The recorded cases of co-existence of diphtheria and typhoid fever are not numerous. If they were, they would afford some countenance to the view, that the poison of diphtheria is identical with that of typhoid. It is, of course, conceivable that they might be. But so many epidemics of typhoid fever occur without diphtheria, and so many of diphtheria without typhoid, that the evidence at present is strongly against the identity of these essential causes.

CASCARA SAGRADA IN CONSTIPATION.

By R. A. DOUGLAS LITHGOW, LL.D., M.R.C.P.Ed., etc.

NEW remedies succeed each other with such remarkable rapidity now-a-days, that, notwithstanding the ephemeral existence of the majority of them, a fresh series is ever ready to take their place, and "the cry is still, they come." Amid this infinite progression, it is pleasant and instructive to find even one agent that may be regarded as a valuable addition to the medical *armamentarium*; and that such an agent exists in cascara sagrada, time will, I think, inevitably show.

Like many useful remedies, cascara sagrada (a term of Spanish derivation, and signifying "sacred bark") was well known to early writers, and is mentioned by Peter de Crescentius in a botanical work published by him in Bologna in the thirteenth century, in which it is recommended as a remedy for constipation. Its efficacy is also referred to by many Continental authors during the seventeenth and eighteenth centuries. As Dr. Eddmon has pointed out, the term "sacred bark" has been applied to this plant from a very early period. Thus, Pausanias, who flourished during the reigns of Hadrian and the Antonines, in the second century, says: "Æsculapius held the tree sacred; and Bion, who was superstitious, had branches from the rhamnus purshiana fastened over his door;" and Diogenes Laertius, who lived during the reign of Severus or Caracalla, in the third century, observes: "Branches and bark of the rhamnus purshiana were burned as a sacred offering in front of houses when a person died." Verily, "there is no new thing under the sun."

At least three species of the rhamnaceæ are more or less known in medicine; viz., rhamnus catharticus (the common buckthorn), rhamnus frangula (the black alder), and the rhamnus purshiana, now under consideration. The former is such a powerful cathartic as to be now seldom or never used, and the second is still less laxative than the cascara sagrada. It is quite possible, however, that the aperient property which seems common to all the rhamnaceæ may be supplemented in each of the species by such other properties as might result from the action of analogous but not identical chemical constituents.

My attention was first directed to cascara sagrada by an American pamphlet which fell into my hands some years ago, since which time I have prescribed it with almost invariably successful results, and cannot but regard it, under favourable conditions, as a specific in cases of chronic constipation.

Cascara sagrada seems to act as a tonic to the pneumogastric and sympathetic supplies of the *primæ viæ*, aiding the general processes of digestion, whilst, especially promoting those of nutrition and assimilation. At the same time, it so influences the secretory system as to increase deficient, and to improve and restore vitiated secretions, by regulating the action of proximate visceral and intestinal glands. From this it will be seen that its use is especially indicated in cases characterised by torpidity of the liver and an atonic condition of the stomach and bowels.

Where habitual constipation depends upon derangement of the intestinal glands, with consequent defective or perverted biliary and intestinal secretions, associated with an adynamic condition of the muscular and nervous forces of the alimentary canal—involving congestion of the portal circulation, and also of the gastro-intestinal mucous membrane—the action of cascara sagrada will be found most satisfactory, and I have repeatedly known it to succeed in relieving and regulating the bowels when all the other usual remedies had failed. I am glad to find its usefulness is being recognised in British practice, and have little doubt but that increased experience of its therapeutic action will be found to justify the encomiums pronounced upon its value by our professional brethren in America.

As far as my own experience extends, I have seen no reason to withhold its use in any case of habitual constipation of a functional character, even in those occurring amongst children; but it must be admitted that it acts differently in different individuals, some requiring more, and others less; in some, occasionally producing

gripping pains, while in most cases its action is quite painless. Symptoms of tenesmus can, however, be readily obviated, either by limiting the dose or by combining some suitable antispasmodic with the active agent.

