

class of cases, Dr. Gant remarks, that the physician is inclined to overdrug the patient and disregard entirely more rational methods which may be less satisfactory in the beginning, but which eventually effect a permanent cure. Dr. Gant has himself discarded for many years the use of drugs for the relief of constipation, and declares that he has treated by other methods several hundreds of patients suffering with this affection, in the majority of whom he has obtained a permanent cure, while the remainder have for the most part been to a greater or less extent relieved. The principal features of his non-medicinal treatment are the proper education of the patient, together with the administration of enemata when necessary, massage, the application of electricity, divulsion or division of the sphincter muscle, and division of the rectal valves—any one or all of these procedures being carried out as the case demands, the patient being warned that it may be several weeks before the desired results are obtained.

With regard to the proper education of the patient, Dr. Gant insists upon the necessity of temperance in manner of living, and regularity of habits. Meals should be taken at regular hours, and should be moderate in amount and eaten slowly. Fruits should be included in the dietary and should be eaten preferably in the morning or just before retiring. Water should be drunk freely throughout the day, and there are few more reliable laxatives than two or three glasses of cold or warm water taken in the morning on an empty stomach. Plenty of systematic exercise should be taken, in the open air if possible. A cold bath each morning is a useful adjunct. Dr. Gant points out that the administration of enemata daily to evacuate the bowel is a most pernicious practice and should be condemned. Early in the treatment of constipation enemata may be necessary, but their use should be discontinued as soon as other methods have become effective.

Massage is an essential feature of the non-medicinal treatment of chronic constipation. If possible a masseur should be employed as the patient cannot carry out the necessary manipulations himself without causing the abdominal muscles to contract. Massage should be commenced in the right iliac region, and should follow the course of the large intestine. This process should be gone through every other day at first, while later on twice a week will suffice. If the patient be unable to employ a masseur he may receive much benefit from daily rolling a cloth-covered metal or bowling ball over the course of the colon while lying in the recumbent position. Divulsion of the sphincter muscle is necessary when the muscle has become hypertrophied or irritable. Gradual divulsion may be accomplished without an anæsthetic by means of the passage of graduated bougies. Rapid divulsion is carried out with general anæsthesia, the muscle being stretched with the thumbs until its resistance has been overcome.

To perform the operation of valvotomy, Dr. Gant has devised a special clamp which can be fixed to the enlarged valve and left until it becomes separated by pressure necrosis. The clamp usually comes away in from four to six days. The advantages claimed for this method are its painlessness and freedom from hæmorrhage and other complications.

In concluding, Dr. Gant states that in his expe-

rience the results obtained from the non-medicinal treatment of chronic constipation are by far more satisfactory and permanent than those following the use of drugs.

<sup>1</sup> Medical Record, October 24.

### THE PHYSICAL FACTORS IN PHOTOTHERAPY.

SOME interesting experiments have been carried out by J. E. Barnard and H. de R. Morgan<sup>1</sup> with the object of ascertaining to what agencies may be attributed any therapeutic effects that the light treatment may produce. The first question that requires solution is whether the effect of the light treatment on any specific disease, such as lupus, is due to bactericidal power of the light or to the reaction which it excites in the tissues themselves. This question they have as yet been unable to decide. Although it is well known that light, without heat, destroys micro-organisms outside the body, it may be doubted if a similar result will be produced on bacteria lying in the tissues of the body. They point out that light is powerless to destroy bacteria in those cases where its rays are made to pass through any organic substance before impinging on the bacteria, even the thinnest film of agar, for instance, serving as a protection. Much less can the bactericidal rays penetrate living or dead tissue under the ordinary conditions of experiment. This was proved by the following experiment. The light from an arc lamp was allowed to fall on part of the surface of an agar plate which had been thickly inoculated with an active culture of bacillus coli communis. In order to exclude heat the rays from the arc lamp were made to pass through a cylinder through which water was kept circulating. Even after so short an exposure as eleven seconds the comparative number of surface colonies was greatly reduced in that part of the plate which had been exposed to the light, but those in the unexposed portion of the plate and those colonies in the depth of the agar were unaffected, even after two hours' exposure. A somewhat similar experiment showed that a portion of human skin was as efficient a protector of the colonies as was a film of agar, and the same was true both of a living and a dead frog's foot. A very pretty illustration is shown of an agar plate subjected to the latter experiment, in which the surface bacilli have been destroyed around the frog's foot, while those which lay under the foot and so were protected from the light have grown, and the shape of the foot is clearly marked out by the growth. From these experiments it is concluded that, the bactericidal rays being non-penetrative, the therapeutic effects of light may be due to the reaction produced in the tissues. They then proceeded to try and differentiate the bactericidal rays from those which excite a reaction in the living tissues. Although the bactericidal rays could be exactly localised in the spectrum, those which are capable of setting up a tissue reaction could not be so definitely located. The bactericidal rays were found to occupy the middle third of the ultra-violet portion of the spectrum, and were localised by exposing culture plates to the spectrum of an arc lamp. The portions of the culture plate on which the visible spectrum fell were unaffected, and the same was true for a short space beyond the visible violet

of the spectrum, then there came an area corresponding to the middle third of the ultra-violet portion of the spectrum where growth was prevented. Although the rays causing tissue reaction could not be exactly located in the spectrum, it was shown that they belonged to the ultra-violet portion by the fact that they would not pass through glass. An important fact was discovered concerning the bactericidal rays, namely, that the interposition of water considerably diminished their power of destroying micro-organisms. Thus it was found that an ex-

posure of five minutes without the water-circulating apparatus had a greater germicidal effect than a 25-minute exposure with it. In other words, the light on passing through 2.5 cm. of water lost four-fifths of its bactericidal power. They therefore conclude that in photo-therapeutics the generally-used water-cooling apparatus might be dispensed with if the heat could be eliminated by other means, assuming that the directly bactericidal rays are the essential ones, which at present is by no means certain.

