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Original and Selected Papers.

THE TINCTURES AND WINES OF THE BRITISH PHARMACOPŒIA*

BY W. W. STODDARD AND R. L. TUCKER.

The solutions which we call by the doubtful appellation of "tinctures," form no insignificant item in the stock of a pharmaceutist. They have repeatedly been the subject of comment, and an apology is probably necessary for bringing them forward in the present paper. Why are they introduced into our Materia Medica? Is it because they are used by the physician as mere flavoring or preservative ingredients in their prescriptions? Or is it because they are really valuable and true solutions of active principles of plants, and having specific powers as medicinal agents? We think the latter to be the case, and have tried to find out the most exhaustive method of preparation, and for the elimination of a product similar in all respects to that of the recognized Pharmacopœia.

The following notes are the results of an extensive series of analyses and experiments made for the attainment of this object.

Some prefer the old process of maceration, others the more

*Read before the British Pharmaceutical Conference, 1872, and published in the Pharmaceutical Journal and Transactions.

recent one of percolation, while the compilers of the present pharmacopœia generally recommend a quasi combination of both.

At our first meeting at Bath, a very interesting paper was read by Mr. Savage on some of the tinctures of the last edition of the Pharmacopœia, and a table of results appended. His plan of examination seemed good in many respects, and we have have taken it as our guide in compiling a complete epitome of the tinctures and wines, each of which has, with few exceptions, been prepared in three ways for the purpose of comparison, viz.:—

1. By the maceration (marked in the table M.)
2. By the Pharmacopœia formula (marked P.)
3. By the same, as modified by the authors (marked S.)

They have all been made with the greatest and most scrupulous care, and the sp. grav. of the spirit or wine ascertained and adjusted before being used.

There are 65 tinctures and 10 wines ordered in the Pharmacopœia; of these 10 are simple solutions, 24 are prepared by maceration, and 40 by a combination of maceration and so called percolation. Our table gives the results of an examination of all, except 26, which have no relation to the methods in question, and is arranged in columns in the following manner:—

1. The method of preparation employed.
2. The weight per ounce of ingredients ordered.
3. The sp. grav. of solvent.
4. The sp. grav. of the resulting tincture.
5. The total contents, per ounce, of the tincture.
6. The percentage of ingredients dissolved.

Preparation by maceration.—This is the oldest process and consists in bruising or coarsely powdering certain roots, barks, seeds, etc., and placing them in spirit or other menstruum for a specified time. After the time for maceration has elapsed, the fluid is strained off, and the remainder submitted to the action of a powerful press. Filtration completes the process.

Many persons still strongly advocate maceration, because it gives tolerably uniform results which they cannot so easily obtain by other means. The objections are the length of time required, the great waste from evaporation, and the marc left in the press being still rich in active principles. It is in our opinion the last method that ought to be adopted by the careful and economically inclined pharmacist for the perfect extraction of the soluble matter of any herb or plant. There have been many suggestions for improving the process and saving the time, such, for instance, as that recommended by Dr. Burton, where the ingredients were suspended in the upper part of the solvent. The spirit, as it becomes saturated, and therefore of greater density, falls to the bottom of the vessel, its place

being taken by more spirit, to be in its turn saturated and deposited. By this means exhaustion is attained with considerable rapidity and saving more than half the time.

Preparation by percolation.—This method is comparatively a recent one, and was introduced some years ago and strongly recommended by our friend Mr. Deane. When properly conducted, there is no doubt that percolation is of all methods the most perfect, and accompanied by the least waste. The resulting tincture is ready for use, quite bright, and independent of the press and filtering paper.

Probably why percolation is not more generally in use is on account of the difficulty attendant on "packing." A satisfactory percolation can only be performed by an absolutely perfect and uniform arrangement of the ingredients, and which is often an impossibility. It is imperative that the spirits should pass through equally and horizontally, or else one portion would permeate much faster than another. Each layer of the solvent as it passes downward should be *displaced* by a fresh one, but a *mixture* of the two should not be allowed, which would entirely alter the *modus operandi* of the whole process.

Tincture making is generally placed in the hands of the apprentice or junior assistant, and of course a want of experience only makes matters still worse. The consequence is that the proprietor of the establishment is startled at the thin bodied laudanum, the washy tincture of gentian, or the tasteless Vin. Ipecac.

It is surprising how constantly the meaning of the word percolation is misunderstood. It is so in the Pharmacopœia itself; for instance, in the directions for making Tinct. Chiratæ, Capsici, Colchici, Conii, Gentianæ, etc., what is there by inference termed percolation is not percolation but simply washing, and a large waste of spirit unnecessarily entailed. To obviate this waste is the object of our experiments, and of the process which we now recommend, the adoption of which an experience of twenty years will fully justify. There are two essentials for success in the operation, namely, the *proper form of percolator*; and secondly (strange as it may seem), *no direct packing*.

The form of percolator.—These are sold of every possible variety, according to the fancy of the manufacturer, but all are referable to two kinds, cylindrical and conical. Repeated trials have proved that the perfect cylinder is the only one on which dependence can be placed. A little reflection will at once point out the error of recommending the conical form. The well-known laws of hydrodynamics show that the pressure of a column of fluid on the bottom of a containing vessel is invariably equal to the weight pressing on the area of the base. It will, therefore, be evident that a percolator having the form of an inverted cone, must have an unequal pressure from the contained fluid, and, as a consequence, the materials being exposed to an unequal pressure, must be unequally exhausted. The

fluid will pass most rapidly through those parts where the force from behind is the greatest.

Lateral pressure also causes a diagonal current in the direction of the central column, and exercising a considerable mixing force, which is of the greatest consequence when water is employed to displace spirit. Instead of true displacement, a combination of the two fluids will take place, and very much heighten the specific gravity of the tincture.

Professor Redwood alluded to this fact when he said :—" The conical form is most used, because the liquid aggregates toward the middle of the column, so that near the bottom more liquid runs than at the side * * * *spirit not to be driven out with water because it mixes.*

Our experiments, as detailed in the accompanying table, prove, we think, that the Professor's warning may be rendered unnecessary. We also differ from the opinion of Dr. Burton,* when he affirmed that percolation is more expensive, more difficult, and less generally applicable than maceration. Our investigations and general practice prove just the contrary, and show, that with the exception of Tinct. Limonis (when fresh peel is ordered), percolation is by far the best and most economical method of preparing the tinctures and wines.

The most satisfactory work was done when the percolator had a diameter of about one fourth the length, and when the ingredients, occupied one-fourth the interior.

Spontaneous packing.—As we before mentioned, any one who has worked much in the tincture department must be aware of the almost total impossibility of so regularly placing the ingredients with the requisite uniformity. The method which we venture to recommend is to allow the ingredients to *pack themselves*, and we think that so great a simplicity and completeness are attained that the veriest tyro may be entrusted with the operation without the risk of failure. Our mode of procedure is to powder the ingredients and pass them through a sieve having from 20 to 30 apertures to the inch, and put into the *whole of the spirit*, and macerate for 48 hours with occasional agitation. At the expiration of time the supernatant spirit is poured off, the dregs stirred up and poured into the cylindrical percolator, and allowed to drop until the liquid passes away clear and bright. It is then placed in the receiver, and all the spirit gradually poured on and allowed to percolate in the usual way. When all has passed through, an equivalent proportion of water is carefully poured on the residue to displace the spirit absorbed. If properly conducted, the water will not mix with the spirit, but, by its gravitating force, will drive it forward. The process thus proceeds with great uniformity, and the materials are perfectly exhausted. No waste is incurred, and the tincture is made with a rapidity equal to

*Pharm. Jour. 5, 1845.

the method of Dr. Burton, identical with that of the Pharmacopœia, and without the necessity of using the extra quantity of spirits, or the aid of pressure. We give two examples to explain more fully our mode of procedure; one where there is an excess of material to the spirit, and another where the quantity of spirit is greatly in excess of the materials. To exemplify the first we would instance Tinct. Zingib. fort.

Four pounds of ginger are stirred up with one gallon of rectified spirit and left for 48 hours. The supernatant spirit is put aside, and the deposit poured into the percolator. As soon as the tincture passes through bright, which it does in the course of three or four minutes, the percolator is placed in the stand, and allowed to stay till all the spirit has been poured on. In this case 88 ounces will have passed through, while 72 will have been absorbed by the ginger. A considerable quantity of water is then gently poured on the top of the ginger, and allowed to displace the spirit till the gallon of tincture is obtained. If only a few drops more are allowed to go through, the resin will be deposited, showing that the water has made its appearance.

For the second instance let us take Tinct. Colchici sem. Two and a half pounds of the powdered seeds are mixed with two gallons of proof spirit and allowed to macerate for 48 hours. The supernatant liquid is then poured off, and the dregs placed in the percolator as before described, and the spirit displaced by water. With this quantity 32 ounces will have been absorbed by the seeds.

It will thus be seen that we dispense with the use of the press or the extra quantity of spirit by allowing the ingredients to settle spontaneously, or, in other words, to *pack themselves*.

To show you that such is the case, Mr. Tucker and I have made nearly all the tinctures and wines of the Pharmacopœia, and drawn up the following table of results. The only ones omitted are the following 26, because they have no relation to the point at issue.

Tinct. Aloes	Tinct. Kino
" Assafœtidæ	" Limonis
" Benz. Co.	" Myrrhæ
" Camph. Co.	" Opii Am.
" Cannab Ind.	" Quiniæ
" Cantharid.	" Tolut
" Castorei	Vin Aloes
" Chlorof. Co.	" Antim
" Cocci	" Aurant
" Ferri Acet.	" Ferri
" Ferri perchlor	" Ferri Citrat.
" Guaiaci Am.	" Opii
" Iodi	" Quiniæ

No.	Name.	Method.	Grs. per oz. of ingred. used.	Sp. grav. of solvent	Sp. grav. of Tinct.	Tot'l content per oz. in grains.	Per cent. of ingred. dissolved.
1	Tinct. Aconiti	M	54.68	.838	.8480	6.30	11.5
2	" "	P	54.68	.838	.8619	7.22	13.2
3	" "	S	54.68	.838	.8620	7.26	13.2
4	" Arnicæ	M	21.87	.838	.8460	3.80	17.3
5	" "	P	21.87	.838	.8557	4.61	21.0
6	" "	S	21.87	.838	.8560	4.84	22.1
7	" Aurantii	M	43.75	.920	.9380	14.50	33.1
8	" "	S	43.75	.920	.9410	17.00	38.8
9	" Belladonnæ	M	21.87	.920	.9300	6.62	30.2
10	" "	P	21.87	.920	.9285	6.29	28.7
11	" "	S	21.87	.920	.9290	5.65	25.8
12	" Buchu	M	54.68	.920	.9320	10.39	19.0
13	" "	P	54.68	.920	.9323	10.50	19.2
14	" "	S	54.68	.920	.9340	10.53	19.2
15	" Calumbæ	M	54.68	.920	.9320	7.08	12.9
16	" "	P	54.68	.920	.9389	8.10	14.8
17	" "	S	54.68	.920	.9390	8.13	14.8
18	" Capsici	M	16.40	.838	.8428	6.31	38.4
19	" "	P	16.40	.838	.8429	6.32	38.5
20	" "	S	16.40	.838	.8431	6.56	40.0
21	" Card. Co.	M	68.62	.920	.9552	30.40	44.3
22	" "	P	68.62	.920	.9550	29.11	42.4
23	" "	S	68.62	.920	.9530	28.54	41.6
24	" Cascarillæ	M	54.68	.920	.9277	8.33	15.2
25	" "	P	54.68	.920	.9298	10.75	19.6
26	" "	S	54.68	.920	.9305	10.87	19.9
27	" Catechu	M	76.56	.920	.9649	43.52	56.8
28	" "	S	76.56	.920	.9700	46.98	67.3
29	" Chiratæ	M	54.68	.920	.9274	4.84	8.8
30	" "	P	54.68	.920	.9278	5.83	10.6
31	" "	S	54.68	.920	.9280	5.99	10.9
32	" Cinch. Co.	M	81.00	.920	.9402	20.99	25.9
33	" "	P	81.00	.920	.9414	21.19	26.1
34	" "	S	81.00	.920	.9423	21.20	26.1
35	" Cinch. flav.	M	87.50	.920	.9383	16.13	18.2
36	" "	P	87.50	.920	.9387	16.19	18.5
37	" "	S	87.50	.920	.9441	16.18	18.2
38	" Cinnam	M	54.68	.920	.9306	8.98	16.6
39	" "	P	54.68	.920	.9307	8.99	16.4
40	" "	S	54.68	.920	.9308	8.96	16.4
41	" Colch. Sem.	M	54.68	.920	.9263	5.11	9.3
42	" "	P	54.68	.920	.9284	5.34	9.7
43	" "	S	54.68	.920	.9305	5.36	9.8
44	" Conii	M	54.68	.920	.9260	5.63	10.3
45	" "	P	54.68	.920	.9280	6.33	11.0
46	" "	S	54.68	.920	.9285	6.45	11.8
47	" Croci	M	21.87	.920	.9259	10.99	50.2
48	" "	P	21.87	.920	.9281	15.08	68.9
49	" "	S	21.87	.920	.9312	18.47	84.4
50	" Cubebæ	M	54.68	.838	.8448	10.10	18.5
51	" "	P	54.68	.838	.8454	10.54	19.2

