TABLE I.—*Showing the Fall in Concentration of the Vapour after Douches on Different Fabrics; Amplitude of Aspirations, 500 cubic centimetres; Frequency, 20 per minute throughout the Series.*

Chloroform used.	Number of aspirations before sampling.	Concentration of vapour.	
		With close fabric on mask (flannel).	With open fabric (domett).
1 c.c. douche.	5	1.0 per cent.	1.6 per cent.
" " "	10	1.0 "	1.5 "
" " "	20	0.8 "	1.0 "
3 " "	5	2.4 "	2.9 "
" " "	10	1.7 "	2.3 "
" " "	15	1.6 "	2.1 "

TABLE II.—*Showing the Effect of Varying the Quantity of Chloroform applied to the Mask.*

Chloroform applied.	Amplitude of aspiration.	Frequency of aspiration.	Concentration of vapour.
10 drops per min.	350 c.c.	10 per min.	0.65 per cent.
20 " "	" "	" "	1.0 "
30 " "	" "	" "	1.4 "
40 " "	" "	" "	2.0 "
43 " "	" "	20 "	1.1 "
55 " "	" "	" "	1.2 "
66* " "	" "	" "	1.4 "
1† c.c. douche.	400 "	10 "	1.7 "
" " "	" "	" "	2.1 "
3 " "	" "	" "	2.5 "

* 65 drops from the burette employed = one cubic centimetre.
† The estimations in this series were made after ten aspirations.

The concentration of chloroform in the densimeter did not increase proportionally to the amount applied to the mask.

TABLE III.—*Showing the Effect of Varying the Frequency of Aspiration with Amplitudes constant in each Set of Trials.*

Amplitude of aspiration.	Frequency of aspiration.	Chloroform used.	Concentration of vapour.
500 c.c.	10 per min.	3 c.c. douche.	3.2 per cent.
" "	20 "	" "	2.8 "
600 "	10 "	45 drops per min.	1.2 "
" "	20 "	53 " "	0.95 "
" "	30 "	59 " "	0.8 "
350 "	10 "	4.5 c.c. dropped per min.	4.2 "
" "	20 "	4.25 " "	3.0 "
" "	30 "	5 " "	3.1 "

For a given quantity of chloroform used greater frequency led to lower concentration.

TABLE IV.—*Showing the Effect of Varying the Amplitude with Frequencies constant in each Set of Trials.*

Amplitude of aspiration.	Frequency of aspiration.	Chloroform used.	Concentration of vapour.
350 c.c.	20 per min.	55 drops per min.	1.2
700 "	20 "	69 " "	1.0
400 "	10 "	2 c.c. douche.	2.1
800 "	10 "	2 " "	2.0
400 "	10 "	3 " "	2.5
800 "	10 "	3 " "	2.2

For a given quantity of chloroform used, greater amplitude led to lower concentration. The effect of varying amplitude

is, however, less marked than that of varying frequency (compare Table III.).

From these experiments it appears that at ordinary room temperatures with moderate and approximately equal quantities of chloroform the Skinner mask yielded vapour of fairly uniform concentration between the desirable limits of 1 and 2 per cent., but reaching as high as 3 or 4 per cent. when the chloroform was copiously applied. The more open of the two fabrics employed gave vapour of higher and, with douches, less uniformly sustained concentration than the closer one. Aspirations of lower frequency and smaller volume led to greater concentration. Comparison of the drop and douche methods showed that a desired concentration is as certainly attained and more uniformly sustained by the former than by the latter.

It is obviously not legitimate to assume that a given quantity of chloroform, whether by drop or douche, would necessarily yield to the human subject vapour of concentration identical with that found above, even if respiration tallied in depth and frequency with the aspiration employed. It is, however, reasonable to conclude that changes in respiration will produce variations in concentration in the same sense as similar variations in physical aspiration, and to emphasise the caution that fall in frequency and depth of respiration may lead to inhalation of dangerously concentrated vapour, even when the amount of chloroform used is apparently not excessive.

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THE MEDICINAL PEROXIDES HOPOGAN AND EKTOGAN.

By DR. M. FRENKEL.

