



Fig. 1. ———, Sleep latency; - - - -, total sleep time

an object waved in front of its eyes and moved about the cage.

There was a 48-h interval between each drug administration.

In the first experiment four animals were given a series of 42 injections of pentobarbital sodium and sleep latency was determined. The average sleep latencies in seconds in blocks of six injections for the four animals were as follows: 404, 318, 383, 379, 405, and 411. An analysis of variance of these six unit blocks of *S*s was performed. The between-blocks variance (in this case tolerance effect) was not significant. There was a significant difference between *S*'s in the effect of pentobarbital sodium on sleep latency time ($P=0.01$). A 43rd placebo injection (distilled water) was given after 48 h. No animal slept within a 30-min observation period, indicating no conditioning of the sleep response with the delay latency obtained in this experimental design.

In a second experiment six animals were given a series of 12 injections of pentobarbital sodium and both sleep latency and sleep length were measured. The results are shown in Fig. 1. A highly significant tolerance effect was present in the case of length of sleep. This effect was demonstrated within the first three trials. Four injections produced more than 50 per cent of the reduction in time of sleep. The length of sleep variable appears to become asymptotic after 5 injections. An analysis of variance of the latency data using blocks of three trials yielded no significant tolerance, *S*, or interaction effect; an analysis of variance of the sleep length data yielded significant *S* and tolerance variances, but no interaction effect ($P=0.01$ and 0.001 , respectively).

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Lateral Preferences in the Monkey

THERE is general agreement that the majority of monkeys show lateral preferences on a particular task¹⁻⁶, about as many animals showing a strong preference for the left hand as for the right. However, Ettliger⁵ reported that significantly more monkeys preferred to use the left hand than the right on their first discrimination task (irrespective of the task being visual or tactile). Seventeen of the 42 monkeys showed a strong preference for the left hand, six for the right and 19 animals showed weak or ambiguous preferences. Brookshire and Warren⁶, as a result of their more comprehensive investigation of lateral preferences under a variety of test conditions, wrote: "Four monkeys were judged to have had a predominantly right-hand preference, nine were judged left-handed, and six were considered either ambidextrous or without definite

preference". It is not yet known what factors are associated with the preferential use of a particular hand (left or right) on a given task⁶. If a significant asymmetry in the incidence of lateral preferences in favour of the left (or right) hand can be established it will be important to seek for neural or other correlates in a species which is generally considered to lack cerebral dominance.

Hand preferences have now been recorded for 27 unoperated immature rhesus monkeys, all receiving their first training on a simple tactile discrimination task. These animals were all housed and examined under constant conditions during the period 1962-64. Training, under standard conditions (40 daily trials, non-correction), was begun in the light but quickly (after 1-4 sessions) transferred to the dark. Two test-objects, a cylinder and a sphere, were made available on each trial. At first the animals were able to see these objects; afterwards they were only able to palpate them in the dark. Choice of the one object (cylinder), whether to left or right, was rewarded. The animals indicated their choice by pushing one test-object and thereby opening the lid of one food box. Following correct choice the animals were able to pick up a food reward (peanut) from the food box which was uncovered. Records were taken of the hand used to push the test-object (and, therefore, the lid of the box) on all trials; and also of the hand used to bring the food to the mouth on all rewarded trials. Responses made during initial trials in the light have been excluded from analysis. Separate tabulations were made for: (1) all the trials (totalling 3,585) in the dark during the stage of training before the animals reached a standard level of performance (90 per cent correct responses in 200 consecutive trials), (2) for trials 71-100 of the stage of training in the dark when the animals had reached the standard level of performance (a total of 810 trials). In addition, animals were individually graded as showing a left or right lateral preference if 90 per cent or more of their responses during either stage of training were made with a single hand.

Table 1. Number of trials on which response to the test-object (and also to the food reward on rewarded trials) was made with the left or right hand at two stages of training on a tactile discrimination task; and number of animals using the left or right hand for the test-object (and also the food reward on rewarded trials) in 90 per cent or more of trials, at two stages of training on the same task

Hand used:	Left	Right	$\chi^2 = 75.6$	Left	Right	$\chi^2 = 44.2$
Trials	1,925	1,422	$P < 0.001$	448	270	$P < 0.001$
			Binomial			Binomial
Animals	7	4	N.S.	12	7	N.S.
	During stage of training before performance is 90 per cent correct			During stage of training when performance is 90 per cent correct		

Trials on which animals used both hands to push the test-object, and rewarded trials on which different hands were used for the test-object and food reward, have been excluded from the table. Similarly, animals not using the same hand in 90 per cent of trials have been excluded from the analysis related to individual animals.

The results are shown in Table 1. At both stages of training there were significantly more trials on which the left hand was used in preference to the right hand. However, the number of animals showing left-hand preferences does not significantly exceed the number of right-handed animals. Nevertheless, it is noteworthy that a trend towards a greater incidence of left than right lateral preferences has been reported in two recent investigations^{5,6} and also in this communication.

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