A NOTE ON THE BENEFICIAL EFFECT OF THE INGESTION OF CANE SUGAR IN CERTAIN FORMS OF HEART DISEASE.

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THE idea of using sugar for this purpose is somewhat startling, until one has thought over the physiology of sugar for a moment; I shall therefore briefly run through the changes undergone by cane sugar from its ingestion to its storage and use in heart muscle.

That glycogen is essential to healthy, well-nourished muscle is shown by the fact that it furnishes a source of energy for the needs of the tissue cells, and particularly for muscular work. The glycogen of a muscle disappears in proportion to the work done by the muscle, and, indeed, prolonged muscular work, especially in starvation, may wipe out quickly the entire store of glycogen in the body—in the liver as well as in the muscles.

All modern physiologists agree that the glycogen stored up in a muscle is converted into dextrose by an amylolytic ferment before being actually used for producing muscular energy. Such a ferment has been discovered by Nasse. In cane sugar, therefore, we have a simple means for supplying the muscles with dextrose for the purposes of their activity.

All the foregoing is, of course, well-known straight-forward physiology, but what is not so generally known, apparently, is that dextrose is capable of nourishing the heart muscle in a most wonderful and peculiar manner. F. S. Locke (King's College, London) has kept the excised mammalian heart beating for ninety-one hours after the death of the animal from which the heart was taken. Perfusion with solution of dextrose was carried out daily for five days, and at the end of that time the heart was beating so regularly that it was used by Professor Halliburton to demonstrate to a class of students. Again F. S. Locke says: "Experiments have been made with galactose, rhamnose, l-arabinose, and glucoheptose. No action at all comparable to that of dextrose could be found."

I have said enough to show the beneficial effect of dextrose on mammalian heart muscle, and in my hands the good effect of taking cane sugar to improve the nutrition of the musculature of the heart has been quite in accordance with what was to be expected from what is known of the physiology of the subject.

I will now very briefly give a few cases illustrating the clinical value of this mode of treatment of certain forms of heart trouble. I should mention that I have always used Glebe granulated cane sugar, which is, I am told, one of the purest cane sugars on the market.

Definition.—I take the physical signs of dilatation given by Broadbent in his work on the heart. The pulse is irregular in rhythm and unequal in force of beat; usually easily compressed. On deep percussion the heart is more rounded in the apex region than normal, and the area of dullness is greatly extended to the left. The first sound is short and sharp, and it is almost always audible in the aortic area.

Dilated Heart of Advanced Age.

Lady, 74 years of age. Dilated heart, with systolic murmur. Treated with drugs with little benefit. She was so ill that she had to be kept in bed in the recumbent position. She was put on cane sugar, and in the course of three months was able to go out walking. She has been quite well ever since, but she takes the sugar from time to time when she feels she requires it. This lady could not stand without feeling faint, but for the last four or five years she has been able to travel alone visiting her friends. She is now in her 81st year, and is quite well and walks out alone daily.

Gentleman, 77 years of age. In the habit of taking alcohol freely. His heart dilated and he was losing flesh. All alcohol was stopped and he was put on the sugar. In three months he was much improved. For the last two years he has enjoyed wonderfully good health. He is rather proud of his achievements in the walking way. Since beginning the sugar treatment he has had an attack of acute bronchitis and one of severe diarrhoea, but he got over both attacks in a wonderful way, and he is now at 80 years of age in excellent health, both mentally and physically.

Valvular Heart Disease.

Woman, 34 years of age. Admitted to hospital August 18th, 1910. August 27th, 1910, the note is: "There are very audible systolic and diastolic murmurs at the aortic base." She was treated for three months without benefit, and on December 1st, 1910, she was put on the sugar. She has now (January 20th, 1911) complete compensation, and her pulse is quite regular and of good tension, and she is assisting in the ward work.

Woman, 27 years of age. Admitted to hospital October 27th, 1910. On November 4th, 1910, "the apex beat is 1 inch outside the nipple line. Systolic murmur heard all over the chest, and a pre-systolic murmur at apex." The pulse is hardly perceptible, and her feet, legs, arms, and cheeks are blue (livid). Heart acting extremely feebly. On December 1st she was put on the sugar. On January 5th, 1911, she was up and helping in the ward work. She left the hospital January 20th, 1911.

For the two previous hospital cases I am indebted to the kindness of Dr. H. Davy, who, on December 1st, 1910, allowed me to select these cases as suitable for the treatment.

Post-influenzal Dilatation of Heart.

Gentleman, 60 years of age. In September, 1913, he had a sharp attack of influenza, after which his heart dilated with the usual symptoms. He was put on the sugar and improved rapidly, and has been well ever since.