No.	Name.	Method.	Grs. per oz. of ingred. used.	Sp. grav. of solvent.	Sp. grav. of Tinct.	Tot'l content per oz. in grains.	Per cent. of ingred. dissolved.
52	" Cubebæ	S	54.68	.838	.8460	10.65	19.4
53	" Digitalis	M	54.68	.920	.9375	8.98	16.4
54	" "	P	54.68	.920	.9372	8.42	15.4
55	" "	S	54.68	.920	.9389	8.36	15.2
56	" Ergotæ	M	109.37	.920	.9367	16.44	15.0
57	" "	P	109.37	.920	.9366	16.27	14.9
58	" "	S	109.37	.920	.9366	16.89	15.4
59	" Gallæ	M	54.68	.920	.9658	41.74	76.3
60	" "	P	54.68	.920	.9632	36.13	66.0
61	" "	S	54.68	.920	.9605	35.93	65.6
62	" Gent. Co.	M	60.15	.920	.9430	23.70	39.4
63	" "	P	60.15	.920	.9436	25.79	42.8
64	" "	S	60.15	.920	.9438	25.85	42.9
65	" Hyoscy.	M	54.68	.920	.9290	15.30	27.9
66	" "	P	54.68	.920	.9320	24.61	45.0
67	" "	S	54.68	.920	.9323	24.97	45.6
68	" Jalapæ	M	54.68	.920	.9323	18.20	33.2
69	" "	P	54.68	.920	.9324	18.24	33.3
70	" "	S	54.68	.920	.9382	18.24	33.3
71	" Kramer	M	54.68	.920	.9340	17.56	32.1
72	" "	P	54.68	.920	.9371	17.88	32.6
73	" "	S	54.68	.920	.9393	17.96	32.8
74	" Lavand Co.	M	15.00	.838	.8395	6.57	43.8
75	" "	S	15.00	.838	.8415	6.38	42.5
76	" Lobeliæ	M	54.68	.920	.9286	12.16	22.2
77	" "	P	54.68	.920	.9325	13.31	24.3
78	" "	S	54.68	.920	.9333	13.40	24.5
79	" Lobel Æth	M	54.68	.809	.8270	7.06	12.9
80	" "	S	54.68	.809	.8278	8.43	15.4
81	" Lupuli	M	54.68	.920	.9320	12.94	23.6
82	" "	P	54.68	.920	.9320	13.71	25.0
83	" "	S	54.68	.920	.9295	13.72	25.0
84	" Nuc. Vom.	M	43.75	.838	.8390	6.00	13.7
85	" "	P	43.75	.838	.8391	6.45	14.7
86	" "	S	43.75	.838	.8452	6.49	14.8
87	" Opii	M	32.81	.920	.9323	20.36	62.0
88	" "	S	32.81	.920	.9325	20.90	63.6
89	" Pyrethri	M	87.50	.838	.8391	4.60	5.2
90	" "	P	87.50	.838	.8416	4.77	5.4
91	" "	S	87.50	.838	.8420	4.78	5.4
92	" Quassiæ	M	16.40	.920	.9276	1.06	6.5
93	" "	S	16.40	.920	.9277	1.07	6.5
94	" Rhei	M	60.15	.920	.9390	26.33	43.7
95	" "	P	60.15	.920	.9392	28.86	47.9
96	" "	S	60.15	.920	.9386	29.01	48.2
97	" Sabinæ	M	54.68	.920	.9890	12.94	23.6
98	" "	P	54.68	.920	.9891	12.81	23.4
99	" "	S	54.68	.920	.9896	12.87	23.5
100	" Scillæ	M	54.68	.920	.9516	43.02	78.6
101	" "	P	54.68	.920	.9571	48.72	89.1
102	" "	S	54.68	.920	.9680	48.80	89.2

No.	Name.	Method.	Grs. per oz. of ingred. used.	Sp. grav. of solvent.	Sp. grav. of Tinct.	Tot'l content per oz. in grains.	Per cent. of ingred. dissolved.
103	Tinct. Ser egæ	M	54.68	.920	.9351	18.05	33.0
104	" "	P	54.68	.920	.9353	18.28	33.3
105	" "	S	54.68	.920	.9356	18.26	33.3
106	" Sennæ	M	120.31	.920	.9616	41.47	34.4
107	" "	P	120.31	.920	.9603	40.41	33.5
108	" "	S	120.31	.920	.9670	40.65	33.7
109	" Serpent	M	54.68	.920	.9233	6.00	10.9
110	" "	P	54.68	.920	.9239	6 57	12.0
111	" "	S	54.68	.920	.9241	6.57	12.0
112	" Stramonii	M	54.68	.920	.9317	2.86	5.0
113	" "	P	54.68	.920	.9318	2.89	5.1
114	" "	S	54.68	.920	.9318	2.89	5.1
115	" Sumbul	M	54.68	.920	.9246	16.25	29.7
116	" "	P	54.68	.920	.9248	16.48	30.1
117	" "	S	54.68	.920	.9243	15.70	28.7
118	" Valerian	M	54.68	.920	.9205	5.1	9.3
119	" "	P	54.68	.920	.9215	6.1	11.1
120	" "	S	54.68	.920	.9250	6.3	11.5
121	" Valer Co.	M	54.68	.870	.9000	5.03	9.1
122	" "	S	54.68	.870	.9064	6.16	11.2
123	" Verat. Virid	M	87.50	.838	.8524	11.56	13.3
124	" "	P	87.50	.838	.8527	12.72	14.5
125	" "	S	87.50	.838	.8624	13.9	15.8
126	" Zingiber	M	54.68	.838	.8425	2.17	3.9
127	" "	P	54.68	.838	.8426	2.18	3.9
128	" "	S	54.68	.838	.8428	2.21	4.0
129	" Zingib. fort.	P	218.75	.838	.8530	9.09	4.1
130	" "	S	218.75	.838	.8533	9.14	4.1
131	Vin. Colchici	M	87.50	.988	1.0033	*38.04	24.1
132	" "	S	87.50	.988	1.0050	39.10	25.3
133	" Ipecac	M	21.87	.988	.9946	26.16	42.1
134	" "	S	21.87	.988	.9970	26.95	45.7
135	" Rhei	M	35.81	.988	1.0176	38.62	60.5
136	" "	S	35.81	.988	1.0212	41.65	68.9
137	" Xericum			.988		16.95	

All the experiments were conducted in the following manner;—The sp. grav. were taken by the ordinary bottle, or by Regnault's modification, or by Mohr's hydrostatic balance. The evaporation was first conducted in a Griffin's hot air bath at a temperature which never exceeded 212° F. till a soft extract was obtained. The capsule was then removed and placed on an air-pump over sulphuric acid, and dried *in vacuo* till no further loss was sustained, and instantly weighed by an Ortling balance. This method was thought perferable to that employed by Mr. Savage on a sand-bath, or that recommended by Dr. Burton, which was at the temperature of 230°

* These determinations include the total contents per ounce of the wine.

in an American oven. For, in many instances, it was found that partial decomposition was produced before complete desiccation.

To measure the tincture for evaporation a cylindrical narrow measure was first used, but the measurement was not found to be sufficiently accurate for comparison where the difference was small.

A narrow glass tube graduated into one-fiftieth cubic inch was substituted, and found to give a satisfactory and uniform result.

Before commencing, the sp. grav. of the proof and rectified spirits were carefully adjusted to 920° and 838°. The ingredients were weighed and sifted. The proper quantity for half a pint of each tincture was taken and placed in a stoppered bottle with the proof, rectified or ammoniated spirit, as the case may be. One lot was allowed to macerate for seven days, and the other for 48 hours, preparatory to percolation. When the tinctures were finished the sp. grav. were taken, and a fluid ounce evaporated.

Mr. Haselden: I have listened with attention and great satisfaction to this paper. I admire very much Mr. Stoddart's patience and ingenuity in carrying out this matter. At the same time it is gratifying to me to hear what he has said, because I have myself come to the same conclusion that the cylindrical is the best form for percolators. You will perhaps remember that in 1864, soon after the appearance of the first British Pharmacopœia, I exhibited at Bloomsbury Square an apparatus which I had had made in order to carry out the Pharmacopœia process of maceration and percolation; and this percolator and macerator was cylindrical. The only objection made to it at the time was that it was rather large (holding four gallons) and that it was expensive. The percolator has rests inside it for fixing a diaphragm about one-sixth of its length from the bottom. When the ingredients are large in quantity I use the diaphragm and allow the liquor to pass through, having liquid above and below the ingredients. When I do not think proper to use the diaphragm there, the quantity being small, I have a perforated plate, which covers over the opening of the percolator, which opening is connected with a tap, so that I can turn off or on at will. In using this vessel there is no necessity for another vessel in which to macerate the ingredients with the spirit first of all, and certainly there is no waste in transferring from one vessel to another. I put the ingredients in as Mr. Stoddart directs, and pour upon them the quantity of spirit. I allow them to macerate until all the material is well acted on by the spirit. I then well stir it up, and allow it to settle and pack itself down just as Mr. Stoddard has described. After a certain number of hours (say 24) I turn on the tap very gently and allow the percolation to commence. In that way I always get satisfactory preparations. Towards the end of the process (perhaps this may be superfluous) before I displace the spirit that remains, I take the precaution to press the ingredients to pack

them down more. My cylinder is large enough to admit a couple of 28 lb. weights. I cover the ingredients with a metal plate, place one weight on the top of it. After a certain time I increase the pressure by putting another weight; and when I find that I can get no more droppings by means of these weights I remove them, and place over the top a thin piece of blotting paper which prevents certainly any immediate mixture of water and spirit; and upon that I pour the water. I have seldom failed, I believe, to get a satisfactory preparation. There is another precaution which I take, when pressure and not displacement finishes the process, and which I mentioned on a former occasion. It was published in the *Pharmaceutical Journal;* but things are forgotton, and, though I am sorry to intrude myself upon you, I find that it is only by doing so again and again that it is remembered that the same thing has been told previously. The other precaution which I take in order to get all I possibly can out of the ingredients, and with as little waste as possible, is this: the Pharmacopœia permits and directs you to add sufficient of the menstruum after pressing to make up the quantity originally ordered. Instead of doing that, after the work is finished I pass the proper quantity through before pressing. I can tell pretty well from notes and experience how much will be lost in preparing one or two gallons, or even a quart. Thus, if there is anything left in the marc I have an extra chance of getting it out if I add at once the supposed loss. I think that is a little improvement. There are several tinctures in the Pharmacopœia which require particular manipulation. I am not going into all the particulars to-day. I may mention tincture of senna, for instance, with raisins in it: and compound tincture of cardamoms. Tincture of orange-peel also. This requires a little management to get not only a satisfactory preparation, but one which is not wasteful; because in the ordinary way the orange-peel absorbs a great quantity of the menstruum, and there is a difficulty in getting it out. However, I have a paper in hand upon tincture of orange-peel, and embracing the question whether it is prepared better from fresh peel or dried.

