

Tyzzer, E. E. A study of inheritance in mice with reference to their susceptibility to transplantable tumours. *The Journal of Medical Research*, 1909, pp. 519—573.

This important paper contains a careful study of the susceptibility of different races of mice and of their hybrid offspring towards the growth of certain artificially implanted tumours. Three series of experiments are recorded dealing with the Jensen, the Ehrlich II, and a Japanese tumour respectively.

Two batches of common mice, one from Providence and the other derived from a Buffalo specimen crossed with a Cambridge individual, were inoculated with both the Jensen and the Ehrlich tumours at the same time. The Ehrlich tumour developed in 30% of the Providence mice and in 50% of the Buffalo ones. The Jensen tumour developed in 40% of the Buffalo mice but in none of the 12 Providence mice used. Offspring were raised from the insusceptible animals of both strains and though in neither case was a pure insusceptible strain obtained, the results nevertheless shewed that the Providence strain contained a markedly lower proportion of susceptible individuals than the Buffalo strain. The number of mice used in these experiments was however small and the author promises further information on the possibility of raising pure insusceptible strains.

At this point the Japanese waltzing mouse comes into the experiments and it is with these that the most interesting and striking results were obtained. In one experiment the same Jensen tumour was inoculated into 5 common mice, 5 Japanese, and 10 F_1 mice (Ex. common \times Japanese) of which 5 had a Japanese and the other 5 a common mouse as mother. The tumour developed rapidly in 4 out of the 5 common mice, but it failed to develop in any of the Japanese or of the F_1 mice. Only after a second inoculation did the tumour succeed in establishing itself in one of the F_1 animals, the rest remaining refractory as before as were also the pure Japanese.

A similar set of experiments on 20 mice was made with the Ehrlich tumour. It developed and thrived in all the 5 common mice but remained very small in the 4 Japanese in which it lived. On the fifth Japanese it failed to establish itself. The behaviour of the hybrids resembled the Japanese. In 5 of them it refused to develop, while in the remaining five it developed only to a small extent. With regard to both the Ehrlich and the Jensen tumour there are marked differences in susceptibility between the common and the Japanese mouse, and the hybrids resemble their Japanese parent. The fact that the F_1 mice from reciprocal crosses behaved similarly seems to shew that sex is not a factor in the transmission of susceptibility.

The results obtained with the Japanese tumour were sharper and cleaner cut, and for this reason a more extensive set of experiments was carried out. The Japanese race is highly susceptible to this tumour and out of 145 individuals inoculated only 3 failed to develop it. On the other hand all of the 48 common mice which were inoculated proved entirely refractory. The F_1 animals resembled the Japanese parents in being susceptible, and indeed the tumour thrived even more in them than in the parent. Of the 70 F_1 animals operated upon the inoculation only failed in a single instance. From these F_1 mice an F_2 generation was bred and 54 of these were inoculated. In not a single instance were the members of this generation

susceptible. The tumour failed to grow in all the 54, and those which exhibited the waltzing character were as insusceptible as the rest. From some of these F_2 animals an F_3 generation was raised, and the 16 individuals so formed all proved refractory to the development of the tumour. In these experiments the common mice used were all of the same strain. A few F_1 hybrids were also made between the Japanese and some common mice belonging to another and "alien" strain. Of the 13 F_1 animals raised and inoculated 5 proved to be susceptible and the other 8 were refractory. Though no individuals of the "alien" strain appear to have been directly tested this result points to constitutional differences in susceptibility among different strains of common mice otherwise indistinguishable.

For the student of heredity these are the most important results. The author also discusses the possible influence on susceptibility of other factors such as nutrition, moulting of the hair, and pregnancy, but considers that these are of minor importance compared with the factor of "biological race" which has hitherto been largely ignored in experiments of this nature.

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Sumner, Francis B. The reappearance in the offspring of artificially produced parental modifications. American Naturalist 44 1910, pp. 5—18.

— **An experimental study of somatic modifications and their reappearance in the offspring.** Arch. f. Entw.-Mech. 30 1910. (Festband für Roux.) 2. Teil, S. 317—348, 11 figg., tabl. XVI—XVIII.

Wenn weiße Hausmäuse einerseits in einem warmen Raume bei ca. 21, andererseits in einem kalten Raume bei etwa 5 Grad C gepflegt werden, so werden die beiden Partien allmählich recht verschieden voneinander. Sowohl die Zählung der Haare auf einem bestimmt abgegrenzten Hautbezirk als auch die Wägung der gesamten Haarmenge ergibt einen Überschuß auf Seite der Kältemäuse. Hingegen zeichnen sich die Wärmemäuse dadurch aus, daß gewisse periphere Körperteile, wie Schwänze, Ohren, Füße hinsichtlich der Durchschnittswerte ihrer Längen erheblich zunehmen. — Nach Induktion dieser Unterschiede kamen beide Partien in einen gemeinsamen Zuchttraum von mittlerer Temperatur und wurden hier zur Fortpflanzung gebracht. Trotz der identischen Temperaturverhältnisse waren auch die Kalt- bzw. Warmraumnachkommen voneinander deutlich an denselben Merkmalen zu unterscheiden, welche bereits die Eltern ausgezeichnet hatten. Um jeden Zufall auszuschließen, wurde dies nicht nur durch Berechnung des groben Durchschnittes erhoben, sondern durch Vergleich zwischen Durchschnittswerten, die in der Weise für jede Gruppe aufgestellt sind, daß die Mäuse erst nach der Größe in Gruppen geteilt wurden, dann diese Gruppen noch weiter in Unterabteilungen nach dem Geschlecht. Am deutlichsten sind die Unterschiede, wenn die Jungen im Alter von 6 Wochen gemessen wurden; im Alter von $3\frac{1}{2}$ Monaten waren sie nicht mehr so auffallend. Die Weibchen schienen eher als die Männchen dazu zu neigen, die erworbenen Differenzen wieder auszugleichen und einander gleich zu werden.

Auf die theoretischen Erwägungen des Verfassers gehe ich in dieser Zeitschrift nicht näher ein, da es hier doch hauptsächlich auf den Bericht der bloßen Tatsachen ankommt. Es sei nur das Endresultat wiedergegeben, welches den Verfasser nach sorgfältiger Diskussion aller Möglichkeiten dazu bringt, doch die Vererbung somatogener Eigenschaften entweder im alten Darwinschen Pangenesis-Sinne am wahrscheinlichsten zu halten, oder wenigstens in dem Sinne, daß durch den Außeneinfluß, hier die Wärme,