Heart Strain.

Young man, 21 years of age. For some months has been riding all over Devonshire and Cornwall on a bicycle, carrying a heavy load of books on his back. He now complained of feeling weak, and unable to do his work. His heart was dilated. I ordered rest, and put him on the sugar. This was two years ago. He is now quite well, and there are no signs of his former trouble. I should mention that he suffered from pyorrhoea alveolaris, and it is possible this had something to do with the dilatation as a contributory cause.

Heart Failure in Tuberculous Phthisis.

Woman, 35 years of age. Strong family history of tubercle, from which her father, mother, and brother had died. Eighteen months ago she was extremely thin, and had decided symptoms of tuberculous phthisis. The right apex was consolidated, and there was slight expectoration, and she was losing flesh rapidly, and was confined to her bed. I put her on the sugar and Easton's syrup. In the course of six months she improved sufficiently for her to go out of doors for a short walk. Now (January 25th, 1911), she can run and do anything in the way of exercise as other people, and she is getting rid of the slatey appearance of her skin, and has a healthy colour. She has put on flesh and retains it. She still takes the sugar, but not in so large quantities. Her heart symptoms have almost disappeared—that is to say, the dull area is only slightly increased to the left, and the apex beat is nearly in the normal position.

I have had good results also in anaemic cases with dilated hearts and also in a case of chloroform heart.

In all these cases I have rarely found any sugar in the urine although so much sugar was taken; but occasionally there was a trace.

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MECHANO-THERAPEUTICS IN THE TREATMENT OF CHRONIC CONSTIPATION.

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I HAVE followed with great interest the recent discussion on chronic constipation and its treatment, opened by Dr. J. F. Goodhart at the last meeting of the British Medical Association, which was reported in the *BRITISH MEDICAL JOURNAL* for October 8th, 1910. I could not but be struck by the scanty references which the various speakers at the meeting made to the value of mechano-therapy in alleviating the condition referred to.

The movement cure in its modern phase dates back to the commencement of the last century, when it was invented by the Swede, P. H. Ling (1776-1839). After his death his pupils developed the work which he had begun, the chief ones being L. G. Branting, H. Ling, and H. Kellgren. Ling's Swedish treatment, at first entirely empirical, has in the course of a century undergone a development which grounds it firmly on a rational basis of physiology, anatomy, and pathology.

On considering the pathology of constipation from the mechano-therapeutic point of view, the following three features are apparent:

1. *Diminution in the Expulsive Power of the Intestine.*

This is generally a secondary state due to the second feature.

2. *Diminution in the Function of the Abdominal Sympathetic.*

The integrity of the sympathetic mechanism is dependent upon a normal amount of sensory conductivity in the sympathetic and a normal amount of discharge of motor impulse to the viscera. Diminution if sufficient in amount in either of these will, in the course of time, lead to defective innervation.

To test the functionality of the abdominal sympathetic, ordinary deep palpation is useful, noting the amount of tenderness. Instead of this, however, a friction with the finger tips across the portion of the abdominal sympathetic that is being palpated is an equally good if not a better guide. Frictions across the ganglion impar—that is, across the anterior surface of the coccyx—can also be used to test its condition. The friction will normally call forth certain definite sensations which may be rather acute. In abnormal cases, however, these may vary in amount from great hyperaesthesia to practically complete anaesthesia. With chronic constipation the tendency is nearly always towards diminished sensation, though this is more marked in the lower part of the abdominal sympathetic, and not so much in the case of the solar plexus and semilunar ganglion; in cases of rectal atony the ganglion impar is commonly found to have very little sensation, sometimes, indeed, none. The amount of sensation elicited by the above method is an excellent index to the state of functionality of the abdominal sympathetic.

3. *Diminution in the Power and Tone of the Muscles of the Abdominal Wall.*

(a) *The Muscles of the Anterior Abdominal Wall.*—It is extremely common to find these weakened in chronic constipation; the result is that there is a tendency to negative pressure in the abdomen and the intestinal contents suffer. Peristalsis is reduced, the intestine can more easily over-dilate and less readily contract, enteroptosis will ensue with greater facility, the abdominal circulation will not be so good, stasis and varicosity will ensue. The act of defaecation will be rendered more difficult.

(b) *The Diaphragm.*—There is frequently coincident weakness in the diaphragm. Downward displacement of the diaphragm is a frequent if not invariable accompaniment of enteroptosis (Keith).¹ Furthermore, diminished action of the diaphragm will not bring about the continual changes in the shape of the liver, stomach, etc., which are so necessary to the fulfilment of their functions, and to the maintenance of the circulation within them (Hasse,² Walz,³ Moebius⁴).

