

ing the method of its application, and for the details of my experience with it since. The purpose of these notes is to answer such questions.

Although I did not recommend its use until long after I had discovered that the union of these two camphors resulted in a fluid of the chemic formula $C_{10}H_{18}O$, and after I had satisfied myself that we possessed a valuable remedy in this new drug, I am now able to express greater confidence, and to verify my former statements by the experience of others, as well as by my daily use of it up to the present time. The experimental stage has passed, and the efficacy of this medicine is clearly established. Specialists who were at first skeptical as to its virtue, have since adopted it as a standard remedy in both private and dispensary practice. I have taken pains to ascertain the results of their experiences, and add them to my own.

The field of application in which camphor-menthol has proved most efficacious is in the following diseases: coryza, hay fever, intumescent rhinitis (intermittent and alternating nasal stenosis), hypertrophic rhinitis, simple sore throat, acute laryngitis, tracheitis, bronchitis, and cauterizations to prevent hemorrhage and inflammation.

The indications for its use are made clear by a consideration of its physiologic action. It contracts the capillary blood vessels of the mucous membrane, reduces swelling, arrests sneezing and irritation, checks excessive discharges, and corrects perverted secretions.

For home use and ordinary office treatment, I do not employ a stronger solution than the 3 per cent. in lavolin, and for very sensitive cases, like hay fever sufferers, the 1 or 2 per cent. solution at first. The lavolin itself is a bland and soothing protective to the membrane, and in the combinations indicated we have undoubtedly the most effective and harmless remedy known. This means a great deal to both patient and physician, for most of the sprays in use give indifferent results—or worse. Indeed, so great has been the disappointment with the old local medicaments, that a well-known writer on nasal diseases entirely abandoned them several years ago.

Patients should be instructed to treat themselves thoroughly every night at bed time, by throwing a spray of the 3 per cent. solution from a lavolin atomizer into both nostrils while slowly inhaling. The rubber bulb should be forcibly and rapidly compressed at least eight times for each nostril. For the throat, larynx or bronchial tubes, the spray should be thrown through the mouth also during inhalation.

In diphtheria, croup, etc., in infants, when it is very difficult to throw a spray into the throat, the medicine may be made to reach the parts by volatilizing it, by placing a few drops of the pure undiluted camphor-menthol in hot water, and causing the patient to breathe the medicated steam, or a few drops can be heated in a spoon over a lamp, and its fumes will impregnate all the atmosphere of the room. Enough medicine need not be used to cause uncomfortable smarting of the eyes. Inflammation of the throat, larynx, trachea and bronchi can be effectually treated by inhaling the camphor-menthol steam from the benzoinol inhaler.

I have found that we can prevent hemorrhage and inflammation, following galvano-cauterization of the turbinated bodies, by gently packing a pledget of cotton wet with a 20 per cent. solution of the cam-

phor-menthol between the burned tissue and the septum, and leaving it there twenty-four or forty-eight hours. It is then replaced by a fresh dressing and, at the end of four or five days, instead of finding sloughs filling the passages, swelling and stenosis, the tissues appear shrunken and mummified, and the strait is clear. Unless the electrode has been allowed to cool before removing, no hemorrhage or only slight oozing occurs. There is also less discomfort following this method than after others. The cotton should not be saturated to dripping with the solution, so as to allow it to trickle down into the throat, and if too much is used, it occasions a copious serous secretion. Advantage of this power of the strong solution to cause stimulation of the glands, and osmosis, can be taken in treating ozena and dry catarrh of the nose and throat. The weak solutions diminish secretions; the strong ones increase them.

Much suffering can be prevented in people who take cold easily, by using the pocket camphor-menthol inhaler. Any one can easily construct it. I have them made, however, with an excess of camphor, while the pure camphor-menthol contains a larger proportion of menthol. By inhaling this for a moment, the instant the irritation of a cold is felt in the nose or throat, the attack can be stopped. Patients who carry these inhalers in their pockets are able to prevent colds during the seasons when they have heretofore suffered repeatedly.

