

place; after which, if sufficient, rapid relief occurs, the oppression is removed, the breathing becomes easy, the palpitation disappears, and the other symptoms subside. The above description applies to cases which are mainly gastric. When the flatulence is intestinal, great tightness of the abdomen is experienced, it is distended and tight as a drum, pain is felt usually in the left hypochondrium, and loud rumbling noises are heard in the bowels. If downward escape of gas occurs, the relief may be rapid, otherwise the discomfort may continue for hours.

What is the explanation of flatulence? What causes the distension of the stomach and bowels? Various theories have been advanced to explain the phenomena:

(1) *Swallowed air*.—A certain amount of air is swallowed by all persons in the processes of mastication and deglutition, the air being incorporated with the bolus of food; but there is no reason to believe that more air is swallowed by sufferers from flatulence than by healthy persons. It is a physiological process.

(2) *Fermentation*.—It is thought to be due to fermentation processes occurring in the food in the stomach. This is a view very commonly held, and which apparently receives some support from the effects of antizymotic drugs in the treatment of flatulence. The subject, however, is one of much complexity and difficulty. The remedies most used, such as creosote and carbolic acid, are weak antizymotics, and are given in such small doses that it is scarcely credible their action is so simple as to arrest fermentation and decomposition. Dr. Maguire has made some very sensible and valuable remarks on this subject, showing that, in quantities in which these remedies are used in treating disorders of the stomach, they must be practically inert as antiseptics, though he fully admits their efficacy. Moreover, Sir William Roberts has pointed out that fermentative processes are too slow to account for the rapid development of flatulence in dyspepsia; and he believes that fermentative processes, whether toruloid or bacterial, can only take place when food is retained in the stomach for a very long time; twenty-four or forty-eight hours, or longer. We must therefore dismiss fermentation of the contents of the stomach as the source of the gas in the stomach in cases of ordinary flatulence.

(3) *The evolution of carbonic acid gas in the stomach* due to the action of residual acid mucus in the alkaline saliva swallowed with the food. This, as pointed out by Sir William Roberts, is a possible cause of flatulence in acid dyspepsia. In many cases of flatulence, however, there is no evidence of acidity, and it will not, therefore, account for all cases.

(4) *Regurgitation of carbonic acid from the duodenum*.—This, again, is a possible source of the

gas that distends the stomach; but it can occur, probably, only when the gastric juice is hyperacid, or otherwise it would be of much more common occurrence in the healthy.

(5) *Want of gastric tonicity*.—Most of the sufferers from flatulence are the subjects of atonic dyspepsia, in whom there is no evidence of excess in quantity or altered character of the gastric juice, but in whom the muscularity of the stomach, often in association with a general flabbiness of the whole muscular system, is at fault. Thus it happens that when food is taken into the stomach this organ, instead of bracing itself to its work of muscular activity, so as to move its contents about by vigorous peristaltic contractions, *relaxes*, and the gas always present in the stomach, without undergoing any augmentation in *quantity*, undergoes an augmentation in *volume*, occupies a greater space, distends the viscus, impedes the descent of the diaphragm, causing an impediment to breathing, pushes up the heart, causing palpitation, and by a reflex process, gives rise to the other symptoms which are so frequently associated with flatulence.

The proofs that tonicity of the stomach is at fault are numerous. The great majority of sufferers from this complaint present, if sought for, evidence of nervous exhaustion or nervous instability produced by a multitude of causes. This view that flatulence in general is caused by a want of tone of the stomach, is also confirmed by the effects of treatment. In most cases relief is obtained, not by dieting, which, apart from correcting gross errors of management, is of little avail; not by correcting acidity, which is frequently absent; but by measures which, by improving the general health, increases the nervous vigor of the body and the tonicity of the gastric muscularis.

That nervous influences are capable alone of bringing about flatulence there is abundant evidence to show. All are familiar with hysterical flatulence—how suddenly it appears, quite independently of food. Again, it has fallen to the lot of many to witness the sudden and intense flatulence, gastric and intestinal, which occasionally supervenes on some severe nervous shock. Or, again, many have witnessed the intense tympanites which occasionally occurs in the moribund when the *vis nervosa* is exhausted. One of the most striking instances of this sudden distension of the stomach by gas I have known occurred in the person of a late and, at one time, very popular poet. His account of his sufferings was very instructive. He told me that when he commenced walking he could feel his stomach swelling, his breathing became difficult, and the oppression was so great he was compelled to stand still. He would remain for some minutes, often in front of a house, and told me he was sometimes afraid of being arrested