As regards the Swedish manual treatment referred to earlier in this article, the following exercises and manipulations are those best adapted to combat the foregoing pathological conditions.

1. *Active Movements (Purely Active or Resisted) bringing into Play the Muscles of the Abdominal Wall.*

A great number of these exist, but I shall content myself by merely referring the reader to the numerous articles and books that deal with the subject, only remarking that a suitable selection of movements must be made for each individual case.

2. *Respiratory Exercises.*

During Swedish manual treatment all active exercises should be executed (as already mentioned) with full regard to deep and free respiration on the patient's part, so that all such exercises are also respiratory exercises. There are, however, many exercises, both active and passive, which are solely used for the purpose of improving the respiratory mechanism. Again I would refer the reader to the extensive literature that deals with this particular class of movement.

3. *Passive Manipulations of the Abdominal Viscera.*

I shall confine myself to describing those most commonly employed.

(a) *Deep pétrissage of the abdomen* is given so that the abdominal contents receive a thorough kneading, the direction of the manipulation being, generally speaking, in the line of the large intestine, commencing at the ascending colon and ending at the sigmoid flexure.

(b) *Special Manipulations for the Liver.*—The lower border of the liver may be submitted to *pétrissage* or strong vibrations, either stationary or running along the costal margin. Frictions in a zigzag direction can also be applied here, and even tapotement of the liver. The amount of sensation induced is a good guide to the duration and intensity of the manipulation.

The effect on the abdominal contents of the above manipulations on the intestine is due to two main factors: (a) Alternate compression and relaxation, and (b) mechanical stimulation, chiefly direct, but partly reflex. The individual phenomena are as follows:

(a) Promotion of the venous flow in the portal system and the inferior vena cava (that is, unloading of the abdominal veins) and vaso-dilatation of the splanchnic area (that is, improved arterial supply).

(b) Stimulation of the intestinal peristalsis. In cases of largely dilated colon this is often quite visible to the naked eye; and quite recently it has been studied by some observers by means of the administration of bismuth and then the use of the x rays.

(c) Onward progression of scybalous masses—that is, unloading of the contents of the atonic intestine. This is frequently apparent during the actual application of the abdominal *pétrissage*.

(d) Improvement in the secretion of the pancreas, intestine, and liver.

(e) Increased absorption by the lacteals.

(f) Stimulation of the stomach proper, which tends to react favourably on the intestinal peristalsis.

(g) Stimulation to a certain extent of the abdominal sympathetic (see under next section).

(h) Stimulation of the abdominal parietes (see under active exercises).

(i) Various reflex effects on the heart, cerebro-spinal system, etc., which it is unnecessary to consider here.

4. *Passive Stimulation of the Abdominal Sympathetic.*

There are three ways of effecting this by means of "nerve frictions":

Reflexly. (a) Through the external branches of the posterior divisions of the spinal nerves.

(b) Through the anterior divisions of these nerves.

Directly. (c) Through the abdominal wall, as already stated.

A friction on a cerebro-spinal nerve is administered by drawing the fingers across it as nearly as possible at right angles to its long axis. Frictions on the external branches of the posterior divisions of the spinal nerves, or along the course or across the anterior cutaneous branches of the lower six intercostal nerves, can be employed in order to stimulate the muscle of the abdominal wall directly and the abdominal viscera reflexly. Friction on the abdominal sympathetic direct can be applied in the manner described on any portion of the sympathetic that may be needed; with topographical anatomy as a guide, it is possible to reach the solar plexus, semilunar ganglia, and inferior hypogastric plexus.*

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- ¹ *Lancet*, 1903, p. 631. ² *Arch. f. Anat. (u. Phys.)*, 1886, 185-210; and *ibidem*, 1903, pt. 1, 23-26. ³ *Muench. med. Woch.*, 1902, xlix, 785-787. ⁴ *Muench. med. Woch.*, 1899, xlii, 313-315.

* Further details on the manual treatment of the abdominal sympathetic can be found in the *New York Medical Journal*, 1910, pp. 171-175, and in the *Arch. gén. de théér. phys.* for November, 1910.

THE twenty-first Congress of French-speaking Psychiatrists and Neurologists will be held this year at Amiens (August 1st to 6th) under the presidency of Dr. Deny, physician to the Salpêtrière. The following are the questions proposed for discussion: *Psychiatry*: Different kinds of psychopathic pains; their significance and the part played by them. *Neurology*: Tumours of the pituitary body. *Legal Medicine*: The value of the testimony given by lunatics in courts of law. A number of original communications on subjects connected with psychiatry, neurology, medical jurisprudence, and the care of lunatics, will be made.