WHEN presenting these chemical bodies for the first time to the medical world, in a lecture before the Société de Médecine in Paris about 18 months ago, I felt inwardly convinced of the great therapeutic importance of these preparations, a conviction, however, which was based only upon chemico-physiological facts, such as had been referred to in periodical medical literature.¹

Hopogan is a peroxide of magnesium and ektogan is a peroxide of zinc. Both bodies are very rich in oxygen and their formulæ MgO₂ and ZnO₂, as well as their reaction when tested, show the greatest analogy. Both are definite chemical products exhibiting a constant composition. Both peroxides are producers of oxygen in a very active state. In hopogan, which is destined for internal use, the oxygen is combined with a mild base, magnesia; whilst in ektogan, which is destined for external, surgical, and dermatological application, the oxygen is combined with oxide of zinc. The action of the two peroxides which manifests itself physiologically in their peculiar antiseptic qualities is identical. Hopogan is suitable for use as an internal antiseptic, an anti-fermentative for abnormal stomachic and intestinal fermentations. It differs from other internal antiseptics on account of its non-poisonous, non-astringent, and yet powerful germicidal action. The moment that hydrogen peroxide is formed from the magnesium peroxide and acts on the abnormal fermentation-excitors and fermentation-products it is reduced to water, leaving harmless magnesium salt behind. According to Professor Gilbert, clinical experience shows that no acid is required to liberate the active oxygen contained in hopogan but that the ferments existing in the intestinal juice readily bring about the decomposition of the hopogan and the antiseptic effect connected therewith.

Speaking of clinical results, the trials made by Professor Albert Robin² seem to show distinctly that hopogan is a specific anti-fermentative and according to its action the probable origin of diarrhoea may be determined. If diarrhoea is caused through abnormal fermentations hopogan acts with absolute certainty, effecting most rapidly intestinal disinfection and reducing, within 24 hours, for instance, the number of motions from 12 to two of normal condition. On the other hand, Professor Robin says that in cases of

¹ THE LANCET, July 26th (p. 252) and Sept. 6th (p. 678), 1902, and Jan. 2nd (p. 35), 1904; Brit. Med. Jour., Jan. 24th, 1903; Medical Review, May, 1904; and Medical Times and Hospital Gazette, March 15th, 1904.
² Bulletin de la Société de Thérapeutique de Paris, 1904, No. 6, p. 178.

diarrhoea of serous or vaso-motorial, or nervous, or tuberculous origin hopogan frequently does not act. This result differs from the one which Professor Gilbert⁴ obtained with hopogan. He distinctly says that the peroxide "*ne s'est pas montré seulement actif dans les affections gastriques, mais nous avons constaté ses bons effets dans le traitement de la diarrhée en particulier chez les tuberculeux.*"

Further observations are needed in order to decide whether hopogan acts as a general anti-diarrhoeic or exclusively as an anti-fermentative anti-diarrhoeic. Professor Robin, however, describes one case of diarrhoea with phthisis and one with pleurisy successfully treated with hopogan, whilst Professor Gilbert observed rapid success in 11 cases of diarrhoea out of 16 treated with hopogan. The result was negative in one case of tabes dorsalis and in one case of carcinoma of the pancreas in the last stage. In the cases above referred to hopogan was prescribed in the form of keratine capsules in order to obtain the full effect of the active oxygen in the intestines. But with the keratine capsules Professor Robin also combined the treatment with hopogan powder. The dose may be increased from one to three grammes per day.

Professor Gilbert has made numerous trials with hopogan powder and tablets in cases of affections of the stomach produced by abnormal fermentations and in 20 cases out of 22 he has obtained very favourable results. The following conditions were treated: constantly furred tongue, bad taste in the mouth, odourless as well as fetid belching, eructations, sickness, vomiting, and flatulence in the epigastrium accompanied by oppression of the heart after meals. Improvement took place soon after the first or second day, but in order to obtain lasting results the treatment had to be continued for two or three days after disappearance of the last symptoms of illness. During the trials the food of the patients was not modified. Against pains in cases of gastritis alcoholica the preparation was effective in three out of eight. In cases of tuberculous or neoplastic anorexia the result was always negative. Professor Gilbert concludes that it is absolutely due to the oxygen *in statu nascendi* that hopogan has such good effect.

With regard to the action of ektogan Dr. Chaput expresses himself just as categorically. In the treatment of wounds he reported to the Paris Surgical Society some remarkable results. The principle of antiseptics by means of active oxygen is here effectively carried out. The manner of applying the preparation may be in the form of ektogan powder, ointment, or gauze. I will not dwell here upon the details of the copious report and must refer the reader to the original.⁴ Suffice it to say that Dr. Chaput concludes his remarks as follows: "Ektogan (peroxide of zinc) is an excellent remedy for the treatment of surgical wounds. It is neither toxic nor caustic; it can be sterilised by heat. When in touch with wounds it develops oxygen continuously. In form of powder, gauze, or ointment it gives excellent results in treatment of aseptic or infected wounds, torpid wounds, eczema, and dermatitis. For uterine and vaginal bandages, ektogan is an advantageous substitute for aseptic and iodoform gauze." It is odourless.

