24. Relation of the Drugs Acting on the Autonomic Nervous
System to the Effect of Analgesics

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In order to investigate the above mentioned theme, the effect of various drugs in combined use with drugs acting on the autonomic nervous system was studied using a modification of Hardy’s radiant heat technique in man.

The pain threshold elevating effects of (I) Morphine, (II) Dolantin, (III) Ohton (1,1-Dithienyl-3-dimethylamino-butene-1), (IV) L-Ephedrine, (V) dl-Desoxyephedrine, (VI) d-Isolan (3,4-Methylendioxyphenyl-isopropylamine), (VII) Bsnadrin (Diphenhydramine), (VIII) Parpon-M (Dimethylaminoethylbenzylate) and (IX) Avacan-M (Isoamyl ester of a-[N-(ß-Dimethylaminoethyl)]-Aminophenylacetate) were markedly reduced by Priscolin or Regitine (adrenolytics), and also by Prostigmine (cholinergics). On the contrary, they were potentiated by L-Ephedrine or d-Desoxymethylephedrine (adrenergics). For example, Figs. 1 and 2 show the influence of various autonomic drugs to VII and II respectively. (Curves represent average of the

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pyruvic $\leftrightarrow$ oxaloacetic $\leftrightarrow$ malic $\rightarrow$ fumaric

\[ \begin{array}{c}
\text{acetic} \\
\text{citric} \end{array} \leftrightarrow \text{$\alpha$-ketoglutaric} \rightarrow \text{succinic} \rightarrow \text{propionic} \]
second pain threshold for 6 subjects by cross-over test).

Compounds (I)~(IX) were used as hydrochloride. It is well known that II, III, VII, VIII and IX indicate the anticholinergic properties, while IV, V and VI possess the adrenergic effects.

From the above results, it can be readily supposed that the analgesic effect of these drugs has a close connection with their adrenergic (sympathomimetic) as well as anticholinergic (Parasympatholytic) properties.