THE CHEMISTRY OF COLD CREAMS.

H. S. GROAT.

There has always been a noticeable difference between cold creams made with, and those made without, borax. Those made with borax are always whiter and fluffier, and seemingly not as greasy as the others, due to the uniting of the borax chemically with the palmate, stearate, or fatty alcohol of the hard and soft bases. This reaction only takes place when the oil solutions and the aqueous solution of borax are both heated to above 120 degrees F., as the esters or organic borates are not formed below that temperature.

When spermaceti is used as the base in the manufacture of the cold cream, borax unites chemically with cetin its chief constituent in a reaction similar to the reaction of borax and glycerin in the manufacture of boroglycerin. In a similar manner borax reacts with myricylic palmate and ricinolein, the chief constituents of white wax and castor oil respectively, when either white wax or castor oil is used as the principal base. With almond oil as a base borax acts likewise with the three main constituents of almond oil, palmitin-myricyl palmitate, olein-glyceride of oleic acid, and stearin-glyceride of stearic acid.

When glycerine and borax are heated together, the chemical result is boroglycerin, sodium meta borate and boric acid, or meta boric acid and water.

$C_3H_5(OH)_3 + Na_2B_4O_7 = (C_3H_5)BO_3 + 2NaBO_2 + H_3BO_3$

Glycerine Borax Boroglycerin Sodium metaborate Boric acid or

$(H_2O + HBO_2)$

Water Metaboric acid.

Take the following common formula for cold cream:

Petrolatum Liquidum	120
Cera Alba	40
Aqua	40
Sod. Bibor	1.4

Here we have white wax as the hard base, its chief constituent myricyl palmate, being attacked by the borax forming palmitic borate.

$3C_{16}H_{31}O.OC_{30}H_{61} + Na_2B_4O_7 + 3H_2O = (C_{16}H_{31})_3BO_3 + 2NaBO_2 +$

Myricylic Palmate Borax Water Palmitic borate Sodium metaborate

$3HO.OC_{30}H_{61} + H_3BO_3$ or $(H_2O\ HBO_2)$

Myricylic acid Boric acid or water and Metaboric acid.

Another common formula is:—

Oleum Ricini	180
Cetaceum	60
Cera Alba	15
Sodium Biborate	1.5
Oleum Rosæ.	
Oleum Amygdalæ Amaræ aa q. s.	

In this case the borax enters into three separate chemical reactions with the white wax, spermaceti, and castor oil respectively. We have given above the

reaction of borax with white wax, we shall now take up the reaction of borax with spermaceti. The chief constituent of spermaceti is cetin-cetyl palmitate—$3C_{16}H_{33}O.OC_{16}H_{31}$—which is attacked by the borax forming palmitic borate, as in the case of white wax and cetylic acid as a by-product instead of the myricylic acid, which is the by-product when white wax is used.

$$3C_{16}H_{33}O.OC_{16}H_{31} + Na_2B_4O_7 + 3H_2O = (C_{16}H_{31})_3BO_3 + 2NaBO_2 +$$

Cetyl palmitate Borax Water Palmitic Borate Sodium Metaborate

$$3HO.OC_{16}H_{33} + H_3BO_3 — (H_2O+HBO_2)$$

Cetylic Acid Boric Acid or Water and Metaboric Acid.

With the castor oil, borax combines with its chief constituent ricinolin-glycerine of ricinoleic acid, and forms glyceryl borate or boroglycerin, ricinoleic acid, sodium metaborate, and boric acid or water and metaboric acid.

$$C_3H_5(C_{18}H_{33}O_3)_3 + Na_2B_4O_7 + 3H_2O = (C_3H_5)BO_3 + 2NaBO_3 +$$

Ricinolein Borax Water Boroglycerin Sodium metaborate

$$3HOOC_{18}H_{33}O + H_3BO_3 — (H_2O + HBO_2)$$

Ricinoleic Acid and Boric Acid or Water and metaboric acid.

There is another and more popular class of cold creams, of which almond oil is the base. The extreme popularity of these creams is due to the fact that the use of almond oil as the base is a decided advantage, as it is of a purely endermatic nature, that characteristic so greatly desired in this class of toilet preparations. Of the many formulæ of this class tried out the following gives the most universal satisfaction:—

Oleum Amygdalæ Dulcis	77
Lanum	15
Paraffinum	18
Cera Alba	18
Sod. Bibor	1.5
Liq. Hydrog. Diox	1.5
Oleum Rosæ Geranium	.2
Aqua Dist	27
Oleum Rosæ	.4

With the almond oil the borax enters into a triple chemical reaction with its chief constituents, the glycerides olein, palmitin, and stearin. Glyceryl borate or boroglycerin is the resulting chemical compound formed in each case. With olein, which is a glyceride of oleic acid, the reaction is

$$C_3H_5(O.OC_{18}H_{33})_3 + Na_2B_4O_7 + 3H_2O = (C_3H_5)BO_3 + 3HO.OCC_{17}H_{33}$$

Olein Borax Water Boroglycerin Oleic acid

$$+2NaBO_2 + H_3BO_3 — (H_2O + HBO_2)$$

Sodium metaborate and boric acid or Water and metaboric acid.