<sup>1</sup> British Medical Journal, November 14.

## PROGRESS IN DISEASE OF DIGESTIVE ORGANS.

**Mastication.**—The importance of efficient mastication is insisted upon by Campbell<sup>1</sup> both as an integral part of digestion and as an aid to the proper development of the jaws, teeth, and nasopharynx. Its first function consists in finely dividing the food so that it is easily acted upon by the gastric juices, and so called indigestible foods are well borne by many dyspeptics if thoroughly masticated. It also reflexly promotes the flow of saliva and thus stimulates the stomach. Its effect on development is hardly less important; the blood supply and nutrition of the parts are improved, and hence narrow jaws, dental caries, pyorrhœa alveolaris, and adenoid vegetations are avoided. The present age is one of soft foods, which decrease the necessity for mastication and are thus responsible for many modern ailments—appendicitis and adenoids being among the most prominent.

**Gastric Ulcer.**—Half the cases of gastric ulcer are cured by medical means, and 1 per cent. of all gastric cancers originate in ulcer (Cordier<sup>2</sup>). The medical treatment is physiological rest. Rectal feeding for a week to a fortnight with not even water by the mouth is advocated by Rolleston, Collier, Boyd, Griffiths, Dawson<sup>3</sup>; King would allow water, and Saundby considers that only in case of hæmatemesis should food be withheld, and then only for 48 hours. Collier, Boyd, and Dawson consider the actual nutritional value of enemata very slight. Washing out of the rectum daily (Rolleston) or every third day (Griffiths) should be ordered. Bleeding and perforation are the indications for operation, but bleeding often comes from multiple points or minute openings (McPhedran, Dawson), and if alarming is a contraindication for operation (Cordier). Adrenalin is recommended by Rolleston, though King has employed it without effect, and Dawson considers it and ergot dangerous; but Rolleston agrees with Parker in advising calcium chloride. The operation of gastroenterostomy is advocated by Cordier, though Boyd considers it useless. Operative interference is only justified by persistent pain, recurrent hæmorrhages, and obstruction. The pain may be due to adhesions (McPhedran). Rodgers<sup>4</sup> has tabulated six cases of gastric and duodenal ulcer to show the uselessness of the obliteration of liver dulness as a sign of perforation. It appears, however, to bear some relation to the contents of the stomach. The dulness is least marked during rectal feeding, and more marked after a meal than before it. The occurrence of vomiting of a reflex nature during rectal feeding has been demonstrated by Rolleston and Jex Blake<sup>5</sup> by an analysis of 171 cases of gastric ulcer at St. George's. Twenty-

seven per cent. of all cases so fed vomit, but in the rather larger proportion this is due to oral sepsis.

**Hyperchlorhydria.**—This condition, which is associated with many diseases, such as mucous colitis (Bottentuit) and some cases of gastric ulcer (Rolleston), is not uncommon in carcinoma, but, according to Gwyn,<sup>6</sup> extreme degrees in this disease are rare. He quotes a case in which the total acidity was 70, and free hydrochloric acid up to 55 was found four months after onset. Later on it diminished and attacks of stupor of obscure origin supervened. Meunier<sup>7</sup> considers that hyperchlorhydria should only be diagnosed when, after Ewald's diet, the gastric juice contains saccharine matter of reducing power less than 1 per cent. dextrose, or soluble starch derivatives yielding less than 2 per cent. dextrose. A method of estimating clinically the amount of HCl. in gastric contents has been devised by Ham and Macleod.<sup>8</sup> It only requires an ordinary polarimeter and gives practically the same results as Hoffmann's, on which it is based. Dextrorotatory solutions of approximately the same strength are used, and all are "incubated" for exactly the same time. In one is a known amount of acid, in the other the gastric juice to be tested, together with grape sugar. The amount of acid in the unknown solution will be obtained by multiplying the number of degrees of inversion it produces by the amount of acid in the known solution and dividing the product by the degrees of inversion produced by the latter.

**Gastric Tetany** has been described as a rare and almost necessarily fatal condition, but Moynihan,<sup>9</sup> who has recently described a severe case thinks that slight attacks are not uncommon, but that they are unnoticed till they culminate in a perhaps fatal manner. It is thus a preventable condition if taken early and the treatment is gastro-enterostomy.

**Hiccough** is certainly another condition frequently seen in its slighter phases; a bad case has been described by Atlee.<sup>10</sup> It occurred in an old man who after three days of intermittent attacks hiccoughed continuously for four days. A calomel purge, counter irritation to the epigastrium and a mixture of bismuth and aromatics quieted the spasms, but they soon returned and were finally overcome by frequent doses of chloral. None of the ordinary causes—reflex or mechanical irritation, central disease, or toxic absorption could be proved to have operated in this case.

<sup>1</sup> Lancet, 1903, ii., pp. 84, 150, 216, 375. <sup>2</sup> Med. Rec., 1903, i., p. 755. <sup>3</sup> Ibid., ii., p. 271. <sup>4</sup> Lancet, 1903, ii., p. 98. <sup>5</sup> Brit. Med. Jour., 1903, ii., p. 68. <sup>6</sup> Med. Rec., 1903, i., p. 817. <sup>7</sup> Ibid., ii., p. 268. <sup>8</sup> Lancet, 1903, ii., p. 313. <sup>9</sup> Bact., March, 1903. <sup>10</sup> Amer. Jour. Med. Sci., July, 1903.

(To be continued.)