

We wish to emphasize the fact that great care must be used not to overdose the sensitized guinea-pig with chloral hydrate. A sensitized, as well as a normal guinea-pig, will recover from a large dose — considerably more than the amount mentioned above. But, apparently, the combined effects of the drug and the serum in a sensitized animal produce a deeper hypnosis than the drug when given alone.

Thus far, our experiments have been only with the intraperitoneal injection. Besredka's method of injecting directly into the brain will be taken up later and also the method of injection directly into the vessels according to Gay and Suthard and into the heart according to Lewis.

In a number of experiments with calcium chloride which Besredka claims to have a protective action, we were unable to save the sensitized animals. They died with characteristic symptoms of anaphylaxis.

We have also failed to substantiate Besredka's claims that sensitized guinea-pigs under the influence of ether narcosis are protected from the second injection of $\frac{1}{4}$ c.c. of serum into the brain. Neither does ether narcosis protect them when the injection is made directly into the vessel or directly into the heart. All the animals died with characteristic symptoms of anaphylaxis in from 2 to 6 minutes. Normal control guinea-pigs under the influence of ether narcosis showed no symptoms or ill effects when subjected to injections of physiological saline solution by the above methods.

In conclusion, we wish to add that, other chemical substances belonging to the same group as chloral may show similar action in protecting guinea-pigs against anaphylaxis.

36 (292)

The relation of plasticity to sex and age in the dancing mouse.

By **ROBERT M. YERKES.**

[From the Psychological Laboratory of Harvard University.]

Plasticity or the modifiability of behavior in the dancer has been studied by measurement of the rate of habit formation. The

habit of choosing a white box instead of a black box was established by means of systematic training, on the basis of the association of an electric shock with the latter. Each animal was subjected to ten tests daily until it chose correctly on three consecutive days. The habit was then considered perfect and the training ceased. We may speak of the number of tests necessary for the establishment of a perfect habit as the index of plasticity. The index, then, may be defined as the number of tests up to the point at which errors of choice ceased for at least three days.

In order to discover the relation of sex and age to plasticity five pairs of mice were trained for each of the ages, one, four, and seven months. The investigation is unfinished, as older individuals are to be tested.

TABLE: INDICES OF PLASTICITY.

Age.	Males.	Females.	Both.
1 month	82	106	94
4 months	128	106	117
7 months	192	146	169

In this table each index for the males and the females is the average for five individuals. In the last column the results for the sexes are combined.

Sex differences which appear in the above table.

1. At the age of one month the males learn more quickly than do the females. The males require only 82 tests; the females require 106 for the establishing of a perfect habit. Consequently the index of plasticity for the one-month males is 82; that for the one-month females, 106.

2. At the age of four months the opposite is true. The females learn much more quickly than the males. As the table shows, the index for the males is 128; that for the females 106.

3. At the age of seven months a similar relation holds.

Age differences which appear in the above table.

1. From one month to seven, at least, the plasticity of the male dancer steadily and rapidly decreases.

2. There is little change in the plasticity of the female dancer between the first and the fourth month. If anything the rapidity of learning tends to increase. Between the fourth and seventh

month a sharp decrease in plasticity occurs as is indicated by the rise of the index from 106 to 146.

3. The racial indices of modifiability, obtained by averaging the results for five individuals of each sex for each of the three ages mentioned, indicate a rapid decrease in plasticity from 94 at one month to 169 at seven months of age.

Discussion of these results is not in order in the present unfinished state of the investigation. I may say, however, that I am attempting to ascertain the duration of the sexual life of the dancer, and to discover the relation of plasticity to the strength of the electric stimulus which the animal learns to avoid.

37 (293)

The crystallography of hemoglobins.

By **EDWARD T. REICHERT** and **AMOS P. BROWN**.

[From the S. Weir Mitchell Laboratory of Physiology, University of Pennsylvania.]

The primary object of this research was to determine whether or not corresponding albuminous substances are identical. We believed that if non-identity were established we should have a fact of great fundamental importance in relation to heredity, the origin of species, etc. The crystallographic method was adopted because we believed that by this means we might succeed where the chemist has failed; and hemoglobin was selected as the first substance of our inquiry because of its comparatively ready crystallizability. Crystals from over one hundred species have been studied, and we have not only positively shown the non-identity of the hemoglobins, but have also brought to light much information of broad biological interest. From a preliminary review of our records certain facts stand out very prominently.

1. *The constancy of generic characters in the crystals.* — For instance, the genera that have been represented by a considerable number of species, as *Felis*, *Canis*, *Papio*, etc., show in each case constancy in the characters of the crystals in each genus, with marked differences both in axial ratios and in crystal systems between the