

54. Lilly, John C. 1958. "Development of a Double-Table-Chair Method of Restraining Monkeys for Physiological and Psychological Research." J. Appl. Physiol. 12:134-136

Reprinted from THE JOURNAL OF APPLIED PHYSIOLOGY
Vol. 12, No. 1, January, 1958
Printed in U.S.A.

*Development of a Double-Table-Chair Method of Restraining
Monkeys for Physiological and Psychological Research*

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Development of a Double-Table-Chair Method of Restraining Monkeys for Physiological and Psychological Research

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THE development of a method for restraining monkeys is a pertinent example of the gradual evolution of a technique over many years by a number of workers, each of whom added a bit to the present form. Insofar as the present author can discover, each previous worker did not feel that his contribution was sufficiently novel to warrant full publication, and was content to consider his part of the development as part of the art in the field handed on from worker to worker in the fashion in which many techniques are transmitted. Since our research work and that of several other groups would have been impossible without this restraint technique we feel that it is important to report the developments.

This author's first need for the restraint of monkeys occurred during the course of a set of experiments on stimulation of the 'motor' cortex in the unanesthetized monkey in 1949 with Drs. William W. Chambers and George M. Austin. This work necessitated use of a means for connecting leads to implanted electrodes and for keeping the monkey's hands separated from his head and the leads. Dr. Chambers supplied us with a restraint consisting of a table-chair combination previously described (1), and subsequently mentioned by us (2). During 1949-50 essentially the same model was reduced to fit in a soundproof box and used for 25 pick-up and stimulation electrodes (2-20); this single table-chair is shown in figure 1.

This model was modified as follows: 1) two hand-holes and their covers in the 'neck' table for self-feeding were added; 2) the seat's bottom was removed and two plastic covered bars substituted to avoid pile-up of feces in the chair; 3) the seat was suspended below a second table of Lucite added at waist level to prevent the monkey reaching needles, etc. inserted into his legs by the operator.

Pictures of these chairs were first shown at the meetings of the American Physiological Society (3), the American Encephaloelectrographic Society (4), and at the International Physiological Congress in Copenhagen in 1950 (5). Subsequently, the method was shown at several meetings (6-11). Continuously since 1949-50 our work has depended on the use of this method (2-20).

During 1954, a new model with larger tables (36" x 36" instead of 18" x 18") was built to take care of large monkeys during mapping of motor movements; the larger size model kept their hands and feet free to demonstrate movements without giving the monkey something to grasp.

The design up to this time was given to Dr. John W. Mason who further improved it (21); we modified his version of the designs to keep the hands of the larger monkeys off the supports and walls (fig. 2).

Over the 8-year period, we have kept about 15 monkeys in this type of restraint for individual periods ranging from 6 weeks to 15 months continuously day and night. In our experience serious problems have arisen only from two kinds of monkeys: uncastrated females and males about to mature sexually. During estrus, the skin of the females becomes extremely delicate and they can develop pressure sores if kept in the restraint without respite for several weeks. Such problems were not encountered with one castrated female. After 14 months in the chair, one male developed a severe unilateral inguinal hernia apparently because of the continuous upright position at the critical time of maturation.

Early in this work, we found that this restraint exerts a taming influence on the *Macaca mulatta* within the first few days. Attachment between the monkey and the laboratory personnel who feed him develops rapidly and continues for the duration of the restraint.

The history insofar as we can determine of restraint of primates previous to our experience is as follows: the first use of a chair was in 1917 by Leyton and Sherrington (22, picture on p. 164). The first use of a restraint table and chair is that by Dr. Marion Hines in 1935 and is shown in figure 3; in this case the table prevented the removal by the monkey of electromyographic electrodes in his legs (personal communication from Dr. Hines). Subsequently, Drs. Hines and C. N. Woolsey have employed and further developed such restraints (personal communication from Dr. Woolsey).

Undoubtedly there have been developments in other laboratories which should be recorded in the interests of the furtherance of the sciences which need data from unanesthetized primates. It is

Received for publication September 16, 1957.



FIG. 1. A double-table chair for use in a soundproof box constructed from a refrigerator container.

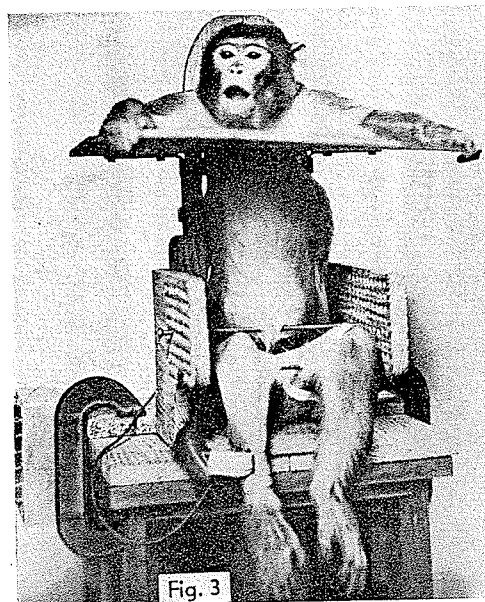


FIG. 3. An early model of a restraint chair and table devised and used by Dr. Marion Hines.

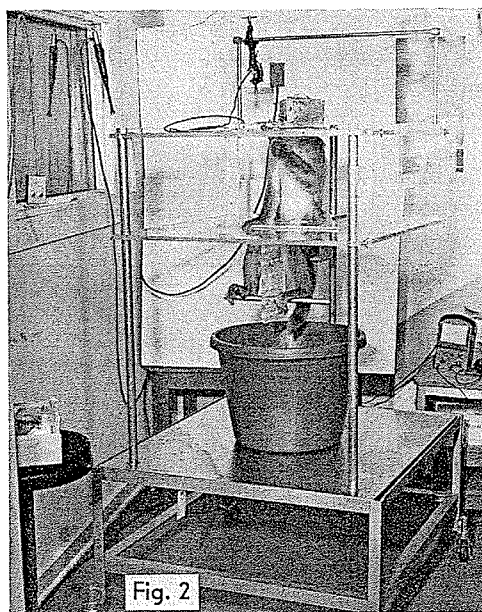


FIG. 2. A larger model of the restraint which prevents the animal holding onto the supports.

hoped that this note will stimulate those who have made such developments to report their techniques.

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