Mr. Savage: The percolator mentioned by Mr. Haselden has its objections. It is a metal percolator, and metal has an effect upon the tinctures, sometimes turning them much darker. I suggested sometime ago a percolator whereby you might attain all the objects that you desired, and most effectually in any small quantity. It was one of Loysell's percolators by which ordinary coffee is made. It is a decided improvement compared with anything we have. A tube runs down the centre, and about two inches from the bottom is a double diaphragm. Betwixt the diaphragms you put your ingredients. A funnel is screwed on the top. The menstruum passes through the ingredients, and then repasses again, so that the substance is always surrounded with the menstruum. Thus you get a

capital result with very little trouble. With respect to the observations of Mr. Stoddart, there is one thing which cannot be too strongly impressed on my brother pharmacists; that is, with reference to the measures. You will find that in dispensing and ordinary selling in small quantities, by having the two dram measures cylindrical, you will save a great deal in the course of the year.

Mr. Giles: Mr. Stoddart has referred to the preparation of the tincture of ginger. I have been troubled with the puffing which takes place in the marc when you place on the water. I have always been obliged to put on a certain amount of water which displaces the spirit, and then it forms a muck, and this I have to take off with a spoon, then putting on more spirit.

Professor Markoe: The remarks made by the last speaker express the American idea. That is the practice we have been following a long time. Percolation alone is practised in the United States. We consider that maceration is a thing of the past, and that percolation is the process for every drug. Of course with tincture of tolu and resin guaicum, and so forth, maceration is used, but for everything else percolation. We insist in every case on having a perfectly uniform powder, be it coarse or fine. We take the position that the mixture of a fine powder with ligneous particles is entirely wrong. We consider that to turn back a portion of the tincture into the percolator is exceedingly bad practice, and we make it a practice that the first drops shall be as clear as the last. We always carry the percolation to exhaustion. We employ fine powders sifted through a sieve of twenty meshes to the inch, and never use the English method of saturating the drug with the menstruum. Suppose we are working with a pound of the drug, we moisten that in the hand with about one-fourth of the menstruum. This will give a damp powder that will slightly cohere, but will never become pasty. A pasty mass will never properly pack; cylindrical percolators we think the best, but there are many cases in which the conical percolation is used because of certain advantages. For instance, in making fluid extract of gentian which is liable to swell, it would be totally impossible to percolate through a cylinder. If we use a conical percolator, as the substance swells, the slanting sides of the funnel allow it to relieve itself, and it is not a difficult matter to percolate gentian with a powder as fine as 50 or 60 meshes to the inch. Percolation has been carried in the United States to a degree of refinement that is scarcely known in Great Britain, for the reason that the most popular class of preparations are those known as the fluid extracts; these liquids being made of such a strength that each minim shall represent the soluble active principles of one grain of the drug, and one wine ounce shall represent one troy ounce of the drug. As many drugs are injured by heat, our aim is to avoid subsequent evaporation. We consider it poor work on the part of a pharmacist if, taking 16 ounces, we are

not able to practically exhaust it by the time we have got three wine pints of the menstruum. We use the finest powders we can get. The tendency has been to use a menstruum as strongly alcoholic as possible, and to push through whatever remains of the drug. Merely to make up the measure with water, displacing all the contained menstruum is very easily done. When the percolation is done, you just scrape off the pulpy mass. The moment the water is added, it swells up into a mucilaginous mass, and after a little time the percolation stops. It is the practice of several large manufacturers who work on a large scale to go on percolating and exhausting with alcohol, trusting to the use of pressing to press out as much of the menstruum as possible, and keeping it to be used next time the preparation is made. Then, in order to recover what alcohol remains after pressure, the mass is thrown into a large steam-still, mixed with plenty of water, and the alcohol recovered that way.

Professor Wayne: I have very large percolations to make, and it is very necessary to obtain all the alcohol that has been used in percolation. By the use of water you obtain very readily a mucilaginous mass which it is very difficult to percolate, and which gives you an immense amount of trouble. My method is to use an alcoholic menstruum until my substance is completely exhausted. I afterwards distil the magma, using the alcohol in the next percolation of the same substance. I find by that means great economy of time. It requires a very long time if water is used; and long before the point has arrived the root becomes mucilaginous, and water will no longer pass through it; or in warm weather fermentation will set up and acetic acid be formed.

Mr. Umney: Mr. Stoddard remarked in his paper that the contact of the water when put upon the marc to displace the alcohol was merely skin deep. This is contrary to my experience. Let it be required for instance to recover alcohol of 56 over proof (·838) from a marc by displacement with water. It will be found upon examamining the products after rectification that the strength will range from 56 to 40 or 20 over proof, to considerably under proof (·920), therefore, I imagine, to say that the mixing is *only skin deep* is incorrect.

Mr. Stoddart: In replying to what has been said, I can only say that facts are stubborn things, and the tinctures have been made twice over this way, therefore it can be done. With regard to Mr. Haselden's tincture of senna, tincture of cardamoms, and tincture of orangepeel, they are all three substances which do not easily powder. The raisins were, of course, the difficulty, but they were smashed up in a mortar; and you will find there is sufficient of the dry ingredients to suck up the menstruum, and you can actually sift them through a coarse sieve about twenty meshes to the inch. If you repeat these experiments, do not use any diphragm whatever.

I would wish that if anybody in the kingdom intends to repeat my experiments he should use nothing but a tube, and tie over a bit of muslin at the bottom. As to what Mr. Giles has said about the ginger, all I can say is that I get the ginger into a measure put on the spirit, and stir it up with a spatula, and then put it on the muslin and wait till the ginger has settled. I then have a clear liquid.

Mr. Giles: Don't you find that water put on the powder forms a mucilaginous mgma?

Mr. Stoddart: I am coming to that. You first of all stir up the ginger with the spatula and then pour it into the percolator. Let the spirit run through, and leave the top dry. Then you put on exactly the quantity of water that is deficient, and leave it and go to sleep if you like. It does not disturb the top at all; but there will be a dark brown ring, which is the skin-deep mixture which I mentioned. Tincture of myrrh is one of the 26, which are simple solutions. We made it by percolation. As to Professor Markoe, he must forgive me if I disagree with him altogether. He says, first of all moisten the powder, and if there is a swelling of the magma, use a conical percolator. Now, if you let it loose into a conical percolator, you undo my experiment. It has been said that it is impossible to make tincture of gentian in the way I have described. Well, I have done it. I will give you a very easy experiment which any one may try. Get some ground coffee and stir it up with water till it comes into a "muck," as Mr. Giles calls it. It must be just so liquid that the muck, when put down into the percolator, will run of its own accord. Then if you put a pint of water you will have your extract of coffee in magnificent style, and if you are economical, put another pint of water on the top, and you will get a liquid of about a third of the strength of the first.

ON THE ADULTERATION OF ESSENTIAL OILS WITH ALCOHOL, CHLOROFORM AND THE CHEAP OILS OF PINES.*

BY DR. HAGER.

The adulterations of essential oil with alcohol are not unfrequent, and especially is it practised with the most costly oils. The best method to detect these adulterations is the following:—Five to ten drops of the oil are put in a test tube together with a piece of tannic acid of the size of a pea, and moistened on all sides by gently

*Translated in the Chemist and Druggist.

shaking the tube. Usually tannic acid is insoluble in essential oils and floats, if they are unadulterated, for whole days at the surface without being changed in the least degree. If the oil contains alcohol, then the tannic acid attracts the latter, according to the quantity, within three to forty-eight hours, and forms a more or less pellucid, sticky, tough or soft mass, which sinks to the bottom and sticks firmly to the sides of the tube, so that it is not moved when the latter is agitated. The consistence may be examined by means of a knitting-pin. If the oil contains traces of moisture this does impair the value of the test, only a few oils (*e.g.* ol. sinapsis) show then a different behaviour. The tannic acid settles in this case in the form of a hyaline mass, but when examined with the knitting-pin it proves not tough or soft, but hard, and it can even be divided in small pieces. With ol. amygd., ol. cassiæ. and some sorts of ol. caryoph. the tannin test is not admissable, for in their pure state they dissolve tannic acid; and if adulterated with alcohol, even in considerable quantities. Still the test can be applied to these oils, when they are mixed with twice their volume of rectified oil of turpentine; but it this case they must stand for about two days. If the essential oils contain large quantities of alcohol, the tannic acid becomes entirely dissolved. A second method is the sodium test, founded on the fact that those oils which are hydro-carburets, present no changes or reactions on the addition of sodium; and those containing oxygen besides carburetted hydrogen, give with sodium a very moderate evolution of hydrogen gas, and show in the first five or ten minutes of the reaction little change, while those adulterated with alcohol show a violent and rapid evolution of hydrogen, and very soon become brown or dark brown, semi-fluid or solid. Ten drops of oil and a small piece of metallic sodium are placed in a test tube for the experiment. This method is less effective than the tannin test; an adulteration of 3 to 5 per cent. cannot be proved by it with certainty. A reaction of sodium does not take place or is very little perceptible with the following pure oils:—Balsami copaibæ, bergamot, ceræ, citri, lavender, menth. crisp., menth. pip., muc. mosch., petit-grain, piperis, rosemary, sativæ, succini, terebinth. To these oils the sodium test is undoubtedly applicable.

Adulteration with Chloroform.—The latter is not always recognizable by taste or smell, especially when present to a small amount only; in all cases it will considerably increase the specific gravity of the oil. The best way to detect it is the following:—

Fifteen drops of the oil, 45 to 90 of rectified spirit, 30 to 40 drops diluted sulphuric acid, are placed in a test tube together, with two or three scraps of zinc, heated till a rapid evolution of hydrogen takes place. After shaking it well, put aside and heat again, when the evolution of hydrogen begins to lessen. This heating and gently shaking of the liquid is repeated several times. After the

lapse of twenty or twenty-five minutes an equal volume of cold distilled water is added, the liquid well shaken, and then filtered through filtering paper, previously moistened. The filtered liquor is made strongly acid by the addition of nitric acid, and then tested with solution of nitrate of silver. If chloroform was present a turbidity or precipitate of chloride of silver appears. When ol. amygd. amar. is the subject of the examination, the precipitate is to be tested for cyanide of silver. This is effected by pouring on 25 drops of distilled water, and 40 drops of pure, concentrated sulphuric acid. When gently boiled, cyanide of silver becomes dissolved, but not chloride of silver.

Adulteration with the Essential Oils of Pines or other cheap Essential Oils.—If the nose fails to detect these adulterations, the following tests have to be applied.

1. Solubility in rectified spirit at middle temperature (15 to 20° C.) Five drops of the oil are placed in a test tube, and added to the same, double, or larger quantity of rectified spirit; and after gently shaking clear solution should result.

