularies and pharmacopoeias of the world.

Bakes, W. 1864.

Pharmaceutical Formulae.

Drug. Cir., 7, p. 106. [Am. Journ.Pharm.,35,p.228; Proc. A. Ph. A., 11, p. 70.]

The author describes a method for moulding suppositories and gives a list of ingredients, which he claims are capable of being administered in the form described.

Ellis, A. 1875.

A New Method of Making Suppositories, Medicated Pessaries and Bougies.

Ph. Journ., 34, p. 845. [Proc. A. Ph. A., p.93.]

The author claims hand manipulation is dirty and impracticable and gives a method for their preparation using paper cones as moulds.

Mattison, R. V. 1875.

On Suppositories.

Am.Journ.Pharm.,47, p.98. [Proc. A.Ph. A.,23,p.92.]

The author states his reasons why suppositories should be prepared by hand, relating in detail the methods employed by different druggists of note.

Reed, T. J. 1881.

Suppositories.

Drug. Cir., 25, p. 128. [A. Ph. A., 30, p. 112.]

The author gives directions for the technique to be employed in the preparation of suppositories.

When moulding is impracticable, he recommends the use of a mass made from

Glycer. Amyli.
Pulv. Saponis.
Pulv. Amyli. q.s.,

which can be worked like a pill mass.

Trippier. 1884.

Plastic Clay for Suppositories.

Am., Drug., 13, p.32. [Proc. A. Ph. A., 32, p.91.]

The author describes the use of plastic clay for suppository bases, pointing out the advantage of this medium when metallic salts are to be employed.

Hocking, F. A . and E. Brooke. 1890.

Suppositories.

Pharm. Journ., 49, p. 851. [Proc. A.Ph.A.,38,p.368]

The author reviews the history of suppositories in the British pharmacopoeia since 1864,their size, the methods of preparation (including moulds and hollow gelatine suppositories) and more particularly the fatty vehicles used in their preparation:

Oil of theobroma,
Kukum butter from Garcinia indica,
Minjak Tangawang,
Surang oil from Hopoea Muranto,
Myrtle wax from Myrica cordifolia,
Chinese vegetable tallow from Stillingia sebifera,
Shea butter from Bassia Parkin,
A mixture of glycerin and soap (2:1),
Gelatine base (gelatine, water, glycerin),
Soap and starch.

He also gives directions for the incorporation of the following medicaments:

Lead acetate,
Alum,
Atropine,
Boric acid,
Tannin,
Bismuth nitrate,
Zinc oxide,
Iodoform,
Ointment of mercury,
Extracts,
Lead acetate and opium,
Chloral hydrate,
Iodine,
Oleates of alkaloids,
Vegetable oils,
Beef peptone.

Morgan, H. F. 1890.

Glycerin Suppositories.

Pharm. Rec.,10,p.176. [Proc.A. Ph.A.,38,p.368.]

The author gives directions for a method for preparing glycerin suppositories,which is especially adapted to the prescription counter.

Archibald, H. C. 1891.

On the Preparation of Suppositories.

Am. Journ. Pharm.,63,p.90. [Proc. A.Ph.A.,39,p.327.]

The article discusses the author's suppository machines (which are illustrated) explaining improvements and manipulation of his more recent patents.

Hackenbeiger, Geo. W. 1892.

Suppositoria Glycerini.

Am. Journ. Pharm.,64,p.134. [Proc.A. Ph.A.,40,p.500.]

The author gives the methods and formulas for the preparation of 50 and 90 per cent glycerine suppositories.

Binder, E. 1893.

Glycerinsuppositorien mit Aloin,Citrullin und Colocynthin.

Pharm. Post,26,p.104. [Yearbook of Pharm.,30,p.219.]

Clinical experiments in rectal applications of aloin, colocynthin and citrullein by Kohlstock induced the author to place on the market the following suppositories:

Suppositoria Glycerini cum Aloino (cont. 0.5 g. of aloin pro dosi for mild constipation.)
Suppositoria Glycerini cum Colocynthino (cont. 0.03 g. pro dosi for aggravated constipation.)
Suppositoria Glycerini cum Citrullino (cont. 0.02 g. pro dosi for cases in which the above have failed.)

Remington, J. P. 1893.

On the Preparation of Glycerine Suppositories.

Am. Journ. Pharm.,64,p.457. [Y.B. of Pharm.,30,p.219.]