In the numerous cases in which chronic constipation is associated with hæmorrhoids, cascara sagrada is of especial service, as its efficient action as an aperient relieves the venous congestion; whilst, instead of irritating, as many cathartics do, it seems to exercise a soothing effect upon the rectal mucous membrane.

With regard to the dose and mode of administration, I need scarcely say that, as in all other cases, the physician should exercise some discretionary power in suiting the remedy to the morbid condition, and in combining it with such other remedies or adjuvants as may seem desirable. My own opinion is that small doses, frequently repeated, will be found more satisfactory than large doses; and this is what we might naturally expect from the physiological action of the drug. When chronic constipation is complicated with flatulent dyspepsia, deficient gastro-intestinal secretion, and impaired muscular tonicity of the bowel, ten to fifteen drops three or four times a day, either before, with, or immediately after meals, will be found to give the most gratifying results. Two to five drops may be given twice or thrice daily to children of a month old. Except in one case, in which an overdose had been taken without medical sanction, I have never known cascara sagrada produce any undue local or systemic disturbance, such as nausea, tormina, impaired appetite, or eructations; and, in fact, I know of no therapeutic agent which is altogether so reliable and satisfactory in the numerous class of cases to which I have alluded.

Ten or fifteen drops should be taken regularly twice or thrice daily for a week, after which time, if no material improvement has been effected, the dose may be increased until the bowels have been freely relieved, when it may be gradually decreased in amount and frequency until healthy intestinal secretions and increased peristaltic action have restored the alimentary canal to its normal condition. Lactopeptin, dilute hydrochloric and nitric acids, tincture of nuxvomica, liquor strychniæ, glycerine, extract of malt, aromatic syrups, etc., may often be advantageously combined with the cascara sagrada, according to circumstances.

The preparation I have been in the habit of using is the fluid extract manufactured by Messrs. Parke, Davis, and Co., and it has invariably given satisfaction.

ON THE CONDITIONS AFFECTING PRECIPITATION OF PHOSPHATE OF LIME FROM URINE BY HEAT.

By WALTER G. SMITH, M.D. Dublin,
King's Professor of Materia Medica; Physician to Sir Patrick Dun's Hospital.

THE fact that clear urines, free from albumen, and neutral or even faintly acid in reaction, frequently yield a precipitate upon heating, is familiar to every one. The explanation commonly given is the expulsion by heat of the free carbonic acid, which is supposed to hold the calcium phosphate in solution. This explanation does not rest upon a sound basis, and is disproved, *inter alia*, by the fact that the precipitate will frequently clear away in part or whole when the urine is thoroughly cooled. This latter curious fact appears to have been unaccountably overlooked until pointed out by E. Salkowski, in a recent number of the *Zeitschrift für Phys. Chemie*, 1883, p. 119. As a rule, no alteration in the reaction of the urine is noticeable after boiling. Salkowski adduces experimental reasons for believing that the phenomenon depends upon the formation of a combination of calcium phosphate ($\text{Ca}_3\text{P}_2\text{O}_8$) and alkaline phosphate, which is easily decomposed by heat; but he does not attempt any precise explanation of the facts.

From some experiments which I have made in conjunction with Dr. Emerson Reynolds, it appears probable that the production of the precipitate depends upon a nice adjustment in the proportions and basicity of the phosphatic salts existing in the urine.

The following equation may express the precipitation which occurs upon applying heat: $2(\text{Ca}_3\text{H}_2\text{P}_2\text{O}_8) + \text{CaH}_4\text{P}_2\text{O}_8 = \text{Ca}_3\text{P}_2\text{O}_8$ (insoluble); + $2(\text{CaH}_4\text{P}_2\text{O}_8)$ (soluble). Upon reduction of the temperature, the inverse change takes place, attended with resolution of the precipitate in part or full, according to the relative amount of acid phosphate present. In short, the phenomenon in question seems to be one of unstable equilibrium among certain phosphatic salts, the balance of solubility being easily disturbed by changes of temperature.

These considerations tend to throw some light upon the deposition