One volume of essential oil requires for solution rectified spirit—

	Vol.		Vol.
Oleum Absinthii	1	Oleum Juniperi	10
" Amygd. am	1	" Lavandulæ	1
" Animale æth	1	" Macis	5
" Anisi	3 to 5	" Majoranæ	1
" *Aurantii dulc	7	" Menth. crisp	1
" *Bals. Copaiba	50	" " pip	1
" Bergamot	½	" Petit-grain	1
" Cajeputi	1	" Petroselini	3 to 5
" Calami	1	" *Pini sylvestris	9
" Carui	1	" Rosmarina	2
" Caryophyll	1	" Rutæ	1
" Chamomill	7	" Sabinæ	2
" Cinnamomi Cassiæ	1	" Sativæ	1
" *Cort. aurant	15	" Sinapis	⅔
" *Cort citri	7	" *Succini rectific	15
" *Cubebæ	25	" Tanaceti	1
" Flor. aurantii	1 to 2	" Terebinth	9
" Fœniculi	1 to 2	" Thymi	1
" *Hyssopi	3	" Valerianæ	1

Those marked * dissolve, but not always perfectly clear.

The results obtained by this method cannot be regarded as conclusive for the presence or absence of pine oils. The less soluble oil becomes more soluble in alcohol, when mixed with an oil that is easily dissolved by rectified spirit; on the other hand an adulteration cannot be regarded as proved, when one or the other oil gives a

turbid mixture. The oil makes itself only suspicious by that, and is to be subjected to a further examination.

2. *Examination with Iodine* is founded on the fact that some oils, mainly those of the pines, detonate briskly with Iodine, others develop heat and vapors, and some remain indifferent. In a watch-glass are placed 1 to 2 grains of dry iodine and 4 to 6 drops of the oil. A lively reaction (detonation) accompanied with considerable rise of temperature and evolution of vapours take place with the following oils:—

a. Absinthii, cort. aurant, flor. aurantii, bergamot, citri, lavandulæ, macis, origani, pini, sabinæ, spicæ, terebinthinæ.

b. None of these reactions are observed with Amygd. am., animale Dippelii, asphalti, balsami copaibæ, cajeputi, calami, caryophylli, cascarillæ, cinæ, cinnam, mellissæ indic, menth. pip, petræ, petroselini, rosarum, rutæ, sinapis, succini rectif, tanaceti, valerianæ.

c. Insignificant rise of temperature and little development of vapors are exhibited by *Oleum*—Anethi, anisi, anisi stellati, arnicæ, cardamomi, chamomillæ, cubebarum, fœniculi, hyssopi, majoranæ, melissæ, menth. crisp., rosmarini, sativæ, sassafras, serpylli, thymi.

When an oil of the second series becomes heated with iodine, it may be adulterated with a cheap oil of the first series. The same is the case when an oil of the third series shows a strong reaction, and expels vapors with considerable heat.

EUCALYPTUS GLOBULUS.*

We glean the following facts regarding this new anti-malarial remedy from an abstract of the memoir of Prof. Gubler in the *Journal de Pharmacie et de Chimie.*

This botanical family belongs to the same species which furnishes cloves, allspice, and the oil of cajuput. It is indigenous to Australia and Van Dieman's Land. It is a tree, which often attains a gigantic height; all parts of it are impregnated with an aromatic substance, most abundant in the young branches, flowers and leaves. The febrifuge properties of the eucalyptus have been established by numerous observations. Under the name of "fever tree," it constitutes in Australia and the neighboring countries, the popular remedy against the prevailing fevers. The observations of a number of European physicians agree in placing its febrifuge powers in the most favorable light. Success in its use seems to be the rule, almost without exception, and it is in cases most rebellious to quinine and the other febrifuges that the leaves of the eucalyptus are reported to have produced the most remarkable results.

*PHARMACIST.

It would seem that these trees exert a marked hygienic influence wherever they are found. It is cited as a notorious fact that intermittent fevers are entirely unknown in regions favored by their growth, whereas, in localities similar in respect to climate, soil, etc., but destitute of eucalyptus, the population is decimated by paludal fevers. It is generally supposed that the marsh miasms are neutralized by the aromatic emanation from the trees, but Prof. Gubler regards it as probable that the sanative results are to be in part attributed to the purifying effects of the offal of the foliage and the continually desquamating bark upon the stagnant waters. Of such waters travelers drink with impunity, whereas it is imprudent to drink from similar marshes not bordered by these trees.

Eucalyptus is employed as a stimulant and disinfectant dressing to wounds, and as an astringent and hæmostatic. It is useful in leucorrhœa; its success in this condition is attributed by Prof. Gubler to its toxic effect upon the several infusoria which exist in the vaginal secretion.

The power of the active principle of the eucalyptus in preventing the development of cryptogams is remarkable. Solutions of the salts of morphia, strychnia, atropia, aconita and eserina, for hypodermic injection, prepared with water distilled from eucalyptus leaves, retained their limpidity for several weeks, while other solutions prepared with pure water became turbid with confervoid flocculi in a few days.

M. Cloez has discovered in the leaves of eucalyptus a volatile oil which he has designated *eucalyptol*, the formula of which is $C^{24}H^{20}O^2$ boiling between 170°and 175°C, and more or less soluble in alcohol, ether, and the fixed and volatile oils.

Eucalyptol possesses a peculiar, fragrant, aromatic odor. Its taste is aromatic, pungent, bitter, and slightly acrid. In moderate doses it is well tolerated. Large doses produce a slight sensation of burning in the mouth, extending to the throat and gullet, and exciting the secretions of the mucous membrane of the mouth and salivary glands. They cause a sense of weight in the stomach and interfere with the digestive process. In some cases, when largely given, headache, general excitation, great restlessness and fever are produced. These symptoms are of short duration, rarely continuing beyond a few hours. Such effects are never witnessed in the anæmic; with these, eucalyptol produces sleep. When breathed in too great quantity in a confined space, the vapors of eucalyptol produce symptoms of intoxication, sometimes accompanied with headache. The powdered leaves are prescribed in doses of from one to four drachms. The medium dose of eucalyptol is 15 to 30 grains.

Dr. David Wooster, of California, in the *Pacific Medical and Surgical Journal*, after an extended trial of the fluid extract of Eucalyptus, reports it to be a diuretic of rare virtue; an aromatic tonic with decided restorative powers in typhoid conditions. In.

affections of the mucous membranes, its beneficial action was found to be remarkable. It was curative of vesical catarrh and gonorrhœa. It had no antiperiodic action. As an external application to chronic ulcers it was of great value.

NEW USES OF CELLULOSE.*

Chemists have long known that cellulose resists the action of the most powerful reagents; boiling it with potash, soda, soap chloride of lime, etc., has no effect. Chloride of aluminum attacks it somewhat; the best solvent has recently been discovered by Schweitzer, which consists of an ammoniacal solution of the oxide of copper or cupro-ammonium, which has the property of completely dissolving cellulose without in the least destroying its chemical or physical properties, as it can be precipitated in a perfectly pure state from the solution. It is proposed to make practical use of this important discovery by acting upon woody fibre, vegetable tissue, paper stock, rags and refuse seaweed, in a way to prepare a numerous class of objects from them. The solution of woody fibre is accomplished with more or less rapidity, according to the condition of the material; old linen and cotton rags dissolve immediately. Several applications have already suggested themselves to inventors; for example, to render impermeable. Sheets of paper are immersed for a few moments in the cupro-ammonium solution, then pressed between rollers and dried. Paper thus treated becomes impermeable even to boiling water, and water-tight bags could be constructed of such material. By multiplying the sheets of this prepared paper and rolling them together, a multitude of objects of value in domestic economy and the arts could be prepared. Another property of the cupro-ammonium solution is to impart greater tenacity to linen and paper. If we plunge a strip of paper, the tenacity of which has been previously tested, into the ammonical solution, and press and dry it between rollers, it will be found to have increased as much in strength as parchment paper prepared by immersion in sulphuric acid. Here, again, by employing a number of strips of paper it is possible to form a band as strong as leather, and it is a question whether numerous subtitutes for leather could not be made in this way. The discovery of Schweitzer has already been applied to the manufacture of roofing, pipes, water conductors, safety fuses, hats, boats, and clothing. We should suppose that the treatment of all kinds of cellulose, wood, grass, linen, cotton, sawdust, etc., as a preliminary step in the preparation of gun-cotton, collodion and dualin, would prove to be of great practical value. Dr. H. Vogel has

*Journal of Applied Chemistry.

already shown that precipitated gun-cotton affords the best film for photographic purposes, and it is possible that by dissolving cellulose in cupro-ammonium, then precipitating it, and subsequently converting it in the usual manner into tri- nitro cellulose, or gun-cotton, a very superior article could be obtained from inferior stock. There are various ways for preparing the cupro-ammonium. One is to dissolve sulphate of copper in caustic ammonia on a large scale. Copper turnings can be digested in caustic ammonia with access of air, until a concentrated solution is obtained. Only a concentrated cupro-ammonium solution attacks the fibre, and when the liquid is diluted the cellulose is at once precipitated. The discovery of Schweitzer opens up an important era in chemical manufacture, and will lead to many valuable applications.

TINCTURE OF CALABAR BEAN.*

BY R. ROTHER.

Eserine, the alkaloid, is the active principle of calabar bean. The leguminous seed contains it closely enveloped within its substance, the bulk of which is starch and legumin or vegetable casein. The alkaloid occurs in nature partially combined as a salt. Alcohol, strong or dilute, extracts the virtue of the bean, but water alone effects this less completely. When treated with strong alcohol the substance must be in a very fine powder, and requires a preliminary digestion with the menstruum before proceeding with the percolation, otherwise the exhaustion will not be perfectly attained. The original solid material is impervious to strong alcohol, and since the solvent effect of this depends upon surface action mainly, hence a coarse powder is wholly inapplicable for the purpose of extraction with this liquid. The pulverization of calabar bean is rather difficult, in a small way, on account of its hardness and peculiar structure, and, moreover, great care must be exercised in the operation to avoid dusting, by reason of the poisonous character of the drug; consequently, a process which admits the application of a coarse powder together with a weaker alcohol would be much more desirable than the method in present use.

The employment of acetic acid as a part of the menstruum, results in the conversion of the alkaloid into soluble acetate; but a weak alcohol directly applied to a coarse powder does not appear to act favorably; the solution legumin and the unchanged starch interfere with the process.

Water swells the material, dissolving the legumin, and if the mixture is allowed to stand in a warm place for a few days it will

*Pharmacist and Chemical Record.

become putrid. If however a small quantity of acetic acid be first added the legumin will not dissolve, but shortly the vinous fermentation will begin, resulting in the copious evolutions of carbonic acid, the disappearance of the starch and total disintegration of the original structure. By this change the alkaloid is exposed and easily and completely extracted by the acetic acid. After a few days, and rather before the end of the vinous fermentation, an equal volume of strong alcohol is added to the mixture and the maceration continued several days. It now becomes necessary to separate the liquid from the insoluble residue and complete the exhaustion. The process is therefore finished by percolation. For this purpose it become necessary, which is indeed a decided advantage in all percolations, to produce a solid substratum of coarse powder. Such is effected in this case by pouring part of the mixture upon a muslin strainer, separating the liquid by pressure and forming a solid layer several inches high in the bottom of the percolator with the residual remnant on the strainer. Upon this foundation the remaining mixture is poured, together with the strained liquid, and then followed by a mixture composed of equal measures of strong alcohol and water until the required volume of percolate has passed. The preparation has a deep amber tint.

The tincture should conform in the proportion of the solid material with most other tinctures and therefore contain 2 troy ounces of the bean to the pint of finished product.

