

PHARMACOLOGY OF THE NITRITES AND NITRATES.

Although the first two Croonian Lectures, which dealt with the pharmacology of nitrites and nitrates, contained the results of a large amount of labor and of close experimental research, the third and fourth lectures are, we venture to think, more likely to be of value to busy practitioners, since they deal mainly with therapeutic considerations. Whilst laying due stress upon the various conditions in which the nitrites and nitrates may be of service, Professor Leech does not hesitate to indicate clearly their limitations, even though he thinks that they are too often discarded through excess of caution. In their favor he points to the small quantities necessary to influence the vascular system, to the relative absence of risk, unless employed with suicidal intent, and to the evanescent action. After referring to the broadness of the definition of angina pectoris adopted by Sir Richard Quain, he maintains that according to clinical experience this condition is always associated with a rise in tension, due to temporarily decreased calibre of either systemic or pulmonary vessels, and that the symptoms are the outcome of the heart proving unequal to the work it has to perform. The theory that the relief due to the administration of nitrites is the result of true analgesic action is not supported, the reduction of tension, as originally held by Dr. Lauder Brunton, being maintained as the true explanation. On account of their rapidity of action he prefers the nitrites of the fatty series, which can be employed by inhalation, but he considers that experience has shown that later attacks are of longer duration and that although inhalations are beneficial in earlier attacks they may frequently have to give place to remedies of more prolonged activity, such as nitro-glycerine. Nitrite of amyl, as is well known, is not a stable compound, and it may on that account fail when it is given in solution, although a disappointing result may sometimes be due to the short duration of its period of action or to special insusceptibility of the individual. On the other hand, Professor Leech records many cases in which it has been found expedient to largely exceed the pharmacopœial dose of the liquor trinitrini, and it is noteworthy that in his experience it is far safer to employ somewhat large doses of nitro-glycerine than to resort to injections of morphine. Ethyl nitrate has scarcely been sufficiently employed in angina pectoris to warrant any very definite conclusions, but it appears to exert a more powerful and more persistent influence in reducing tension than that possessed by ethyl nitrite. Although the nitrates of propyl, isobutyl and isoamyl are as effective as the nitrite of ethyl in lowering tension, they cause so much headache

that they have not been employed medicinally. It must not be forgotten that the influence of nitrites and nitrates upon angina pectoris is palliative rather than curative, and that they should therefore be used concurrently with such remedies as iodide of potassium and arsenic.

Paroxysmal cardiac dyspnoea may be relieved by the action of the nitrites on the pulmonary system of vessels as well as on the systemic system, but the ordinary shortness of breath consequent on exertion, which is so frequently met with in simple valvular lesions of the heart, seems to be unaffected by them. On the other hand, Professor Leech is convinced that some good, and no harm, has resulted from the use of nitrites in cardiac failure or in syncope such as that occurring during the administration of chloroform. Of the value of this group in asthma and bronchitis there can be no doubt, but the *rationale* is not easy to explain. It is possible that asthma is not the result of simple bronchial spasm, but that there may also be, as has been suggested by Sir Andrew Clark, some hyperæmia or tumidity of the bronchial mucous membrane, and that the influence on the pulmonary vessels may also relieve the bronchial vessels. Whatever explanation is adopted, testimony is largely in favor of using nitrites in many of those cases which are ordinarily treated with ammonium carbonate and ether. In uræmic dyspnoea and in migraine the results are disappointing, but the converse holds goods for the treatment of forms of headache associated with high tension. The value of the series in tetanus, strychnine poisoning and epilepsy is open to considerable doubt, notwithstanding the favorable statements which have previously been made. In the treatment of acute Bright's disease there is also great lack of certainty of the efficacy of the nitrites, although diuresis has appeared to be hastened by the administration of nitro-glycerine or sodium nitrite; headache and other discomforts have been relieved by them, and they certainly have the advantage of causing no ill-effects. Similar difficulties attend the estimation of the results in cases of large white kidney and in mixed forms of chronic nephritis, but in dyspnoea and cardiac failure of late stages of contracted kidney nitro-glycerine adds to comfort and perhaps tends to prolong life.

Amongst other practical points may be noted the remarks upon the official compounds. On account of the decomposition of nitro-glycerine in presence of any salt it is better to employ the tabellæ or else a simple dilution of the liquor trinitrini with distilled water. For subcutaneous injection, in the rare cases where inhalation of amyl nitrite fails, nitro-glycerine is better than sodium nitrite. The benefits of spiritus ætheris nitrosi has frequently been challenged, even when the spirit has originally contained its proper