With palmitin the reaction is

$$C_3H_5(O.OC_{16}H_{31})_3 + Na_2B_4O_7 + 3H_2O = (C_3H_5)BO_3 + HO.OCC_{15}H_{31} +$$

Palmitin Borax Water Boroglycerin Palmitic acid

$$2NaBO_2 + H_3BO_3 — (H_2O + HBO_2)$$

Sodium metaborate and boric acid or Water and metaboric acid.

With stearin the reaction is

$C_3H_5(O.OC.C_{17}H_{35})_3 + Na_2B_4O_7 + 3H_2O = (C_3H_5)BO_3 + 3HO.OCC_{17}H_{35} +$
Stearin Borax Water Boroglycerin Stearic acid

$2NaBO_2 + H_3BO_3 - (H_2O + HBO_2)$
Sodium metaborate and boric acid or Water and metaboric acid.

Mr. Ford read the following paper:—

RANDOM NOTES.

THOMAS D. MCELHENIE, PH. G.

Aqua Anethi:—Wishing to replenish a supply of Aqua Anethi I could find no formula except the British on Page 174, U. S. Disp., 19th Ed.—directing distillation. Not having the necessary apparatus or time, I adapted to the case the official process for most of the aromatic waters, as follows:—

℞	Ol. Carui	2 cc.
	Ol. Anethi Sem	2 cc.
	Talcum	30 gm.
	Water ad	2000 cc.

Triturate and filter as usual.

The product is entirely satisfactory.

Blue Pills.—For several years my habit has been to dispense for Blue Pills over the counter five-grain Capsules of Powdered Blue Mass, and the patient gets a better thing than ready-made pills whether made by myself or a factory.

(Capsulæ Blaudii C. Arsenici et Strychnia):—The official process for the Pill of Ferrous Carbonate and the processes of the various makers who furnish the pills ready-made, do not and cannot produce a pill of *ferrous* carbonate. By the time the work is done the moisture present has changed nearly or quite all of the salt to the *ferric* salt. Pondering these things, I hit on the plan of using the essential ingredients dried, and packing speedily into capsules.

Starting with a warm mortar of good size, drop in the necessary dispensary tablets, for one grain each Arsenious Acid and Strychnia Sulphate and follow with Potass. Carb. Purif. Recentis 250 grains. Rub to fine powder and add Ferri Sulph. Exsicc. 250 grains in fine powder. Rub lightly enough to mix well and pack into No. 4 Capsules, which will hold five grains. Keep in corked bottles. These will produce *Nascent ferrous Carbonate* in the stomach at the time of disintegration. I have some of the capsules several months old unchanged.

Preparation of Herbs, etc.:—To prepare leaves or herbs for maceration or percolation moisten the material with water in a suitable basin and cover, allowing to stand over night so that the leaf is in about the natural fresh condition. Then when the worshipful mistress of Domestic Lodge No. 1 is not looking, borrow her meat chopper, sneak back to the store and in a little while you have your leaves coarsely cut. Allow them to dry and proceed with the operation.

I have prepared Jaborandi and Henna in this way and for many others it would work equally well. Our distinguished member, Mr. Ebert, years ago proposed the same little tool for granulating Opium.

Elix. Aromaticum:—Four years of continuous use of the formula of Mr. R. R.

Johnston of Bucyrus, Ohio, for this elixir only confirms my good opinion. It contains 6¼% Alcohol, and that is enough for any use I can think of. The formula was published in the Pharm. Era, May 20, 1909, P. 469. As it was not mentioned in the Report on Progress of Pharmacy for 1909 or 1910. I conclude some members may have missed it, and therefore will transcribe it here.

℞ Sp. Aurantii Co	12.	cc.
Talcum Purif	30.	gm.

Triturate thoroughly and add in portions

Syrup	363	cc.

Add gradually in same manner

Glycerine	93.7	cc.
Alcohol	62.5	"
Water	468.7	"

Filter through wetted filter and follow with mixture of

Alcohol	10%	by vol.
Glycerine	15%	by vol.
Water	75%	by vol.

to make 1000 cc.

After two or three trials I have found it to be improved by using about 20% of Concent. Syr. Orange in place of so much Simple Syrup.