The process is as follows:

Take of Calabar Bean, in No. 50 powder	16 troy ounces.
Acetic Acid	half a fluid ounce.
Strong Alcohol, Water	of each sufficient.

Mix the acid with three pints of water; pour this upon the powder and set the mixture aside for a few days in a warm place. Then add to it three pints of strong alcohol and macerate it a few days longer. After this pour part of the mixture upon a muslin strainer; press the liquid out, and pack the residue of the strainer firmly into a cylindrical glass percolator having a broad base; pour on to this foundation the rest of the mixture together with the strained liquid, and then a mixture of equal parts of strong alcohol and water, until eight pints of percolate has passed.

RESEARCHES UPON THE PROPERTIES OF THE ACTIVE PRINCIPLES OF OPIUM.*

M. Rabuteau read a paper upon the above subject before the French Academy, April 22; an abstract of which is contained in *Revue de Therap. Med.-Chir*,, June 15, 1872. He said that Claude-Bernard had shown by his experiments that the chief active principles of opium acts differently upon animals. Only three of them, narceine, morphine, and codeine are soporific, and that these in large doses are toxic in diverse degree, and that they all induce convulsions except narceine.

My experiments, some one hundred and fifty in number; have been made upon healthy or sick men, dogs, rabbits, and frogs. I have studied not only the six principal alkaloids of opium, but also meconia and meconic acid, and have administered both hypodermically and by the stomach.

Thebaine.—According to Claude-Bernard this is the most poisonous to animals of all these alkaloids. This is true, but does not apply to man, who can take without danger ten to fifteen centigrammes of muriate of thebaine. I have found that this substance, injected subcutaneously in neuralgia, acted as an anæsthetic like morphia. I have also found that it is wanting in the power of checking intestinal secretion, and that it is not soporific in man.

Papaverin.—This substance is much less active than thebaine; no symptoms are induced by fifteen centigrammes of its muriate administered hypodermically to the rabbit, twenty-five to a dog. On man it is equally inert, and does not act upon the intestinal secretions, but is slightly anæsthetic.

Narcotina.—Following Bernard, narcotina is the least poisonous of the bases in its action on dogs. It is the same in man, as I have taken at a dose forty-three centigrammes of its muriate without effect. It does not check intestinal secretion, nor is it soporific, either in man or animals. It is not, however, absolutely inert, for it causes in very large doses (three centigrammes) slight convulsions in the frog.

Codeine.—This drug is more dangerous than morphia, and less so than thebaine to the animal. It is otherwise in man. In doses of five to ten centigrammes it produces heaviness in the head and weakness of the limbs. It does not arrest intestinal secretion, and is very slightly analgesic or soporific in man.

Narceine.—This is the most soporific of the opium alkaloids to the animal. It is necessary, however, to inject under the skin of a moderate-sized dog five centigrammes to cause deep sleep. It is much less soporific than morphia in man. But in ten to twenty centigramme doses it causes a calm sleep, not so profound and more

*New Remedies.

natural than that of morphia. Lastly, this precious substance is largely anæsthetic. It diminishes the flow of urine, has much less action on the intestinal secretion than morphia, but as it does not disturb digestion, is useful in the diarrhœa of phthisis.

Morphine.—This is the most active of the alkaloids as regards man, but, according to Cl.-Bernard, the fourth in rank as regards animals.

Meconine and Meconic Acid.—I have shown that meconic acid is inert even in large doses. I have injected fifty centigrammes into the blood of a dog, and have taken one to three grammes of the bimeconates of soda and potash without producing any symptoms. The reaction of the perchloride of iron and meconic acid could always be developed in the urine, which was neutral. Meconine is equally inactive.

The alkaloids of opium might be classed as follows, in order, according to their effects on man:—

Soporifics.—Morphine, narceine, codeine.

Toxics.—Morphine, codeine, thebaine, papaverine, narceine, narcotine.

Analgesics.—Narceine, morphine, thebaine, papaverine, codeine.

Anexosmotics.—Morphine, narceine.

Combined Action of Alkaloids of Opium and Chloroform or Bromoform.—It is known that the combined action of morphine and chloroform is analgesic without of necessity sleep being induced.

A dog which had received, under the skin, five centigrammes of muriate of narceine, and then been put to sleep with chloroform, felt nothing after he awoke. Pinching, sticking, or even treading on his feet caused no indications of pain, and yet he ran about the laboratory. This curious condition lasted for many hours, during which the sensitive nervous system was, as it were, abolished. I have seen the same results in using bromoform or chloral in the same way, and the other alkaloids of opium, except narcotina, in diverse degree.

At the seance of the French Academy, May 13, M. Bouchert read a paper "On the opium alkaloids in regard to their action on children and adults." His conclusions were:—

First—That the alkaloids of opium may be divided in two groups, those which are soporific, and those which are inert.

Second—The alkaloids of the first class differ in activity, and in as large a dose as can be safely administered have no convulsant action, but are toxic when taken in sufficient quantity.

Third—Morphia, with its salts, is the most active of all the opium alkaloids.

Fourth—Codeia comes next to morphia as a soporific and anæsthetic, but it only is one-third as strong as the last alkaloid.

Fifth—Narceine comes next to codeia, but may be taken in large doses without much effect.

Sixth—Papaverine has no effect in doses of one gramme by the stomach, or ten centigrammes hypodermically.

Seventh—Neither narcotine, nor thebaine produces any symptoms in does of fifty centigrammes.

Eighth—Meconine causes no appreciable effect in does of thirty to fifty centigrammes.

Ninth—Opianic acid is inert.

Tenth—Morphia and codeia are the only opium alkaloids of therapeutic value.

PHARMACEUTICAL AND MEDICINAL USES OF GLYCERIN.

In the *Journal of Applied Chemistry* Prof. Joy gives the following summary of the uses to which glycerin may be applied :—

The following recipe is for the preparation of glycerine lotion : Glycerin, 3 fluid ounces; mucilage quince seeds, U. S. D., 10 fluid drachms; pulverized cochineal, 5 grains; hot water, 1½ fluid ounces, deodorized alcohol, 2½ fluid ounces; oil rose, 8 drops; pulverized gum arabic, ½ drachm; water, 8 fluid ounces. Rub the powdered cochineal first, with the hot water gradually added, and then add the alcohol. Triturate the oil of rose with the powdered gum arabic, and gradually add the water, as in making an emulsion. With this mix well the solution first formed, and filter, and to the filtered liquid add the glycerin and mucilage of quince seeds, and shake well. The mucilage of quince seeds should always be freshly made.

A good ointment is made by boiling 80 grains of starch in one fluid ounce of glycerin. The ointment never becomes rancid; it is inodorous and does not change. Corn starch has been found best suited for the purpose. A stiff plaster can also be made with 150 grains of starch boiled in one ounce of glycerin. A sedative plaster is made with sulphate of atropia, 3 grains; veratria, 3 grains; sulphate morphia, 8 grains; otto of roses, 1 drop; hard glycerine ointment, 1 ounce.

Four parts by weight of yolk of egg rubbed in a mortar with five parts of glycerine, give you a preparation of great value as an unguent for application to broken surfaces of the skin. It has a honey-like consistency, is unctuous, like fatty substances, but has the advantage over them of being easily removed by water. It is also unalterable. Applied to the skin it forms a varnish, which effectually excludes the air and prevents its irritating effects. These properties render it serviceable for erysipelas and cutaneous diseases, of which it allays the action.

Glycerin vaccine lymph is highly prized on account of its stable

character. For its preparation, the pustules of a healthy vaccinated person are opened with a needle and the effluent carefully removed by means of a lancet. It is put into a suitable vessel and mixed with twice its quantity of chemically prepared glycerin and as much distilled water. The liquids must be thoroughly incorporated by means of a paint brush, and for preparation can be put into capillary tubes.

A glycerin ointment of much repute for chapped hands and excoriations is made as follows: One half ounce of spermaceti is melted together with a drachm of white wax and two fluid ounces of oil of almonds, by a moderate heat; the mixture is poured into a Wedgewood mortar, when a fluid ounce of glycerin is added to it and rubbed until the ingredients are thoroughly mixed and cold.

The introduction of glycerin in small quantity into pills prevents induration and decomposition. Where resin is present it is well to add a small quantity of alcohol. In general the substitution of glycerin for syrups in prescribing medicine in liquid form is highly recommended by physicians; the reasons for this recommendation may be stated as follows: It possesses greater solvent power, and mixes well with most substances; it acts as a preservative to the medicine by preventing fermentation and decomposition; in the practice of children it counteracts fermentation in the stomach, acts as a nutritive, and diminishes irritation in the alimentary canal; it has no superior for giving acrid substances, such as tincture of guaiac, turpentine, ammonia, chloroform, acids, etc.

Sesquichloride of iron and glycerin have been prescribed in cases of diptheria. The mixture consists of two ounces of pure glycerin and 20 drops of the liquor ferri sesquichloride. Half a teaspoonful is given every hour throughout the day and night until the symptoms appear to be mitigated. With the object of dissolving the exudate, a mixture of 2 ounces of glycerine and 20 grains of borax is similarly given in doses of a teaspoonful at a time. The good effects in cases of hoarseness and loss of voice led to the application of glycerin to the treatment of croup. The application is made by inhalation through some form of atomizing apparatus.

Dr. Fanto (*Wiener Medicinische Zeitung*) remarks that leading dermatologists are coming to use glycerin, locally applied, as a substitute for many internal remedies that have been extensively employed in cutaneous affections. Glycerin has proved especially valuable in cases of abnormal secretion of sebaceous substances. This is caused by disease of the sebaceous glands, and has its seat, not, as was formerly supposed in the subcutaneous connective tissue, but in the corium itself. Sometimes the complaint takes the form of hypersecretion from these glands. This occurs for the most part in infancy, and is known as *seborrhœa*. It is most commonly seen on the scalp, on the face near the ear muscles, and, more rarely on the extremeties. In such cases glycerin acts excellently

in softening the hardened masses of sebum on the surface of the skin, and in diminishing the irritation of the organs affected. In conjunction with borax, zinc and acetate of lead, it also diminishes the amount of secretion. In many instances the treatment must be continued for a considerable time, in order to effect a cure.

Glycerin is equally useful in cases where there is a diminution of the sebaceous secretion, which may lead to pityriasis. In this harsh state of the skin, the softness and natural elasticity may be restored by rubbing glycerin into it. None but a perfectly pure article should be used.

ON THE SOLUBILITY OF SOME SALTS OF QUININE.*

In *L'Union Pharmaceutique* (April and May), M. Schlagdenhauffen has an elaborate paper with the above caption, from which we abstract the following table:—

Quantity dissolved in one cubic centimetre.

Name of Salt.	Temperature (C.).		
	30°.	20°.	10°.
Acetate	0.091	0.037	0.027
Chlorohydrate	0.092	0.049	0.031
Hypophosphite	0.12	0.097	0.065
Formiate	0.33	0.296	0.272
Lactate	0.35	0.31	0.29
Sulphomethylate	0.80	0.71	0.60
Sulphovinate	0.80	0.72	0.60

*New Remedies.

Editorial.

ELEGANT PHARMACY.

Whether the term "elegant" is of so wide a range of adaptability as to be applied, with propriety, to pharmaceutical preparations, is a matter which admits of some little doubt. Although making slight pretensions to an acute perception of the appropriate use of words, it seems difficult to harmonize pre-conceived ideas of elegance with the sense in which the word is now, so generally, and so frequently, employed. A pharmaceutical combination more perfect than ordinary—a nice adaptation to the intended purpose—the presence of a certain consistency, color, form, flavor, or odor, are each held sufficient to confer elegance. Thus, when to a vile dose of castor oil some addition is made which renders it a trifle less calculated to excite disgust, the preparation is said to be an elegant one—it is certainly not devoid of taste, and on this ground may found some claim to a more pretentious designation, but we hardly think that elegant should be the word. Appealing to Webster we find the synonyma "beautiful, polished, graceful, refined, handsome." We fear that none of these could be applied to our castor oil compound. But we are getting off pharmaceutical ground, and must leave this discussion to those more learned in philological distinctions, and endowed with a greater amount of synonymous discrimination.

