

ances. The treatment of these two affections naturally varies: in the true causalgia, first described by Weir Mitchell, one has to suppress the conduction of the painful sensations to the conscious nerve centers. To do this, Sicard injects 60 per cent. alcohol into the affected nerve, Girou gets the same result by tying the nerve moderately tightly with number 2 catgut. In the case of the median nerve, this ligature must be applied high up on the nerve above the point at which it receives its sympathetic filaments with its special artery. A morphine injection must be given at the end of the operation, for otherwise there is severe pain for an hour or so after the ligation. In the case of pains due to an irritative lesion of the sympathetic, benefit is obtained by Leriche's periarterial sympathectomy. So also sympathectomy is the treatment for non-painful contractions of sympathetic origin. [Leonard J. Kidd, (London, England).]

**Macht, D. I.** CHEMICAL STRUCTURE OF OPIUM ALKALOIDS AND SMOOTH MUSCLE STRUCTURES. [Proc. Am. Soc. Pharmacol., 1917.]

The author had previously shown that the effects of the opium alkaloids on the ureter, the six principal alkaloids of the opium series can be sharply divided into two classes. The pyridin-phenanthrene group, comprising morphin, codein, thebain and their derivatives increases the contractions of the ureter and raises its tonus; on the other hand the benzyl-isoquinoline group, comprising papaverin, narcotin and narcein inhibits the contractions and markedly lowers the tonus of that organ. A further analysis of the effect of the opium alkaloids on the ureteral contractions and tonicity showed that the stimulating properties of the morphin group on the ureter are to be ascribed to the pyridin grouping of their molecules, and the inhibitory and tonus lowering properties of papaverin and its related alkaloids depend mainly on the presence of the benzyl grouping in their molecules.

From further work on the uterus, urinary bladder, gall bladder, intestines, ureter, vas deferens, bile ducts, bronchioles, and blood vessels (isolated and perfused) it was found that the six principal opium alkaloids, morphin, codein, thebain, papaverin, narcotin, narcein, act in two ways. The pyridin-phenanthrene group comprising morphin, codein and thebain and their substitution products, produce an increase in the tonus and rate of the contractions of the various kinds of smooth muscle structures studied, an effect which seems to be due to the pyridin nucleus of their molecules. On the other hand the benzyl-isoquinoline group comprising papaverin, narcotin and narcein produce inhibition of the contractions and relaxation of the tonus of various smooth muscle structures studied, this effect apparently being due to the benzyl nucleus of their molecules.