Referring to the difficulty in combining large quantities of glycerin in suppositories the author recommends the following formula:

Sod. Carbonate	40 gr.
Stearic acid	80 gr.
Glycerin	1,180 gr.

To make 12 suppositories.

Lomuller, E. 1895.

Glycerin Ovules and Suppositories.

Giornal di Farm. p, [Pharm. Journ.,55,p.182; Proc. A. Ph. A., p. 444.]

The author after pointing out the objections to the use of gelatin in glycerin suppositories, proposes the solidification of the glycerin by means of agar-agar. He also gives the formula with directions for their manufacture.

Ryan, F. G. 1895.

Agar-agar as a Base in Glycerin Suppositories.

Am.Journ. Ph.,67, p.599. [Year Book of Pharm.,33,p.173.]

The author found Lomuller's formula for glycerin suppositories with agar-agar to be too elastic and not firm enough for convenient introduction in to the rectum. The following formula gives a more satisfactory product.

Agar-agar 5 gms.
Distilled water 45 cc.
Glycerin 150 gms.

1900.

Suppositoria Glycerini.

Proc. A. Ph. A., 48, p. 517.

The formula of the Dresden Apothecaries' Society is as follows:

Cacao butter, 40 gm.
Spermaceti, 10 "
Glycerin, 25 "
Caster oil, 25 "

Mix and form suppositories weighing 2 gms. each.

1900.

Suppositoria Glycerini.

Proc. A. Ph. A., 48, p. 517.

The formula of the Dresden Apothecaries' Society is as follows:

Cacao butter,	40 gm.
Spermaceti,	10 "
Glycerin,	25 "
Caster oil,	25 "

Mix and form suppositories weighing 2 gms. each.

1903.

Suppositorien und Vaginalkugeln mit Capraol.

Pharm. Zeit.,48,p.816. [Yearbook of Pharm.,41,p.269.]

A purified odorless and tasteless cocoanut oil being suggested as a substitute for cacao butter as a basis for suppositories and pessaries.

1904.

Suppositorien gegen innere Haemorrhoiden.

Rev. Med. Pharm., p. 878. [Apoth. Zeit.,19,p.679; Yearbook of Pharm., 42, p. 284.]

The formula is given as follows:

Powd. Ext. of Hamamelis	1 gr.
Orthoform	5 grs.
Cocaine hydrochloride	½ gr.
Ext. of Belladonna	1/6 gr.
Ext. of opium	1/6 gr.
Cacao butter	60 gr.

Make one suppository;to be used night and morning.

1904.

Notes.

Proc. A.Ph. A.,52, p.253. [Yearbook of Pharm., 42, p. 385.]

The following base will give a suppository of witch-hazel and hydrastis without separation.

Caster oil 10, beeswax 15, cacao butter 90.

Grimbert, L. 1904.

Formules Novelles et Formules Modif Inscrites au Nouveau Codex.

Journal de Pharmacie et de Chimie,20, p. 152.

[Yearbook of Pharm., 42, p. 286; Ovules, p. 156; Ovules au tannin, p. 157.]

A formula for tannin suppositories as suggested for the new Codex is given:

Washed and dried gelatin 10, tannin 3,water 15, glycerin 60 parts by weight. Each suppository contains approximately 50 Cgm.

Lothian, John. 1904.

Notes and suggestions on the British Pharmacopoeia,1898.

Glycerin Suppositories.

Pharm.Journ.,72 ,p.583. [Proc. A.Ph. A.,52, p. 567.]

The author gives a simplification of method reducing the amount of water so as to procure the result originally contemplated by the official formula.

Scoville, W. S. 1904.

Wax in Suppositories.

Proc. A. Ph. A.,52,p. 219. [Yearbook of Pharm., 42, p. 384.]

The author prefers speramecti to wax as a means pf raising the melting point of suppositories.

1906.

Vorschriften fuer Rezeptur und Handverkauf:

Suppositoria Glycerini.

Pharm. Zeit., 51, p.30. [Proc. A. Ph. A.,56,p.122.]

A formula is given for the manufacture of suppositories using equal portions of oil of theobroma and glycerin with the addition of a small amount of anhydrous wool fat. The dimensions and weight of the product are also given.

Scatchard, E. E. 1906.

Glycerinated Gelatin Suppositories.

Am. Journ. Pharm.,78,p.419. [Proc.A.Ph.A.,55,p.691.]

The author gives directions for the preparation of glycerinated gelatine suppositories,which he regards as a practical addition to the U. S. P. (8th Rev.) process for the making of glycerinated gelatin.