In my first paper on this subject, I gave the directions for preparing this formula, but I have since come to prefer a preparation that is made more cheaply and elegantly for me by Truax, Greene & Co., of Chicago.

Columbus Memorial Building.

CLINICAL VALUE OF THE CHEMIC ANALYSIS OF GASTRIC JUICE.

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Professor Bourget, at Lausanne, being looked upon as authority on all questions concerning the chemistry of the stomach, was invited by the organizing committee of the French Congress for Medicine at Lyon, to give a full report of the named question. The result of his experience, gathered during a number of years from 354 patients, differs in many respects from the views of many physicians at the present time, and a sketch of his resumés must be of interest to the readers of the JOURNAL.

Bourget examines the contents of the stomachs of his patients before breakfast, and after a test meal of 200 cubic centimeters of beef tea, 80 grams of chopped meat and 40 grams of bread. After two and one-half hours of digestion, the stomach is emptied by the stomach tube, without aspiration, simply by the contraction of the muscles of the stomach, which under certain conditions is promoted by the insufflation of a small quantity of air. Having emptied in this manner the larger amount of the contents of the stomach, he pours 100 cubic centimeters of water into the organ and empties the same immediately after. By the analysis of the diluted, as well as the undiluted fluid, an exact measuring of the quantity of the contents of the stomach at the time of the experiment is possible. Beside this, an analysis of the acidity *in toto*, of the amount of free as well as combined hydrochloric acid, of organic acids, etc., is made. For

the examination of the total acidity with one-tenth strength of the normal caustic soda, Bourget prefers azolithmin to phenolphthalein, which is mostly used as an indicator, because the latter is unreliable in the presence of peptones. The relation of the acidity of the undiluted to the diluted gastric juice allows the correct estimation of the absolute quantity of acids. For the qualitative analysis of free acid, Bourget uses phloroglucin-vanilin or Boas' resorcin test, while for the quantitative HCl test he usually uses the method of Hazen and Winter.

In young individuals with healthy stomachs, free hydrochloric acid is *always* present. Even after a meal of 300 grams of meat, a percentage of 0.03 to 0.05 of free hydrochloric acid is found, while the quantity of combined hydrochloric acid fluctuates between 0.20 to 0.25 per cent. This gives the impression that the healthy mucous membrane of the stomach has the power to secrete such a quantity of this acid which is in proportion to the amount of nourishment, and that after the saturation of the bases and albuminates, a certain excess of free acid remains.

In all diseased conditions, which lower the activity of nutrition, as chlorosis, anemia, chronic nephritis, etc., the quantity of HCl is diminished. In chlorosis and anemia, free hydrochloric acid is often entirely absent. In neurasthenia great fluctuations are observed; the same patient can have hyperchlorhydria on one day and on the next day he may produce a distinctly hypochlorhydric gastric juice, according to his momentary mental disposition. During the periods of depression, the quantity of hydrochloric acid is usually diminished. In cases of gastrectasis and gastropnoia, the secretion of HCl seems to depend on the motility of the stomach. As long as the stomach is emptied in the normal way, the condition of the gastric juice is almost normal, even in well marked dislocations of the organ. If, on the other hand, the motility of the stomach is insufficient, the juice is also altered by-and-by; free hydrochloric acid disappears first, while the percentage of combined acid diminishes later on.

For some time it was thought that in malignant tumors of the stomach, especially in carcinoma, the absence of free hydrochloric acid was almost a pathognomonic symptom of this disease. That this in fact is not the case is proved by the observations of Bourget, who found free hydrochloric acid in nine cases out of twenty-five of carcinoma of the stomach.

Hypochlorhydria is found in a large number of cases of dyspeptic trouble, which are usually described under the general name of gastritis. The quantity of free, as well as combined HCl, is increased; a quantity of 0.18 per cent. of free and of 0.26 per cent. of combined acid is not rarely found. In Reichmann's disease (continued hyper-secretion of gastric juice) the relative quantity of hydrochloric acid can be normal, or hypochlorhydria may exist; while in all such cases the total quantity of the acid is rather large. In one patient of this kind, Bourget found, for instance, after the test meal, 18 grams of concentrated HCl, with a specific gravity of 1.016, diluted in two quarts of gastric juice which had gathered in the stomach after the test meal.