Worked out for five gallons it runs as follows:—

Sp. Aurantii Co	240 cc.	240 cc.
Talcum	600 gm.	600 grams
Syr. Orange Conc	51 fl. oz.	1452 cc.
Syrup	195 " "	5808 cc.
Glycerine	64 " "	1875 cc.
Alcohol	42 " "	1250 cc.
Water ..... ad. Cong. V		qs. ad. 20,000 cc.

Lin. Camphora Benzoata:—To an educated nose a sniff at the mouth of a bottle of a perfectly normal academic and official liniment of Camphor brings to one's mind just a trace of an odor which resembles the first cousin of rancidity. I have had in mind for a long time to try benzoin for that and having occasion recently to make up 2000 cc., I added 2% of Siam Benzoin.

Following the suggestion made by Mr. Raubenheimer a few years ago I used Oleum Sesami weighing 1600 grams into a tared bottle, and dropping in 400 grams of coarsely powdered Camphor and indicating by a strip label the measure of 2000 grams, then adding 40 grams coarsely powdered Siam Benzoin and allowing to stand until wanted, when it was filtered, and furnished a fine product. Camphor dissolving more rapidly than in Ol. Gossypii.

Mr. Nitardy moved that the papers presented by authors not present be declared as read and referred for publication. Motion carried.

Mr. Osseward was then installed as Chairman of the Section and made the following address:—

"I will say to you gentlemen that I deem it an honor to be selected as Chairman, as I told one of the gentlemen who asked me about this nomination, that I had my mind made up

when I came to Detroit that I would not accept an office of any kind. He wanted to know why, and I said because I have so much business in my own State that I do not see how I can do justice to the work. I think the members of the Association should be a little more lenient with the Chairman, as it is hard work to get papers as it means a lot of worry, and if the worry was taken away it would be a pleasure. I am going to try to see if I cannot get a little assistance from the start so that a little worry can be taken off my mind, and if that can be done I think the work will be pleasure instead of a pressure, because the Chairman has to work very hard. I put out 200 invitations for papers and received three replies. I trust that some of the members will make promise of a paper. I will do everything I can to make this Section a success next year.

Mr. Osseward then introduced Mr. Becker as Secretary.

Mr. Becker spoke as follows:

I feel that a few words in defense of my position is necessary. I came here also with the intention of not taking an official connection with any of the Section. The principal reason for my not wanting to serve, was because I feel that my services are very inadequate because of the very poor results obtained from my efforts. I do not conduct successfully the section of work assigned to me. In regard to papers, I think that one plea is sufficient for a gentleman. I will try to do the best I can as Secretary.

Mr. Osseward then introduced Mr. Jones as Associate.

MR. JONES:—I do not know that I can be of any service to the officers of this Section, and I do not know what you intend that I should do, but I do consider it an honor to be appointed as Associate to such worthy gentlemen as Mr. Osseward and Mr. Becker.

MR. NITARDY:—The Associate is the apprentice and the object is that he will become acquainted with every part of the work so that when he becomes Secretary he will make an energetic, hard-working Secretary and later when he becomes Chairman, he will make a hard-working and energetic Chairman.

MR. WILBERT:—I move a hearty vote of thanks to ex-Chairman Nitardy.

Motion approved by rising vote.

Motion to adjourn. Carried. C. OSSEWARD, Secretary.

ON THE PREPARATION OF FLAKE AGAR-AGAR.

F. W. NITARDY, PH. C.

Agar-agar has recently come into favor with the medical profession as an evacuant. Its value is based on the formation of a soft, bulky indigestible jelly in the intestines, which, it is claimed, promotes peristalsis by supplying the necessary residue frequently lacking on account of our present-day highly refined foods, and softens the feces by virtue of its water absorbing and holding power.

In its natural form agar-agar is hardly available for this purpose as the long shreds are difficult to administer. The powdered agar-agar, it is claimed, will be digested when taken. Its most desirable form for administration is therefor in flakes, in appearance quite similar to flake breakfast foods and usually prescribed to be eaten with or as such cereals.

A simple and easy method of preparation is as follows:

Soak and rinse a suitable quantity of agar-agar in water, drain well, grind through a meat-chopper and spread out in thin layers on cheese-cloth trays to dry in a dust-free airy place. When dry collect and store in suitable vessels. This product is usually prescribed in doses of one to four heaping teaspoonfuls (1 to 4 gm.).

If it is desired to medicate the agar-agar, the required amount of medicament for each 500 gm. is dissolved in water so as to form 1000 cc. of solution. This solution is mixed with the flake agar-agar and as soon as it is evenly and completely absorbed, the product is again spread out to dry.