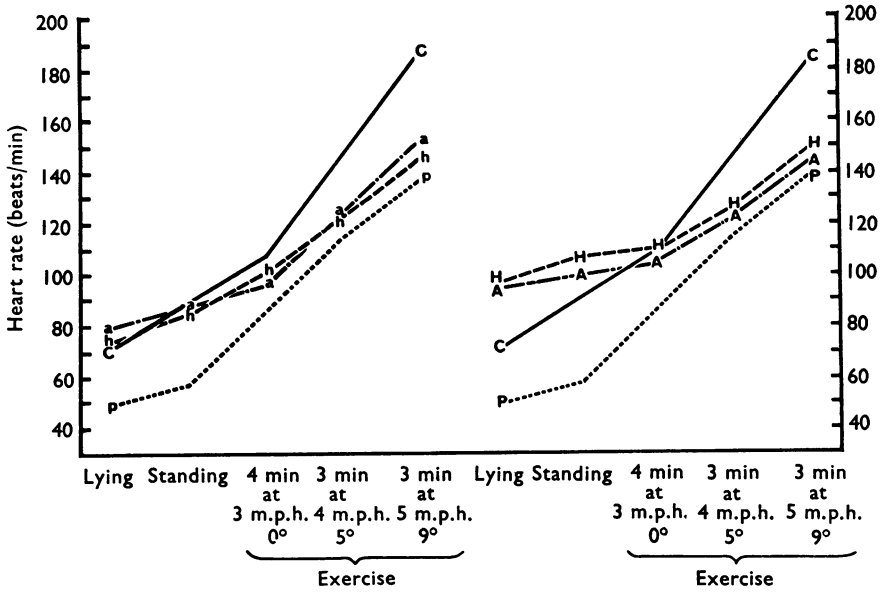

FIG. 1. Mean heart-rates in five volunteers lying, standing and after exercise, without pretreatment (C) and following intravenous administration of propranolol (0·15 mg/kg) alone (P) and with atropine (1·2 mg and 0·04 mg/kg) (*a*, *A*) or (—)-hyoscyamine (0·6 mg and 0·02 mg/kg) (*h*, *H*).

compounds produced a significant fall in heart rate within the first 2 min of injection, but there were no differences between drugs or doses.

The anti-vagal activity of (—)-hyoscyamine is about twice that of atropine on the pharmacologically sympathectomized human heart.

REFERENCES

CHAMBERLAIN, D. A., TURNER, P. & SNEDDON, J. M. (1967). Effects of atropine on heart-rate in healthy man. *Lancet*, **2**, 12–15.

CUSHNY, A. R. (1920). On optical isomers: the tropeines. *J. Pharmac. exp. Ther.*, **15**, 105–127.

A class experiment to investigate the side-effects of anti-emetics

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Opportunity was taken of a practical class in clinical pharmacology to demonstrate and evaluate the side-effects of certain anti-emetic drugs. These are mostly freely available to the public and it seemed worth while to let the students experience their actions because of the high incidence of side-effects, which were on the whole irritating rather than dangerous. Over a 10 year period, four hundred students received some drug (or placebo), and the findings are reported in this demonstration.

The drugs were given intramuscularly on a double-blind basis and included perphenazine (2·5 and 5·0 mg), promethazine (25 mg), propiomazine (20 mg), thiethylperazine (10 mg), cyclizine (25 and 50 mg), hyoscine (0·2 and 0·4 mg), dimenhydrinate (50 mg) and metoclopramide (10 mg). Other students made detailed observations at 10 min intervals for 1 h and the subject noted the effects at 6, 18 and 24 h after injection. Results were later discussed with the whole class.

Contrary to expectations, findings were reasonably consistent in each batch of students and " placebo responses " were infrequent. In the doses given, the cardio-

vascular effects of all the drugs were minimal and postural hypotension did not occur. Drowsiness, lasting for 18–24 h, occurred frequently after all the phenothiazines except thiethylperazine. Although this was present after cyclizine and hyoscine, it came no sooner after administration and was shorter in duration. A few students reported dizziness after the phenothiazines, but this was not nearly as common as with hyoscine. Dryness of the mouth was the most common complication after this latter drug.

The most troublesome sequelae from the point of view of the students were the extrapyramidal effects which occurred after perphenazine and promethazine. Restlessness occurred in half the students, starting 4–5 h after administration and lasting for at least 24 h. It was more marked after perphenazine, and oculogyric crises occurred in two subjects given 5 mg of this phenothiazine.

Of the anti-emetics reported on here, metoclopramide and dimenhydrinate produced the fewest side-effects in students.

A projected study on droperidol (2·5 and 5·0 mg) was abruptly stopped after six administrations because of sedation and Parkinsonian side-effects. The latter had a profound effect on other members of the class who did not realize that " non-toxic " drugs could cause such serious side-effects.

A method for measuring the effectiveness of drugs on platelet thrombus formation *in vivo* (T)

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The release of neurohypophyseal hormones in the dog and their detection using the blood-bathed organ technique (T)

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A method for comparing the sensitivity to chemical stimuli of adrenergic and cholinergic neurones in the cat stellate ganglion (T)

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A rapid morphological change of blood platelets as a pharmacological test system (T)

G. V. R. BORN and F. MICHAL, *M.R.C. Thrombosis Research Group, Department of Pharmacology, Royal College of Surgeons of England, London*

Demonstration of rapid morphological changes of blood platelets (T)

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Autoradiographical studies of aortic endothelium in guinea-pig (T)

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