1908.

Nouvelles Formules Pour la Preparation des Suppositories.

Journ. de Med. de Paris, p. [Nouveaux Remedes, 23, p. 403; Yearbook of Pharm., 45, p. 318.]

The author gives formulas for Suppositories a la glycerine (with stearin soap, also with gelatine), and Suppositories au chloral hydrate.

Doer, G. 1908.

Neue Methode zur Herstellung von Suppositorien.

Suedd. Apt. Ztg.,48, p. 794. [Schweiz. Woch.Chem. u. Pharm.,47, p. 135; Yearbook of Pharm.,46,p.171.]

The author bases his "new" method on the observation that if molten cacao butter is mixed with an equal part of solid cacao butter, the suppositories solidify readily. He coats the moulds with a film of soap spirit to faciliate the ready removal of the suppositories.

Schleimer, A. 1908.

Compressed Tablets and Suppositories.

Natl. Druggist, 39, p.54. [Yearbook of Pharm., 46, p. 171.]

The author regards the cold process for making suppositories vastly superior to the old process of heating and melting, giving his reasons and directions.

J. F. 1908.

Anusol Suppositories.

Pharm. Weekbl., p. [Apt. Ztg.,23,p.863; Yearbook of Pharm., 46, p. 132.]

The suppositories placed on the market by Goedecke & Co.,of Leipzig, which are supposed to contain iodoresorcinate of bismuth contain none. Neither is there any iodine or sulphonic body present. However, some resorcinol was found, also bismuth and zinc in the ash.

g, H. A. 1909.

Suppository Base.

Proc. A.Ph. A., 57, 1142. [Yearbook of Pharm.,47, p. 277.]

For summer use and where a large percentage of solid extracts are dispensed, a base consisting of cacao butter containing 10 p.c. caster oil and 2½ p. c. of white wax is better than cacao butter alone.

Adrenaline increases the resistance of suppositories and prevents its melting freely at body temperature.

Boas, J. 1910.

Ueber Naehrsuppositorien.

Berl. Klin. Woch.,47, p. 457. [Nouveaux Remedes , 27, p.29; Yearbook of Pharm., 48, p. 390.]

The author gives directions for size and composition of his nutritive suppositories.

Gelatin	1904	Grimbert
	1908	-
	1890-1900	U. S. P.
	1908	-
	1906	-
	1904	Lothean,J.
	1904	Grimbert.
	1890	Hocking & Brooke.
	1890	Morgan, H.F.
	1892	Hackenbeiger
	1893	Remington
	1895	Lomuller
	1895	Ryan,F.D.
	1900	-
Glycerite of Starch	1881	Reed.
Glycerinated Gelatin	1906	Scatchaed.
Hydrastis	1904	-
Iodine	1890	Hocking & Brooke.
	1908	Suyver, J.L.
Iodoform	1890	Hocking & Brooke.
Iodoresorcinate of Bismuth	1908	Suyver, J.F.
Kukum butter	1890	Hocking & Brooke.
Lead acetate	1890	Hocking & Brooke.
Machines	1891	Archibald, H.
Mercurial ointment	1890	Hocking & Brooke.
Minjak Tangawang	1890	Hocking & Brooke.
Morphine suppositories	1870	U. S. P.
Myrtle wax	1890	Hocking & Brooke.
Oil of Theobroma	1890	Hocking & Brooke
Oleates of Alkaloids	1890	Hocking & Brooke.
Opium	1890	Hocking & Brooke.
Opium suppositories	1870	U. S. P.
Orthoform	1904	-
Plumbi	1870	U. S. P.
Plumbi et opii	1870	U. S. P.
Resorcinol	1908	Suyver, J. F.

Shea butter	1890	Hocking & [illegible]
Sodium carbonate	1893	Renington, J.P.
Soap	1881	Reed.
	1890	Hocking & Brooke.
Soap Spirit	1908	Doer, C.
Spermaceti	1904	Scoville.
	1900	-
Starch	1881	Reed.
	1890	Hocking & Brooke.
Stearic soap	1908	-
Stearic acid	1893	Remington, J.P.
Surang oil	1890	Hocking & Brooke.
Tannin	1904	Gembert
Vegetable oils	1890	Hocking & Brooke.
Wax	1904	Scoville.
White wax	1904	Dunning,
Witch-Hazel	1904	-
Wool fat	1906	-
Zinc	1908	Suyver, J. F.
Zinc oxide	1890	Hocking & Brooke.

ACCEPTED

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