tained from the latter, but not from the former. Further differences between the two forms were found on heating (decomposition temperatures), in the reaction with nitrous acid (van Slyke method for amino-nitrogen), and toward bromine.

124 (1302)

On the absorption of apomorphin and morphin through unusual channels.

By DAVID I. MACHT (by invitation).

[*From the Pharmacological Laboratory, Johns Hopkins University and the James Buchanan Brady Urological Institute, Baltimore.*]

The alkaloid apomorphin is well known as a typical centrally acting emetic, producing vomiting by the direct stimulation of the vomiting center. In case of dogs, as is also well known, morphin is found to produce emesis almost equally well. The author has taken advantage of these facts in the study of absorption of drugs through various unusual portals of entry.

On introducing a few milligrams of apomorphin in the form of powder or on instilling a few drops of a solution of 1 per cent. of that drug into the conjunctival sac, vomiting was found to be produced generally in from three to five minutes. Exactly the same phenomenon was observed after the administration of small quantities of morphin. These experiments indicate that the above drugs are easily absorbed through the eye into the general system. That this absorption is in part, at least, due to direct entry into blood and lymph channels and is not a result of an indirect absorption through the nasal ducts, was proven by obstructing the latter canal. This was done in two ways: in some cases the nasal duct was ligated and in the other cases it was occluded by cauterization. Even after obstruction of the nasal duct, apomorphin and morphin were found to produce emesis, though the process required a longer time.

In a similar manner apomorphin and morphin, when introduced into the vagina of dogs, can be shown to promptly induce vomiting, thus demonstrating their absorption through the vaginal wall.

Apomorphin introduced into the nasal canal of the dog, proper care being taken to prevent its reaching the pharynx, was also found to be absorbed and to produce vomiting.

In a similar manner the author has been able to show the absorption of apomorphin and morphin through the urethra, the prepuce and other structures. A comparative study of the absorptive powers of the urethra (in the male) and the bladder, is now in progress.

After having studied the absorption of apomorphin and morphin through the above-mentioned channels, the author has undertaken an extensive investigation concerning the absorption of a large variety of drugs and poisons through the same channels, the results of which investigation will appear in due time.