The wares of the apothecary and those of the confectioner have always been held as directly antipodal. Physic has never been considered very toothsome; nor have drugs been a generally marketable commodity. A drug on the market is that which nobody wants: something possessing a minimum of attractions—or, at least, attractions of such a kind as to be unappreciated by a gastronomical public. Truly, medicine is seldom palatable, generally, quite the reverse. It may be that this is one of the conditions of the heritage entailed upon us by the frugiverous propensities of our common ancestor—a thorn on the rose; a sting for the honey—in any case, it is an undeniable fact that the great majority of substances possessed of medicinal activity have an undeniably disagreeable taste.

To reverse this unfortunate arrangement is the aim of elegant pharmacy, and not until the pharmacist can attain to the enviable position occupied by the maker of bon bons, or the compounder of cocktails and juleps, will this grand object be accomplished.

We do not wish to be understood as depreciating the efforts made to improve the ancient and unscientific formulæ by which medicines have been compounded; or the substitution of nauseous compounds by those more agreeable; or the separation of worthless or inert materials from those of greater activity. These are legitimate fields of labor: provided always that the therapeutical value of the medicines operated upon is in no wise impaired; and that the presentation of the remedy in all its activity is the prime object in view. These conditions form the line of demarkation between pharmacy proper and that debased counterfeit against which this article is directed, and these will form a standard to which all so-called improvements may be referred.

Of how many of the elegant preparations with which our market is flooded can it be said that these conditions have been regarded or fulfilled? It will, almost invariably, be found that medicinal effect, if not altogether lost sight of, is made entirely subservient to some other object. Your elegant pharmacist, slack, perhaps, in work, but of great greed, and fruitful in expedients, determines to extend his business in the preparation line. This may be accomplished in two particular directions, each based on separate considerations having their origin in certain weaknesses or contrarities of mankind. —The fondness of the public for doctoring themselves: or being doctored, and their aversion to taking disagreeable medicine, or their love of alcoholic stimulants, and their dislike of recognizing themselves, or being recognized, as the subject of that love. To the unscrupulous man a clear course is open. The dyspeptic shall think he is taking his pepsine, his iron or bismuth, and he shall only take sugar and water. The tee-totaller shall have his dram and his sarsaparilla at one and the same dose. Ten to one your pharmacist will make him an elixir. He gathers him together the grand ingredients :—water, sugar, alcohol, a little flavoring, with, perhaps, a dash of wine, and lo! the elixir is complete. And now the name: what shall it be, or rather, what shall it not be? for there is a very wide range. Shall it be a simple elixir of beef, or a potent preparation of strychnine; or happier thought, a combination of both. The

question is settled, and by a nicely worded circular setting forth the peculiar tonic and appetizing properties of the strychnia and the satisfying and strengthening effects of the beef—the nostrum is introduced into the market. To ensure success nothing now is wanted but medical patronage. This can be surely obtained from the dealer in percentages, if all the avenues of gratitude in the heart of that usurious professional are not already closed up. An offer of thirty-three per cent. closes the business, and the success of our elixir is complete.

We are convinced that the greater number of these elixirs, and other impostures of a kindred nature, originate in the manner we have described. In the United States, the evil is said to have assumed gigantic proportions, and this country is fast following in the wake. It is high time for us to enter a protest against these practices, and all respectable pharmacists should lend their influence to stem the tide. We are pleased to learn from the proceedings of the American Pharmaceutical Association, reported by our correspondent, in the October number of the Journal, that a paper, on this subject, was read by Mr. Eberbach, a prominent member of the Association, which elicited the universal approval of the members present. We are told that the preparations alluded to in the paper were generally found to be as worthless as we have represented them, and these conclusions were verified by actual experiments made upon a great portion of those in the market. As soon as we are able to procure this paper we shall have great pleasure in presenting it to our readers.

There is another department of elegant pharmacy to which we might allude, but we know that it is too well established by custom and convenience for any effort against it to be effective. We refer to the substitution of active principles for the crude drug, or some preparation of the crude drug. The isolation of alkaloids is of this order, but although we know that morphia does not represent all the virtues of opium, or quinine those of cinchona, it is vastly more convenient to use the less bulky alkaloids. This subject has been taken up by many writers, and it has been amply demonstrated, that, on therapeutic grounds, the substitution is unjustifiable. Referring to this the authors of United States Dispensatory say, "We are not absolutely certain that the alkaloids are the only active ingredients, and even supposing them to be so, we are equally uncer-

tain whether they may not be somewhat modified in their properties, even by the therapeutically inert principles with which they are associated." As an example of this, jalapin may be instanced: The dose of jalap root is from ten to fifteen grains, which at most would not contain more than three grains of resin, yet in order to obtain a corresponding purgative effect, eight grains of the resin must be employed. Again, as pointed out by many observers, "the effects of jalap resin are so violent and uncontrollable that it is, at present, little used in general practice, while the root in substance still holds an important place in our Pharmacopœias." The same may be said of emetia and ipecac, and many other vegetable principles. It is useless to multiply instances as the greater convenience in administration will probably always outweigh therapeutical considerations. We should, however, be influenced by these facts, and always favor those preparations which retain the active ingredient in its natural state of combination. Tinctures and fluid extracts are not open to an objection of this kind, and we are glad to see that medical practitioners are beginning to recognize the advantages pertaining to the latter class. The dose of a fluid-extract is, usually, so small that it offers no barrier to convenience in administration.

THE TINCTURES AND WINES OF THE BRITISH PHARMACOPŒIA.

We have devoted a considerable amount of space in the present number to a paper bearing the above title, which was presented by Messrs. W. W. Stoddart and R. L. Tucker, at the recent meeting of the British Pharmaceutical Conference, at Brighton. The subject is one of importance to pharmacists, as it relates to a series of preparations which are, commonly, prepared in the shop, and we think that the paper, together with the discussion to which it gave rise, will prove both interesting and instructive to our readers. Its chief point of value is the comprehensive and carefully compiled tables given of the specific gravity, solid contents, &c., of the tinctures experimented upon.

Of all the preparations of the Pharmacopœia, these are, perhaps, the most variable and unreliable in character. This is owing to want of skill on the part of those to whom their manufacture is entrusted; to the indefinite nature of the ingredients operated upon, and to the difficulty of estimating the character of the product. In regard to the last particular, the tables in question may prove of material value, as supplying a standard to which the specific gravity may be referred.

We do not wish to be understood to say that the quality of a tincture may be ascertained by taking its density. This method would, of course, afford no criterion of the quality of the ingredients, or their medicinal activity; but it would, certainly, give a tolerably correct idea of the care with which the exhaustion of the materials was conducted; and, supposing the ingredients to be reliable, would consequently represent the comparative value of the product.

The views as to the manner of conducting the process of percolation, which are advanced by the authors of the paper, do not agree with those which we have found to be experimentally correct, but in an article like the present it might not, perhaps, be in good taste to particularize. It may, however, be said, that amongst the great body of American pharmacists who have experimented and written upon the subject, we cannot recall one who came to the same conclusions as those referred to. In the preparation of most of the tinctures of the *British Pharmacopœia*, the method proposed might answer well enough, as those preparations contain a large amount of menstruum to the solid ingredients. It is when we have to exhaust materials with two or three times their weight of liquid that the efficiency of the various methods is demonstrated. We think that in such cases it will be generally admitted that the quantity of liquid used to moisten the powder should never be more than is necessary to enable the operation of packing to be properly performed.

In regard to the fineness of the powder we do not think that any standard, which is applicable to all substances, can be definitely fixed. It certainly seems reasonable that materials of a hard and compact structure should be in a more minute state of comminution than those which are soft and porous. Take, for instance, the instances of gentian and nux vomica. It might be perfectly easy to percolate the former of these, if it had previously

passed through a sieve of twenty meshes to the inch, but a preparation—even the B. P. tincture—made with nux vomica of that degree of fineness would not, we think, be very reliable. Again, the fineness should depend on the nature of the menstruum—aqueous or spirituous—and further, we think the quantity of solid ingredients should also influence this consideration. A percolator charged with two or three hundred pounds requires a coarser powder than if only as many ounces are operated upon.

In regard to the addition of water for the purpose of displacing the spirit remaining in the exhausted materials, we must confess that, either from want of skill or some other reason, we have never been able to realize very satisfactory results. Even when every precaution is taken, and the disappearance of the last portion of spirit carefully noted before the addition of the water, there is always a considerable deficiency in the measure of the undiluted percolate; although the amount of *clear* tincture recovered may equal that of the menstruum used. The brightness of this last product is not a proof that it is unmixed with water, but simply that precipitation has not taken place.

We have already trespassed beyond the legitimate bounds of an editorial, and shall defer any further remarks until a more fitting opportunity.

PHARMACEUTICAL DEGREES.

A meeting of the convention of teaching colleges of pharmacy of the United States was held at Cleveland during last month. There was a full attendance, nine colleges being represented. The principal business of the meeting was the discussion of three questions which had been propounded at the previous annual meeting. The first of these related to analytical chemistry; whether a knowledge of such is essential to a thorough pharmaceutical education. The necessity of instruction in this branch was apparent, and it was urged that facilities should be provided by the various colleges; but at this time it was not deemed advisable to consider a familiarity with analytical chemistry an obligatory qualification for graduation.

The second question was as to whether the questions given at the various pharmaceutical examinations should not be annually

reported, and, if deemed necessary, discussed, for the purpose of establishing, as nearly as possible, a uniform standard. This was unanimously decided in the affirmative.

The subject of pharmaceutical degrees was next taken up, and it was agreed that the title of *Master in Pharmacy* should be conferred upon graduates who, having passed three years in gaining a practical knowledge of the business, may succeed in passing a satisfactory examination in the higher branches of professional study.

Upon such persons as may have specially distinguished themselves in the advancement of science—and, we presume, more particularly those who have devoted their attention to the special branches relating to pharmaceutical studies—the title of *Doctor of Pharmacy* may be conferred as an honorary distinction.

Presence of Water in Commercial Iodine.—Iodine, which has not been resublimed, is seldom effective in combining in atomic proportion with those substances to which it may be presented. This is less noticeable than it might be, from the fact that, in most of our officinal preparations, the combining substance is usually in excess of the iodine—as in the case of the iron in the preparation of *syrupus ferri iodidi*. These compounds are frequently weaker than they should be. This fact is to be accounted for by the presence of water in the iodine. Recent analyses of commercial iodine by Professor Wanklyn, give an average of ten per cent. of water; while inferior specimens will sometimes contain over 20 per cent. Any one who has prepared iodide of sulphur from ordinary iodine, will have noticed the interstitial water it contains. If the product be poured out in a fused condition, this water separates in considerable quantity. This fact should always be borne in mind in making these preparations, and the amount of moisture estimated and allowed for; or better, the resublimed article be employed.

College of Technology.—We understand that, so far, only one student has taken advantage of the provisions of the Council for those from the country who desire to avail themselves of the educational facilities furnished by this institution.

Obituary.

EDWARD PARRISH.