There is always found a sufficient quantity of pepsin in any gastric juice; even in advanced cases of carcinoma the peptic power of the gastric juice is always sufficient. It was only in two cases of atrophy

of the mucous membrane of the stomach that Bourget could observe the absence of pepsin in the juice. The mercantile preparations of pepsin show a very high digestive power in the chemic test tube, but after the addition of pepsin to the physiologic gastric juice the digestive power of the latter is largely diminished, about one-half after the addition of 0.5 per cent. of pepsin.

Lactic acid is found in those cases where the contents of the stomach remain for a long time in this organ, especially when at the same time hypochlorhydria exists. This is often the case in carcinoma. Butyric and acetic acids are formed under similar conditions. The latter is often formed in Reichmann's disease, because different kinds of fungi of fermentation can very well exist in a 2 per cent. solution of hydrochloric acid.

Now then, what is the clinical value of the chemic analysis of gastric juice? Admitted that it gives some valuable information, we can not form a definite conclusion by it as to the activity of the stomach during digestion. It considers only one side of the question and leaves three points entirely untouched, which are of the greatest importance for the act of digestion:

1. The permanent secretion of gastric juice during the whole time of digestion.

2. The absorption by the mucous membrane of the stomach.

3. The emptying of the stomach into the intestine.

Furthermore, we are not allowed to judge as to digestion in general from the energy of the digestion of the stomach. The digestion of the stomach does not represent more, in a certain sense, than a preparation for intestinal digestion. The latter can be entirely sufficient to support life, while the digestive power of the stomach is impaired. The peptones which are formed in the stomach are not ready yet for assimilation according to the views of Bourget. After the subcutaneous or intravenous injection of peptones formed by the stomach, it was observed that they were eliminated by the urine, and plain symptoms of intoxication were found during this process. If, however, these gastric peptones had been brought in contact with intestinal juice for some length of time, no symptoms of intoxication were observed after their injection, and no peptones were found in the urine.

We also should be careful in our diagnostic conclusions from the chemic analysis of gastric juice. A positive diagnosis of Reichmann's disease only can be made by this analysis. In all other affections, especially in the different forms of gastritis, the chemistry of the stomach is so changeable that upon this alone no positive opinion should be based. In one and the same disease, at certain times, hyperacidity is found; at other times hypoacidity, and again at other times, normal conditions are observed. Sometimes, during the course of the same disease, the result of the chemic tests changes entirely—a primary hyperchlorhydria turning into hypochlorhydria. This goes to show that chemic analysis alone does not justify a positive diagnosis of disorders of the stomach. An examination of the motory action of the organ should never be omitted, because we can draw better conclusions by it as to the general disorders of digestion than by chemic examination only. In consequence of this, a classification of the diseases of the stomach based on the chemic test alone, should not be made. The most important

value of the chemic analysis of gastric juice is that it serves as a guide in therapeutic procedures. We will base on it our dietary and medicinal treatment, knowing if hydrochloric acid or alkalins are indicated in a given case.

Beside the observation of the chemic and motor activity of the stomach, the estimation of the position and size of the organ should never be forgotten. To this end, Bourget recommends insufflation of the stomach. Air is blown into the stomach until the patient perceives a certain sensation of pain, which will set in as soon as the stomach has reached the limit of its normal expansibility. A flabby belly exposes the border of the stomach to the eyesight directly, and it can be marked with a blue pencil, while in a tense and fatty abdominal wall the demarcation has to be made out by percussion. The quantity of the insufflated air indicates the size of the organ. A healthy stomach usually reacts after the insufflation of fifteen to eighteen hundred cubic centimeters of air, while in certain diseases it may receive as much as five quarts before the limit of the expansibility is reached. In this way we can easily differentiate between an ordinary dilatation of the stomach and gastroptosis, vertical dislocation, etc.

ERRORS OF REFRACTION.

