digestive process by causing the supply of arterial blood to the stomach to be increased. But no changes of the blood pressure have been observed after the administration of bitter tonics until a notable improvement of the general nutrition of the body has resulted. It seems probable, however, that the action of quinine and strychnine upon the digestive organs is in part due to an improvement of the general circulation.

The bitter tonics display their therapeutic power most markedly in atonic dyspepsia, that is, in cases of dyspepsia in which the slow and imperfect digestion results solely from weakness of the stomach. In such cases the appetite is feeble, and the tongue clean or only thinly coated, and generally pale and flabby. Unless only very digestible food be eaten, in moderate quantities, the meals are soon followed by a feeling of weight in the epigastrium, and often by fulness and eructations which sometimes have a rancid taste. But decided pain in the region of the stomach, and thirst, fever, and vomiting are absent.

The bitter tonics are also employed in dyspepsia due to chronic catarrh of the stomach; generally small doses, in slight or mild cases, soon cause a notable abatement of the symptoms; but they generally aggravate severe catarrh, and are decidedly injurious in ulcerative affections of the stomach. They should therefore not be used when there are present severe pain and tenderness of the epigastrium, a heavily coated tongue, and vomiting of blood or large quantities of mucus.

As the bitter tonics improve general nutrition and strength solely by their action upon the digestive organs, they are useless in all forms of general or local debility which are not attended by enfeebled or disordered digestion.

As a rule, the bitter tonics should be given a short time before meals, so that a keen appetite may set in as soon as food is taken. Of the official preparations, the tinctures are the most useful in atonic dyspepsia; generally the compound tincture of gentian, the compound tincture of cinchona, the tincture of quassia, and the tincture of calumba are sufficiently active in doses of one-half to one drachm. The tinctura of nux vomica is effective in doses of five to ten drops, and even smaller quantities sometimes in slight catarrh of the stomach.

If no other morbid state is present requiring active remedies, the bitter tinctures may be prescribed undiluted, the patient being told to take each dose in a small quantity of water or sweetened water. Sometimes they are ordered with a small quantity of syrup or with an aromatic water to modify their taste. The following formulæ illustrate the usual modes of prescribing in atonic dyspepsia: ℞ Tinct. cinchon. comp., ʒ iss.; syrupi, ʒ ss. M. Sig.: A teaspoonful in water before meals. ℞ Tinct. gentian. comp., ʒ iss.; syrup. aurantii, ʒ ss. M. Sig.: A teaspoonful in water before meals. ℞ Tinct. quassiæ, ʒ iss.; syrup. zingiberis, ʒ ss. M. Sig.: A teaspoonful before each meal. ℞ Tr. nucis vom., ʒ i.; aq. menth. pip., aq. destill., āā ʒ i. M. Sig.: A teaspoonful before each meal.

Quinine.—In dyspepsia due to weakness of the stomach the salts of quinine seem to act in the same manner as other bitter tonics. But they are more efficient than the latter when dyspepsia is associated with malarial affections, or is consequent upon pulmonary and cardiac diseases. Probably this is due to the fact that, given in moderate tonic doses, they somewhat increase the general blood pressure.

The opinion is prevalent that quinine may sustain the strength of the body under circumstances contraindicating bitter gastric tonics, such as prolonged fevers with a high temperature. Very commonly doses of two or three grains are given three or four times daily, or even more frequently, in typhoid fever, pneumonia, pleuritis, and other similar diseases. Whether this use of quinine is ever beneficial is very doubtful, and there is reason to suppose that in typhoid fever, especially if the quinine be not given in acid solution, it may increase the tendency to hemorrhage and perforation.

As gastric tonics the salts of quinine should be given in small doses, one-half to one grain, or at most two grains, preferably in solution. ℞ Quin. sulph., gr. xvi.; acid. hydrochl. dil., q.s.; tinct. cinchon. comp., syrup. aurantii, āā ʒ i. M. Sig.: A teaspoonful before each meal. ℞ Quininæ hydrochl., gr. xvi.; glycerini, ʒ ss.; aq. menth. pip., ʒ iss. M. Sig.: A teaspoonful before meals.

Strychnine.—The salts of strychnine are frequently employed as gastric tonics, and are very efficient. They are preferred to all other bitter medicines when feeble digestion is associated with diseases of the respiratory organs impairing the breathing process, such as phthisis, chronic bronchitis, and emphysema. Doses of one-thirtieth grain often notably ameliorate both dyspnœa and dyspepsia. In those diseases of the heart which are productive of disorder of the general circulation, and of slow and feeble digestion, strychnine also should be preferred to those bitter tonics which act solely on the digestive organs. In cases of dyspepsia complicated with habitual constipation, small doses of strychnine sometimes restore normal intestinal peristalsis. As a gastric tonic it should be given in solution or in powder. ℞ Strychn. sulph., gr. ss.; acid. hydrochl. dil., ʒ ss.; tinct. gentian. comp., syr. aurantii, āā ʒ i. M. Sig.: A teaspoonful before meals. ℞ Strychn. sulph., gr. ss.; sacch. lactis, ʒ i. M. Div. in partes æquales xvi. Sig.: One powder before each meal.

Alcohol.—As a tonic no substance is more beneficial when properly used, or more detrimental when abused, than alcohol. Taken in small quantities well diluted, as contained in some alcoholic beverages, especially light wines and malt liquors, it is doubtless the most pleasant and active remedy in cases of atonic dyspepsia. It was observed from time immemorial that wine, taken very moderately with meals, enables a weak stomach to digest food more easily and speedily, and increases the general vigor of the body. Hence the advice of St. Paul to Timothy: "Drink no longer water, but use a little wine for thy stomach's sake, and often infirmities."

In experiments it has been found that alcohol, applied in small quantity to the gastric mucous membrane, causes a more copious secretion of gastric juice than any other substance. Doubtless it is this action, a decided increase of the secretion of gastric juice when wine is taken with full meals, which augments the appetite and enables the stomach easily to dispose of the larger quantity of food. Taken in excessive quantity alcohol retards digestion and causes gastric catarrh. This effect always results if large quantities are rapidly imbibed so as to produce decided intoxication. It is frequently observed also in individuals who habitually drink to excess, especially in those who take ardent spirits before meals. Some persons, however, who indulge excessively in beer or light wine, do not exhibit any symptoms of gastric disorder.

In cases of atonic dyspepsia only light wine or malt liquor should be recommended for prolonged use, as the danger of excessive indulgence and hence injury to the stomach is much greater from ardent spirits. If it becomes necessary to use whiskey or other strong alcoholic, the patient should be warned against taking it undiluted before meals.

Alcohol is superior to other gastric tonics not only because it is more agreeable, but because it exerts a more favorable influence on general nutrition. It is now well established that alcohol is nearly completely consumed in the body, and that in undergoing oxidation it yields heat and other force, and thus behaves in the same manner as other non-nitrogenous food. Robust persons with strong digestive organs, who easily dispose of sufficient food to maintain perfect nutrition, do not require alcohol as a nutrient; but those who naturally have a weak stomach and "often infirmities," are decidedly benefited by moderate quantities.

Alcohol displays its greatest utility in diseases so profoundly disordering the digestive organs that little or no ordinary food can be digested. In typhoid fever it is often the means of saving life. As it requires no diges-