In announcing the death of this eminent man we feel a genuine sorrow, which, we are assured, will be shared by all our readers. There are few pharmacists who are not familiar with the name of Professor Parrish, and who will not deplore, with heartfelt regret, the loss of one to whom we are all so much indebted. The sad event took place on September 9th, at Fort Sill, a remote post in the vicinity of the Choctaw Indians, whither Professor Parrish had been sent by the United States Government to deliver a message of peace to the warlike tribes of that section of country. The rough journey, and the hardships incident to it, together with the extreme heat of the weather, exercised a prostrating effect on one so little inured to such influences. On his arrival at the house of an Indian agent, near Fort Sill, he had already been seized with malarial fever, which then assumed a typhoid character, and in a few days terminated in death.

We have only been able to learn a few details of the early life of Edward Parrish. He was the son of Dr. J. Parrish, of Philadelphia, and was born in the year 1822. When about sixteen years of age he was placed with his brother, a pharmacist, in order to acquire a knowledge of that business. In 1842 he graduated at the Philadelphia College of Pharmacy, and shortly after commenced business; but a few years after he relinquished this in order to become a partner with his brother, and in this position he continued until the period of his death.

In addition to ordinary business engagements he entered upon that line of professional duties which rendered his name so well known. About twenty years ago he opened a school of practical pharmacy, chiefly adapted to the requirements of medical students. Feeling the want of a text book relating to his adopted avocation, he commenced writing a treatise on pharmacy, which was finally published, and having run through several editions, has become the best English work we have upon the subject. On the decease of the professor of *materia medica* in the Philadelphia College,

Professor Parrish was elected to fill the position. Soon after he exchanged this for the chair of practical pharmacy, as being more congenial to his tastes.

As a member of the American Pharmaceutical Association, he occupied a prominent position, and his contributions to periodical scientific literature have frequently been brought before our readers. Although we presume he was not present at the meeting of the Association in September last, a paper, of which he was the author, was presented and read. Strangely enough, it was on "Pharmaceutical Education"—a subject always nearest the heart of the writer—and stranger still, it must have been read almost at the time of his death. Truly, the professor may be said to have "died in harness."

Prof. Parrish has not long survived his wife, who died a few months ago. The family which remains consists of four sons and a daughter, who have, we are sure, the sincere sympathy of every pharmacist both in the United States and Canada.

JOHN CARGILL BROUGH, F.C.S.

This gentleman, who was personally known to some of our readers, and known by reputation to all, died at Esher, England, on September 7th. For some months he had been suffering from ill health, and though quite a young man, it was evident that his life was fast declining. The allotted time was short—thirty-eight years—and the earthly career of the indefatigable worker, the brilliant journalist, the zealous chemist, forever closed.

Mr. Brough was born at Pontypool, and was the son of a brewer of that place. He was a younger brother of the "Brothers Brough," well known in literary and dramatic circles. In his younger days he was employed in the office of the *Illustrated London News*, and afterwards was connected with the *Morning Star*. He subsequently became editor of the *Chemist and Druggist*, in which capacity he was best known to Pharmacists.

Better than anything we can say to his memory is the tribute from the pen of Mr. Joseph Ince, which we now transcribe for our readers:—

"Shall we seek to analyse the secret of the the personal fascination which was his gift, and to explain the mystery of his varied friendships? Perhaps the shadow of constant illness borne with unbroken cheerfulness, inspired a certain mixed feeling of compassion and

esteem; possibly his very weakness lent an added grace to that delicate wit many of us so well remember. His, influence, however, had a deeper spring, partly derived from his considerate allowance of the views of others and their wishes, and his abundant sympathy with their pursuits; partly also, that to this happy mental constitution was joined extreme refinement and intellectual culture. Where and when or how he gained his knowledge we really cannot say; nothing would more surprise those who had seen Mr. Brough only under his social aspect to discover the amount of solid learning he possessed. He was an indefatigable reader, blessed with a retentive memory, and the order of his mind was strictly mathematical. The study and practice of mathematics formed his relaxation, to which was owing the clearness of his abstract writing. Still the large heart, with its large allowance for everybody and everything, was the attraction, and it was this that made his home the centre of such widely different people. Angles were wanting in his character, and he spread round him an atmosphere in which quarrels could not exist. He was universally called Jack. The Archbishop of Canterbury, in a consecration service would have called him Jack, and so would the Pope of Rome, and both would have loved him. Yet Brough the editor, the chemist and the writer was a very different man from Brough in the character of Charles Lamb.

In the threefold departments mentioned his diligence was only equalled by his success. Think of a man whom no insurance office would accept, to whom Time gave no credit, having been editor of the *Chemist and Druggist*, editor of the *Laboratory*, sub-editor of *Nature*, editor of the *Ironmonger*, and the first elected editor of the Year Book, being at the same time reporter of scientific lectures, and general contributor to the press. Is it wonderful that he too rapidly broke down, that his last arrangements consisted in the constant refusal of work offered, or that, in his own words, I had to abandon many things, and *Nature*, to preserve my life?

"Mr. Brough valued the title of honor F.C.S. appended to his name, particularly as it was bestowed at a period of some excitement, when the election of a Fellow was severely scrutinized. Nothing is to be regretted more than that circumstances forbade him to devote his energies to original research, in which field of study he had so keen an interest, and for whose successful prosecution he was so specially qualified. But recently he became librarian of the London Institution. There his talents, under genial shelter, had full scope for their exhibition. His mechanical knowledge of desk-work, his capacity for attracting men of eminence, his wonderful knowledge and love of books all united in his favor. But the dark shadow that had never left his path drew near—the trembling hand was unclasped, and success, scarcely grasped, fell from it. The future, with its new-born hopes of prosperity and usefulness, was not to be. *Fiat Dei Voluntas.* Farewell John Cargill! very pleas-

ant was thy life to many. The grave may hide all that is mortal, but it cannot shut out the memories of the past, nor suppress the crowd of endearing recollections that arise as we think on him to whom were richly granted "wisdom and largeness of heart," and to whom but a few days ago the Master said, "Well done good and faithful servant, enter into thy Lord's joy."

Editorial Summary.

A MILLENIAL WASP.—The *Medical and Surgical Reporter* says that at the meeting of the British Association, Sir John Lubbock exhibited one of the strangest domestic pets ever heard of. It was a tame wasp which had been in his possession for about three months. The wasp was now quite tame, though at first it was rather too ready with its sting. It now ate sugar from his hand and allowed him to stroke it. The wasp had every appearance of health and happiness; and although it enjoyed an "outing," occasionally, it readily returned to its bottle, which it seemed to regard as a home.

PURE MUSK.—It is generally believed that this article may best be obtained by purchasing the musk in the bag. This view is opposed by M. Chr. Kunrz, (*Vierteljahrschrift für Pharm.*), who states that the pods are more liable to adulteration than the powder. Although one would think that the musk in its natural receptacle would prove the most difficult to imitate, yet the ingenuity of dealers has proved fully equal to the task, and, from the statements of the author, it seems that the purest musk is, most generally, to be found in a powdered form.

CONSTITUENTS OF CEPHALANTHUS OCCIDENTALIS.—This shrub, which is common in Canada, and is known as button-bush, or pond dogwood, has been examined by Mr. F. Reppert (*Michigan University Journal*). The bark has been found to contain a bitter resin, a bitter neutral principle, a neutral fluorescent principle, volatile oil, fixed fat, pectin, gum, starch and grape sugar.

DEPOSIT OF SALTPETRE.—It is stated by the Rev. F. Moigno that, at the lowest calculation, the nitre beds of Tamarugal, extend over 483 square miles, and contain 63,000,000 tons. At the present rate of consumption this quantity would last over one thousand years. It is stated that even larger quantities than this exist at the base of the Cordilleras.

Practical Formulæ.

Black Walnut Stain.—In a former number we recommended for this purpose a solution of permanganate of potash. The addition of sulphate of magnesia is said to give superior results. The proportions are as follows:

Permanganate of potash	3 ounces.
Sulphate of magnesia	3 ounces.
Hot water	4 pints.

Apply by means of a brush, and repeat until the desired color is produced.

Tooth Powder.—Enderlein prepares a tooth powder, of a beautiful red colour, as follows: 40 p. cochineal, 30 p. alum, and 320 p. cream of tartar are mixed with sufficient water, and the mixture heated for several hours in the steam-bath. 250 p. cuttlefish bone are then added, the mixture is exsiccated and powdered, and the powder levigated with sufficient oil of almonds until it acquires a velvety appearance. A suitable perfume is attar of rose, or a mixture of one part of attar of rose and 2 p. oil of peppermint. *Pharmac. Zeitung*, 1872, *No.* 53.

Chemical Plants.—Take a glass tumbler, fill it with white or better, pure yellow sand to the height of two inches, and pour on a mixture of equal parts of silicate of potash (water-glass) and distilled water. Then drop in small lumps of different metallic salts, as sulphate of copper, sulphate of iron, sulphate of zinc, bichromate of potassa, and so on, being careful that no two pieces are touching. In a few hours there will grow up small stems and hair-like threads, filling the whole tumbler as far as the mixture goes.—*Correspondent of Drug. Circular.*

To Coat Steel with Silver.—In order to deposit silver upon steel it is necessary to first coat the article with copper. The solution which I have found to answer best for this purpose is composed of

Carbonate of potassa	4 ounces.
Sulphate of copper	2 "
Liquid ammonia (about)	2 "
Cyanide of potassium	6 "
Water (about)	1 gallon.

Dissolve the sulphate of copper in boiling distilled or rain water,

and when cold add the carbonate of potassa and ammonia. The precipitate when formed is redissolved. Now add cyanide of potassium until all the blue color disappears. Then filter, and work the solution warm with active battery power, using a copper anode. After the article has received a sufficient coating it may be scratch-brushed, and is then ready for the silvering solution.—*Dental Cosmos.*

To Purify Tannic Acid.—M. Heinz states that commercial tannin owes its odor to a greenish resin, and that it may be rendered inodorous in the following way:—Dissolve the tannin in twice its weight of hot water. Introduce the solution into a glass vessel, and add one and a half parts of ether for every six parts of tannic acid. The mixture is greenish and turbid. After some hours the coagulated coloring matter precipitates, and the clear solution may be evaporated.—*Jour. Pharm. et de Chemie, in New Remedies.*

Varieties.

