

former of which were undertaken for the purpose of ascertaining all the constituents, and that of Dulk verified the substantial correctness of the results of the former.

The results obtained by these chemists agree perfectly well with the physiological effects observed by numerous physicians, and which may be summed up with the words of Pereira: "Gentian is very properly regarded as a *pure or simple bitter*; that is, as being bitter, but without possessing either astringency or much aroma." Moreover, none of the works on *Materia Medica*, in the English, French and German languages, which the writer had occasion to consult, mentions tannin or a similar compound in this root.

In the face of these numerous investigations, it must appear rather startling to learn that Mr. E. L. Patch, in a paper recently read before the Massachusetts College of Pharmacy, asserted that "he found tannin in the gentian, contrary to the usual statement of works on *Materia Medica*" ("Drug. Circ.," 1876, p. 48). This assertion seems to be mainly based on "the incompatibility of the tincture of chloride of iron and the compound tincture of gentian," although it is stated that Mr. Patch exhibited numerous preparations of gentian in connection with his paper. Unfortunately, the gentleman seems to have overlooked the fact, that the tincture mentioned contains also orange peel, and that the white parenchyma of the latter is colored of a deep black on the addition of solution of any ferric salt, which coloration, according to Fluckiger and Hanbury ("Pharmacographia," pages 105, 113), is owing, "*probably*, to a kind of tannic matter." It will be observed that the authors mentioned are very guarded in their expression, notwithstanding the ink-black coloration produced by iron salts.

But what is the effect of ferric salts upon gentian? The investigations mentioned above have thrown considerable light on this point. Henry already noticed the dark colour produced by ferric chloride with what he supposed to be the bitter principle, but which was subsequently proven to be merely the yellow coloring principle contained in the root. Baumert says that the concentrated alcoholic solution of pure gentianic (gentisic) acid produces with ferric chloride a red-brown precipitate, and Ludwig found that the aqueous solution of the extract contains a body which, under certain circumstances, imparts a dark-green fluorescence. In these observations we have the key for the behaviour of ferric salts with the preparations of gentian, which I shall endeavour to explain with the following experiments.

Well-dried and bruised gentian root was nearly exhausted by cold water, first by percolation and subsequently by expression after maceration. The first portion of the percolate gelatinized on standing a day or two, in consequence of the separation of pectin compounds. This aqueous infusion is not disturbed by gelatin solution, a pretty sure evidence of the total absence of tannin;