A SYLLABUS OF THE LECTURE DELIVERED IN THE JANUARY EVENING COURSE TO THE PHYSICIANS OF THE SPECIAL OPHTHALMOLOGIC CLASS AT THE POST-GRADUATE MEDICAL SCHOOL.

BY FRANCES DICKINSON, M.D.
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These eighteen propositions will assist the beginner to more readily understand the many pages treating of the same subjects in all our text-books.

With a second lecture on the lenses which correct the errors of refraction, and a third lecture on the frames which hold the lenses which correct the errors of refraction, we will have completed the "House that Jack Built."

1. Three essentials to sight—Light; eye; brain.
2. Three characteristics of light; it proceeds—From every point; in every direction; along straight lines called *Rays*.
3. Three directions to rays of light—Parallel; divergent; convergent.
4. Three destinies for light—Absorbed; reflected; refracted.
5. Three varieties of forms of glass reflect light—Plane; prism; curved surfaces.
6. Three combinations of curved surfaces converge rays of light—Convex spherical; convex cylindrical; convex spherocylindrical.
7. Three combinations of curved surfaces diverge rays of light—Concave spherical; concave cylindrical; concave spherocylindrical.
8. Three refracting surfaces in the eye—Anterior surface of cornea; anterior surface of lens; anterior surface of vitreous.
9. The combined effect of the three refractive surfaces of the eye on the rays of light, be they parallel, divergent or convergent rays is to—Converge the rays; converge the rays alike in every meridian; converge the rays to a point focus; as would a convex spherical lens.
10. Three positions for the foci of all rays of light entering a convex spherical lens, *i. e.*, at, before, and behind the principal focus, or—Entering parallel rays are focused at the principal focus; entering

converging rays are focused before the principal focus; entering diverging rays are focused behind the principal focus.

11. Three directions given to rays of light emerging from a convex spherical lens, *i. e.*, parallel, diverging and converging, or—Parallel emerging rays when proceeding from the principal focus; diverging emerging rays when proceeding from a point before the principal focus; converging emerging rays when proceeding from a point behind the principal focus.

12. Three positions for the foci of all rays of light entering the normal refractive media of the eye, making three possible positions for the retina—Entering parallel rays are focused at the principal focus of the refractive media of the eye or on an emmetropic retina; entering converging rays are focused before the principal focus of the refractive media of the eye, or on a hyperopic retina; entering diverging rays are focused behind the principal focus of the refractive media of the eye, or on a myopic retina.

13. Three directions given to light emerging from the normal refractive media of the eye—Parallel emerging rays when proceeding from the emmetropic retina; diverging emerging rays when proceeding from the hyperopic retina; converging emerging rays when proceeding from the myopic retina.

14. Three varieties of meridional or curvature refraction of the refractive media of the eye—Every meridian or curvature may refract alike; the two principal meridians (any two meridians at right angles to each other) may refract unequally, regular astigmatism; different parts of the same meridian may refract unequally, irregular astigmatism.

15. Three conditions of the eye refract alike in every meridian or curvature—Emmetropia; hypermetropia; myopia.

16. Three varieties of regular astigmatism—One meridian may be emmetropic, the other hyperopic or myopic, simple astigmatism; both meridians may be hyperopic, one more so than the other, or both myopic, one more so than the other, compound astigmatism; one meridian may be hyperopic and the other myopic, mixed astigmatism.

17. Three varieties of irregular astigmatism—When the meridians of greatest and least curvature or refraction are not at right angles to each other; when the cornea is conical; when different parts of the same meridian refract unequally.

18. Three refractive abnormalities—Axial myopia or hyperopia—antero-posterior diameter too long or too short; curvature myopia or hyperopia—curvature too great or too little; index myopia or hyperopia—refracting power of media too great or too feeble.

ORIGINAL INVESTIGATIONS ON THE NATURAL HISTORY, (SYMPTOMS AND PATHOLOGY) OF YELLOW FEVER. 1854-1894.

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(Continued from page 633.)

CHAPTER X.

BLACK VOMIT OF YELLOW FEVER.

The following observations on the black vomit of yellow fever, are the results of labors begun in 1856,