It is satisfactory to find that the good effect of remedies as anticipated by their chemico-physiological behaviour is realised in practical application.

Honfleur, France.

ON THE FREQUENCY OF ASEPTIC NECROBIOSIS OR RED DEGENERATION OF FIBROMYOMATA OF THE UTERUS.

WITH A REPORT OF TWO CASES.

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THE ordinary hard fibromyoma of the uterus presents to the naked eye on cross section a white, glistening, satin-like, whorled appearance which along with its distinct and well-marked encapsulation and its contrast with the surrounding pale pink myometrium is striking and characteristic. Equally

striking and characteristic is the appearance presented on cross section of a uterine fibromyoma which is undergoing aseptic necrobiosis or red degeneration. The tumour is usually single, with a well-marked capsule, is softish in consistency, distinctly red, mahogany or liver-coloured, fleshy looking, and loose textured, having been compared to raw beef steak. It will thus be evident that attention is immediately attracted to this condition on making a section of such a tumour, for there is nothing in its external appearance before section to indicate its nature. Hence it is remarkable how little attention has been paid to the latter condition, for in the majority of the gynaecological textbooks there is not even the slightest hint that this condition does occur.

The subject has, however, been so recently and so fully described by Dr. J. S. Fairbairn, both from a pathological and from a clinical standpoint, in a paper entitled "A Contribution to the Study of one of the Varieties of Necrotic Change, the so-called Necrobiosis in Fibromyomata of the Uterus" in the *British Journal of Obstetrics and Gynaecology* for August, 1903, that nothing remains to be added to his description and it is therefore unnecessary again to describe the condition. I would rather limit my few remarks, therefore, to the frequency with which it is found.

The only published statistics that I can find in this connexion are those contained in Dr. Fairbairn's paper, which is chiefly based on material obtained in the pathological department of the Chelsea Hospital for Women. During Dr. Fairbairn's tenure of the office of pathologist 105 specimens of uterine fibromyomata were examined in the pathological laboratory and of these ten, or 9.5 per cent., were affected in this way. During the last two years the pathological department of this hospital has been under my charge and 124 specimens of fibromyoma of the uterus have been examined and only two, or 1.6 per cent., were found showing this condition. These figures, along with those from the gynaecological wards of St. Thomas's Hospital, quoted by Dr. Fairbairn may be tabulated thus:—

	Number of fibromyomata examined.	Number of fibromyomata showing necrobiotic changes.	Percentage affected.
St. Thomas's Hospital, } 1897-1901 }	88	7	8.0
Chelsea Hospital for } Women, Series I. ... }	105	10	9.5
Chelsea Hospital for } Women, Series II. ... }	124	2	1.6
Total... ..	317	19	6.0

Thus we have a total of over 300 specimens of fibromyomata of the uterus examined which is, I think, a sufficiently large number to give an approximately correct estimate of the frequency with which these tumours undergo necrobiotic changes, and this works out to very nearly 6 per cent.

The two cases showing this condition in the second series from the Chelsea Hospital for Women (for permission to record which I am indebted to the kindness of Dr. W. H. Fenton and Dr. W. F. Victor Bonney) are as follows.

CASE 1.—A married woman, aged 44 years, was admitted into the Chelsea Hospital for Women on Jan. 8th, 1904, under the care of Dr. Fenton, complaining of menorrhagia, metrorrhagia, burning sensations in the lower abdomen, and pain in the back on sitting. Menstruation commenced at the age of 18 years and was quite regular until marriage at the age of 24 years. The performance of this function has always been attended with much pain. The patient had been married 20 years and had had no children but four miscarriages. Ever since marriage menstruation had been very irregular, generally occurring every two or three weeks and scarcely ever going the full month. The loss had always been free and accompanied by clots and much pain. The condition had been much worse for the last 12 months, the flow gradually becoming more profuse until at last it became continuous. For two months before admission, however, there was complete amenorrhoea. For the last two years the patient had noticed a sensation of pressure in the sacrum on sitting and had had paroxysmal

³ Comptes Rendus de la Société de Biologie de Paris, 1904, No. 11, p. 486.

⁴ Bulletin de la Société de Chirurgie de Paris, 1904, No. 15, p. 437.