

In regard to the first point we find that the action of astringents is, in great part, if not entirely, to be attributed to their chemical agency. In most instances, these bodies have an affinity for certain constituents of the animal solids and fluids, and effect changes by direct combination. Pharmacologists are generally agreed on this matter, and it is thought that, whether applied externally or taken internally, these remedies have a more or less local action, producing astringency or corrugation of the tissues, or coagulation of the fluids. In regard to tannic acid,* Pereira says "Tannin acts on the animal tissues by virtue of its affinity for their constituents. It forms, with albumen and gelatine, compounds which are insoluble in water; and it also combines with fibrin, when taken into the stomach it unites with the constituents of the epithelium, and of the mucous membrane of the alimentary canal." It may therefore be assumed that astringents are, in general, merely chemical agents, and if their anticipated effect is to be realized, their chemical composition must not be modified or disturbed.

In order to determine the chemical action of glycerin on astringents I have commenced a series of experiments, which has, so far, only being completed so as to afford indications of a definite and satisfactory conclusion. The substance chosen as best representing the class of vegetable astringents is gallo-tannic acid—the tannin of commerce; the mineral astringents may be aptly represented by the perchloride and persulphate of iron.

The effect of reagents on an aqueous solution of the *glycerinum acidi tannici* is precisely similar to that produced on a simple aqueous solution of tannin. The salts of iron, tartrate of potash and antimony, chloride of sodium, sulphuric and hydrochloric acids, and gelatin, give, in both cases, colorations and precipitates, alike in appearance. In order to ascertain the comparative power of the two solutions in precipitating gelatin, solutions equal in tannin strength were prepared, and it was found that an equal number of measures of the same solution of gelatin were required for precipitation.

Being unable to detect any difference in the behaviour of these aqueous solutions, a solution of tannin in glycerin, undiluted, was treated with solution of gelatin, and it was found that the tannin was *not precipitated*; or, at least, that only a small portion of the glycerin solution which was in immediate contact with the water con-

* Elements of Materia Medica and Therapeutics, Vol. 1, p. 98.