VEGETABLE PARCHMENT.—A foreign scientific paper says:—The common method of preparing this exceedingly useful material requires much care and experience on the part of the operator, and only gives satisfactory results when the strength of the sulphuric acid and the length of the process are actually proportioned to the substance and texture of unsized paper to be dipped. Mr. Colin Campbell has made a modification of this process, which promises many advantages. Before treating the paper with sulphuric acid, he dips it with a strong solution of alum and dries it thoroughly. When paper thus prepared is passed through concentrated sulphuric acid, it is converted into parchment paper, just as before, but the presence of the alum prevents the action of the acid being so rapid as before, and therefore renders the whole operation more manageable. Paper which has been printed on can also be converted into parchment if treated in that way. The author also proposes to make parchment paper in endless lengths by connecting the alum and sulphuric acid bath with the paper machine.—*Jour. Applied Chemistry.*

BED OF GLAUBER'S-SALT.—A deposit of Glauber's-salt has lately been discovered in the Caucasus, not very far from Tiflis and Narienfeld. In sinking a shaft the experimenters first passed through one foot of marl, two and a half feet of gray moist clay, seven of dark-gray bituminous saline clay, then penetrated a bed of pure Glauber's-salt to a depth of five feet, with a probability that the thickness was much greater. In the same region there are various lakes filled with solutions of Glauber's-salt, which furnish the apothecaries of that neighborhood with what they need of that substance, as it crystallizes in perfect purity along the edge of the water. —*Harpers Monthly.*

DRUGS, MEDICINES, &c.	$ c.	$ c.
Acid, Acetic, fort	0 12 @	0 14
Benzoic, pure	0 25	0 35
Citric	1 40	1 50
Muriatic	0 05	0 06
Nitric	0 11½	0 15
Oxalic	0 35	0 40
Sulphuric	0 03¾	0 07
Tartaric, pulv	0 50	0 50
Ammon, carb. casks	0 22	0 22
" jars	0 22	0 22
Liquor, 880	0 22	0 25
Muriate	0 12½	0 15
Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
Nitrous	0 35	0 37
Sulphuric	0 50	0 50
Antim. Crude, pulv	0 13	0 17
Tart "	0 60	0 65
Alcohol, 95 per ct.....Cash	1 60	1 72
Arrowroot, Jamaica	0 16	0 22
Bermuda	0 45	0 65
Alum	0 02¾	0 03½
Balsam, Canada	0 40	0 42
Copaiba	0 77	0 80
Peru	3 80	4 00
Tolu	0 40	1 00
Bark, Bayberry, pulv	0 18	0 20
Canella	0 17	0 20
Peruvian, yel. pulv	0 42	0 50
" red "	2 10	2 20
Slippery Elm, g. b	0 15	0 20
" flour, packets	0 28	0 32
Sassafras	0 15	0 15
Berries, Cubebs, ground	0 20	0 25
Juniper	0 06	0 10
Beans, Tonquin	0 62	1 10
Vanilla	28 00	28 00
Bismuth, Alb	3 50	4 00
Carb.	3 75	4 00
Camphor, Crude	0 38	0 40
Refined	0 50	0 55
Cantharides	2 70	3 00
Powdered	2 80	10
Charcoal, Animal	0 02	06
Wood, powdered		15
Chiretta	20	0 30
Chloroform	1 25	1 65
Cochineal, S. G	0 80	0 95
Black	1 10	1 20
Colocynth, pulv	0 50	0 60
Clelodion	0 67	2 70
Elaterium.....oz	4 50	5 00
Ergot	0 65	0 75
Extract Belladonna	2 20	2 50
Colocynth, Co	1 25	1 75
Gentian	0 50	0 60
Hemlock, Ang	1 12	1 25
Henbane, "	1 70	2 00
Jalap	5 00	5 50
Mandrake	1 75	2 00
Nux Vomic.....oz	0 60	0 70
Opium.....oz	1 10	—
Rhubarb	7 50	—
Sarsap. Hon. Co	1 00	1 20
" Jam. Co	3 25	3 70
Taraxicum, Ang	0 70	0 80
Flowers, Arnica	0 25	0 35
Chamomile	0 32	0 40
Gum, Aloes, Barb. extra	0 70	0 80
" " good	0 38	0 50
" Cape	0 16	0 20
" " powdered	0 20	0 30
Socot	0 5[illegible]	80
" " pulv	0 60	90
Arabic, White	0 60	0 65
" powdered	0 50	0 75
" sorts	0 28	0 30
" " powdered	0 42	0 50
" com. Gedda	0 13	0 16
Assafœtida	0 40	0 42
British or Dextrine	0 13	0 15
Benzoin	0 48	0 55
Catechu	0 12	0 15
" powdered	0 25	0 30
Euphorb, pulv	0 32	0 40
Gamboge	1 05	1 20
Guaiacum	0 25	0 78
Myrrh	0 42	0 60

DRUGS, MEDICINES, &c.—*Contd.*	$ c.	$ c.
Sang Dracon	0 60	0 70
Scammony, powdered	6 50	6 75
" Virg. "	14 50	—
Shellac, Orange	0 50	0 60
Gum, Shellac, liver	0 50	0 52
Storax	0 65	0 75
Tragacanth, flake	1 10	1 40
" common	0 35	0 40
Galls	0 27	0 32
Gelatine, Cox's 6d	1 10	1 20
Glycerine, common	0 30	0 35
Vienna	0 30	0 40
Prices	0 60	e 75
Honey, Canada, best	0 15	0 17
Lower Canada	0 14	0 16
Iron, Carb. Precip	0 17	0 20
" Sacchar	0 40	0 55
Citrate Ammon	1 50	1 50
" & Quinine, oz	0 56	0 60
" & Strychine "	0 17	0 25
Sulphate, pure	0 08	0 10
Iodine, good	12 50	—
Resublimed	15 00	—
Jalapin	1 25	1 50
Kreosote	2 00	2 10
Leaves, Buchu	0 22	0 30
Foxglove	0 25	0 30
Henbane	0 35	0 40
Senna, Alex	0 30	0 60
" E. I	0 12½	0 20
" Tinnevilly	0 20	0 30
Uva Ursi	0 15	0 15
Lime, Carbolate.....brl	5 50	—
Chloride	0 06	0 07
Sulphate	0 08	0 12½
Lead, Acetate	0 14	0 15
Leptandrin.....oz.	0 60	—
Liq. Bismuth	0 50	0 75
Lye, Concentrated	1 75	2 00
Liquorice, Solazzi	0 50	0 55
Cassano	0 23	0 40
Other brands	0 14	0 25
Liquorice, Refined	0 35	0 45
Magnesia, Carb. 1 oz.	0 20	0 25
" 4 oz.	0 17	0 20
Calcined	0 65	0 75
Citrate.....gran.	0 45	0 50
Mercury	1 25	1 30
Bichlor	1 15	—
Chloride	1 35	—
C. Chalk	0 60	—
Nit. Oxyd	1 45	—
Morphia Acet	4 00	4 25
Mur.	4 00	4 25
Sulph	4 25	4 50
Musk, pure grain.....oz	22 00	—
Canton	0 00	1 20
Oil, Amonds, sweet	0 45	0 52
" bitter	14 00	15 00
Aniseed	4 25	4 50
Bergamot, super	5 75	6 00
Carraway	4 00	4 20
Cassia	2 40	2 50
Castor, E. I	0 15	0 15
Crystal	0 22	0 25
Italian	0 26	0 28
Citronella	1 35	1 50
Cloves, Ang	1 75	2 00
Cod Liver	1 0	1 50
Croton	1 75	2 00
Juniper Wood	0 80	1 00
Berries	6 00	7 00
Lavand, Ang.....oz.	0 90	1 00
Exotic	1 40	2 60
Lemon, super	5 00	5 50
ord	3 20	3 40
Orange	5 25	5 50
Origanum	0 65	0 75
Peppermint Ang	13 00	14 40
" Amer	3 25	3 50
Rose, Virgin	8 00	8 25
" good	5 75	6 00
Sassafras	1 15	1 40
Wintergreen	6 00	6 50
Wormwood, pure	4 00	6 50
Ointment, blue	0 90	1 00
Opium, Turkey	8 50	8 75
pulv	10 25	10 50

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 30	0 36
" good	0 12½	0 20
Pill, Blue, Mass	1 00	1 00
Potash, Bichrom	0 23	0 27
Bi-tart	0 30	0 32
Carbonate	0 14	0 20
Chlorate	0 65	0 70
Nitrate	10 50	11 00
Potassium, Bromide	1 40	1 60
Cyanide	0 75	0 80
Iodide	11 50	11 75
Sulphuret	0 25	0 35
Pepsin, Boudault's oz	1 50	—
Houghton's doz	8 00	9 00
Morson's oz	0 85	1 10
Phosphorus	0 75	0 85
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 50	—
" 100 oz. case	2 45	—
" 25 oz. tin	2 40	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 17	0 20
Elecampane	0 16	0 17
Gentian	0 10	0 12½
" pulv	0 15	0 20
Hellebore, pulv	0 17	0 20
Ipecac, "	2 20	2 30
Jalap, Vera Cruz	1 00	1 25
" Tampico	0 70	1 00
Liquorice, select	0 12	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	2 50	2 75
" E. I	1 10	1 20
" " pulv	1 20	1 30
" " 2nd	0 90	1 00
" French	0 75	—
Sarsap., Hond	0 40	0 45
" Jam	0 88	0 90
Squills	0 10	0 15½
Senega	1 35	1 50
Spigelia	0 40	0 45
Sal., Epsom	2 25	3 00
Rochelle	0 32	0 35
Soda	0 02½	0 03
Seed, Anise	0 13	0 16
Canary	0 05	0 06
Cardamon	3 25	3 75
Fenugreek, grd	0 09	0 10
Hemp	0 08½	—
Mustard, white	0 14	0 16
Saffron, American	1 25	1 50
Spanish	15 00	17 00
Santonine	9 00	10 00
Sago	0 08	0 09
Silver, Nitrate Cash	14 85	16 50
Soap Castile, mottled	0 11	0 14
Soda Ash	0 04	0 05
Bicarb. Newcastle	6 25	6 50
" Howard's	0 14	0 16
Caustic	0 06¼	0 06½
Spirits Ammon., arom	0 25	0 35
Strychnine, Crystals	2 20	2 50
Sulphur, Precip	0 10	0 12½
Sublimed	0 03½	0 05
Roll	0 03	0 03½
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 75	0 80
Zinc. Chloride oz	0 10	0 15
Sulphate, pure	0 10	0 15
" common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
Analine, Magenta, cryst	3 00	4 00
" liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 10	0 10
Camwood	0 06	0 09
Copperas, Green	0 01½	0 02½
Cudbear	0 16	0 25
Fustic, Cuban	0 02¼	0 04
Indigo, Bengal	2 40	2 50
Madras	0 95	1 10
Extract	0 30	0 35

DYESTUFFS—*Continued.*		
Japonica	0 06½	0 06½
Lacdye, powdered	0 33	0 38
Logwood	0 02	0 03
Logwood, Camp	0 02	0 3½
Extract	0 10	0 14
" 1 lb. bxs	0 14	—
" ½ lb. "	0 15	—
Madder, best Dutch	0 15	0 17
2nd quality	0 14	0 16
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 11½@	0 12
Cassia	0 38	0 40
Cloves	0 18	0 18
Cayenne	0 18	0 25
Ginger, E. I	0 12	0 14
Jam	0 20	0 30
Mace	1 75	1 75
Mustard, com	0 20	0 25
Nutmegs	1 15	1 20
Pepper, Black	0 22½	0 23
White	0 40	0 42
PAINTS, DRY.		
Black, Lamp, com	0 07 @	0 08
" refined	0 25	0 30
Blue, Celestial	0 08	0 12
Prussian	0 65	0 75
Brown, Vandyke	0 10	0 12½
Chalk, White	0 01	0 01½
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 30	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07	0 08
Venetian	0 02½	0 03½
Sienna, B. & G	0 10	0 15
Umber	0 07	0 10
Vermillion, English	1 25	1 30
American	0 25	0 35
Whiting	0 85	0 90
White Lead, dry, gen	0 08	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 12½	0 35
" Ochre	0 02½	0 03½
Zinc White, Star	0 10	0 12
COLORS, IN OIL.		
Blue Paint	0 12 @	0 15
Fire Proof Paint	0 06	0 08
Green, Paris	0 30	0 37½
Red, Venetian	0 07	0 10
Patent Dryers, 1 lb tins	0 11	0 12
Putty	0 03½	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 25	—
" No. 1	2 05	—
" No. 2	1 85	—
" No. 3	1 65	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	5 00 @	5 25
Resin, Strained	5 50	—
Clear, pale	7 80	—
Spirits Turpentine	0 78	0 80
Tar Wood	5 00	5 25
OILS.		
Cod	0 63 @	0 65
Lard, extra	0 95	—
No. 1	0 90	0 95
No. 2	0 85	0 90
Linseed, Raw	0 80	0 85
Boiled	0 85	0 90
Olive, Common	1 25	1 35
Salad	1 80	2 30
" Pints, cases	4 20	4 40
" Quarts	3 25	3 50
Seal Oil, Pale	0 80	0 80
Straw	0 70	0 75
Sesame Salad	1 30	1 35
Sperm, genuine	2 15	2 40
Whale, refined	0 90	0 95