promazine and chlorprothixene were the same as those which caused ataxia.

A suggestion is offered according to which the ratio of effective doses of a compound in different tests may be indicative of its therapeutic effectiveness. Recently, Freed (1960) reported a clinical investigation of amitriptyline which showed its antidepressant properties in depressed patients.

80 Differentiation of Central Depressants by Means of the Veratramine Excitation. W. SCHOETENSACK and G. HALLMANN (Germany).

Veratramine in small doses evokes tremors, in higher subletal doses convulsive-like excitation phenomena.

Studies in rats and mice have shown the following results: (1) Tremor and convulsions are only suppressed by a few centrally acting muscle relaxants such as mephenesin, zoxazolamine, 2-aminobenzthiazole, chlormezanone and carisoprodol, whereas meprobamate and 2-(γ-methoxypropylaminomethyl)-1:4-benzodioxane-HCl fail to block the veratramine excitation; (2) A number of unsaturated tertiary alcohols, urethane, chloral hydrate and phenylacetylurea abolish the veratramine convulsions but not the tremor.

Hypnotics and anticonvulsants such as phenobarbital, hexobarbital, phenytoin, and troxidone, also a number of tranquillizers, ganglionic blocking-, sympathicolytic-, and anticholinergic agents are ineffective against tremor and convulsions up to the level of lethal doses.

The two excitation phenomena induced by veratramine differ completely in their unusual resistance against most of the investigated drugs from the excitations produced by leptazol, strychnine or by harmine and tremorine.

Transections of brain in rat suggest that structures within the lower brain stem are responsible for initiating the veratramine excitation.

Transections in the higher brain levels including the diencephalon do not change fundamentally the reactions after application of veratramine. After removal of the cerebellum convulsions appear but not tremor.

Decerebrate rigidity in rat is intensified by the central excitants mentioned above, including harmine and tremorine; veratramine, however, completely prevents the hyperactivity of the extensors and after cessation of the veratramine excitation the decerebrate rigidity appears unchanged.

Since the veratramine excitation is completely inhibited only by a limited number of centrally-acting muscle relaxants, these findings seem to be of considerably value for evaluation and differentiation of central muscle relaxants.

The nervous mechanisms probably responsible for the initiation and evidently specific inhibition of the two stages of the veratramine excitation are discussed.

81 Three Types of Artificially Induced Tremors and the Effect of Some Antiparkinsonian Agents upon Them. I. L. BONTA and H. M. GREVEN (Holland).

Usually antiparkinsonian drugs are pharmacologically evaluated by testing them against varying types of tremors produced by surgical methods (tremor-monkey) or chemical means (nicotine, Tremorine). In the course of our investigation of the effect of intracerebral drug injections, we observed that a new compound, Gre-1248, induced a type of hyperkinesia (running fits and hind-limb tremor), which reminded us of certain motor disturbances occurring in extrapyramidal syndromes. The effect of nicotine, Tremorine and Gre-1248 on mice will be demonstrated by a short film.

Antagonistical studies with several antiparkinsonian drugs (atropine, caramiphen, trihexyphenidyl, orphenadrine, diethazine, etc.) have shown that the various compounds induced different degrees of protection against the three types of tremors. The question of parallelism between experimentally-induced tremors and Parkinson's disease or related extrapyramidal disorders will be briefly discussed.

82 A Contribution to the Pharmacology of Tremorine-induced Tremor. P. STERN and J. GAŠPAROVIC (Yugoslavia).

The onset of tremorine-induced tremor (TT) in mice is delayed by application of iproniazid or PIH 20 hr prior to tremorine (T); similarly applied hydralazine or α-methyl DOPA have the opposite effect. Since iproniazid and PIH increase dopamine, serotonin (S) and GABA in the CNS, the three precursors, DOPA, 5-hydroxytryptophan (5-HTP) and glutamic acid were examined. Only 5-HTP delayed TT and harmine-induced tremor, but not that induced by 3-amino-1:1:3-triphenylpropan-1-ol or diethylcysteamine. DOPA and glutamic acid did not act on either kind of tremor. When T was preceded by iproniazid (20 hr) and 5-HTP (2 hr) TT was delayed considerably further than by action of either substance alone. Consequently, an increase of S in the CNS delays TT, although T itself has no influence upon the S-level. The fact that hydralazine and α-methyl DOPA, two inhibitors of amino-acid decarboxylases, are capable of inducing tremor, favours this assumption. S-antagonists, harmine and LSD also induce tremors. Reserpine and chloropromazine-induced Parkinsonism is interpreted on the basis of these facts. In contrast to chloropromazine, reserpine reduces the level of dopamine, the concentration of which is particularly high in the corpus striatum. The latter contains, in addition, much S, substance P and choline acetylase. We have found that S potentiates this enzyme, but so does T alone. It is open to discussion whether accumulation of S in definite regions, e.g. the corpus striatum, can lead to an inhibition of TT. The present results pre-