

144) Operant behavioral observation on visual and auditory effects of drugs. Kohji Takada, Kiyoshi Ando and Tomoji Yanagita. Department of Psychopharmacology, Central Institute for Experimental Animals, Kawasaki 211, Japan.

Rats and rhesus monkeys were trained to press a lever for food reinforcement. Lever pressing during the auditory and visual stimulus periods was punished by electric shock. Complete suppression of the responses in the stimulus period and stable responses in the stimulus-free period were observed. The auditory threshold of rats and the visual threshold of monkeys were determined by the discrete tracking method: the stimulus intensity was decreased or increased by a fixed degree, step by step, according to the suppression rate of the responses in the stimulus period. Quinidine at a dose of 20 mg/kg, i.m. elevated the auditory threshold of rats, while the response suppression in the visual stimulus period and the responding rate in the stimulus-free period were not affected. LSD-25 at doses of 4 and 8 µg/kg, s.c. markedly elevated the visual threshold of one monkey, however, the threshold of another monkey was not affected at 20 µg/kg although the rate of response decreased. Pilocarpine applied to a monkey's eyeball in a dose of 0.02 - 0.16 mg/kg/eye constricted the pupil and elevated the visual threshold. It was concluded that the drugs tested had specific effects on the sensory functions of the animals, and that this method can be of use for assessing the toxic effects of chemical substances on auditory and visual sensations.

145) Social isolation induced behavioral changes under intense stimuli and the biochemical mechanism. Tadashi Nishikawa, Yumiko Kajiura, Yasuko Kohno, Takayasu Sano, Masatoshi Tanaka and Nobuyuki Nagasaki. Department of Pharmacology, Kurume University School of Medicine, Kurume 830, Japan.

It is well known that prolonged isolation of many species of animals, especially rodents, induces aggressive behavior. Valzelli (1973) proposed the term "isolation syndrome" to define more adequately such altered behavior, but little more than the signs associated with aggressive behavior were emphasized. We postulated that prolonged isolation from the early post-natal period may result in changes of brain macromolecular composition following an altered monoamine turnover rate and behavior in isolated rats may change when the rats are exposed to intense stimuli. Male Wistar rats were isolated for 12 weeks immediately after weaning and were exposed to electric foot shock of various intensities. The shock-elicited jumping behavior was calculated every ten min for 1 hr. Immediately after foot shock, rats were decapitated and brain monoamines and metabolites were measured by a fluorimetric procedure. The frequency of shock-elicited jumping in isolated rats was lower than that in grouped animals and the difference between two groups was the greatest with the most intense shock (70 V). This behavioral change was almost absent at the 3rd week of isolation, occurred at the 9th week, continued up to the 15th week and diminished by placing the rats into grouped housing. In these experimental situations, noradrenaline turnover was increased rather than serotonin, but there was no significant change between the two groups. Methamphetamine and chlorpromazine, stimulant and blocker of catecholaminergic neurons respectively, was also applied to both isolated and grouped rats in the situation of foot shock. Considering the different patterns on jumping with administration of these drugs, the behavior of isolated rats may be very characteristic because of the changed brain macromolecular composition of catecholaminergic neurons.