EFFECT OF TEMPERATURE ON GROWTH IN WEIGHT AND TAIL-LENGTH OF INBRED AND HYBRID MICE

PHYSIOLOGICAL processes of acclimatization to high temperatures have been investigated for a number of organisms, but the effects of temperature on growth have received little attention. It is known, however, that growth in body-weight in the few subjects studied is greatly influenced by external temperature, and that there exists an inverse relationship between temperature and body size. It has also been shown for some organisms that buffering against external environment is better in first-generation hybrids than in inbreds. These considerations were kept in mind in recent experiments carried out by Prof. G. A. Harrison, Mr. R. J. Morton and Dr. J. S. Weiner*.

The material studied consisted of four inbred strains of mice and the six possible hybrids between them. Reciprocal crosses were included. It is shown that growth in body weight is partly determined by environmental temperature (70° F., 61° F. (control) and 90° F.). The weight of young heat-treated mice usually increases more rapidly than that of the controls, but at later ages the latter generally grow more rapidly. The magnitude and direction

of the environmentally determined responses depend on the particular genotype.

Growth of F_1 hybrids in the two environments is more similar than the growth of their inbred parents, and differences in hybrid response are smaller than the corresponding inbred differences.

Hybrids in any one environment usually have a smaller variability than homozygotes—indicative of their greater homeostasis. One inbred resembled the hybrids in weight variance and weight responses, and the important conclusion emerges that inbreeding does not necessarily mean marked reduction in somatic fitness. The authors, however, do not put forward any explanation of this circumstance. It is perhaps possible that, as in maize, resistance to inbreeding may be genetically determined.

Growth in tail-length is also in part determined by environmental temperature; the higher the temperature the faster the growth-rate, and the longer the tail. The magnitude of the response again depends on genotype, though maternal environment plays some part. Hybrids have a smaller variability in both environments, and the totality of the evidence supports the hypothesis that the hybrids have a greater developmental flexibility than the inbreds.

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* Phil. Trans. Roy. Soc. of London. Series B: Biological Sciences. No. 695, Vol. 242 (4 September, 1959): The Growth in Weight and Tail Length of Inbred and Hybrid Mice Reared at Two Different Temperatures. By Prof. G. A. Harrison, R. J. Morton and Dr. J. S. Weiner. Pp. 479-516. (London: Royal Society, 1959.) 12s.

SCIENTISTS AND ADMINISTRATION

THE description of the Laboratory of the Government Chemist in *State Service* (40, No. 3; March 1960) is a reminder that Government concern with scientific research is no new thing. Even earlier examples were the Royal Observatory (1675) and the Geological Survey (1835), and later the Patent Office (1852), the National Physical Laboratory (1903), the Medical Research Council (1913), the Department of Scientific and Industrial Research (1916) and the Agricultural Research Council (1916).

Quite apart from research to meet the needs of the Armed Services, Government research must be undertaken in order that the Executive may reach all its decisions on the best possible scientific advice, and in order that aspects of national life for which industry is either unable or unwilling to undertake responsibility shall not be neglected; aspects of such are fire, corrosion, afforestation, river pollution, coast erosion as well as problems in the building, transport and mechanical engineering fields. The new challenge of outer space is also throwing up problems calling for Government initiative in research and co-ordination.

The Institution of Professional Civil Servants believes that not only the scientific needs of government in the modern industrial State, but also the scientific needs of the State itself, can be adequately met only if the government is fully responsible for much research work. But the majority of the administrative class of the Civil Service appears to be proud of its scientific ignorance. This attitude is a

grave handicap which could be partially overcome through a leavening of the Administrative Class by a deliberate policy of moving scientists into it.

One major difference between government research establishments and those in industry is that the scientists in the latter frequently have the opportunity to move into production and other fields of management.

In this respect the government service lags behind industry. The introduction of men with a scientific background into executive departments would be of benefit to both. Such scientists should undergo a period of administration to fit them to make a full contribution to the art.

When this type of movement occurs there should be no differentiation, either financially or otherwise, between the scientist-administrator and his colleagues trained in other disciplines. The transfer of scientists to administrative work should not be as if to a higher sphere of activity, but to introduce into administration scientists suitable for administrative duties. To ensure the maximum opportunity to develop and demonstrate administrative ability, much more use should be made of secondment to the headquarters offices of their department at all levels.

Apart from such administrative opportunities, the young scientist could obtain valuable experience in connexion with his own research work if he were encouraged to take an independent view and to express his opinions on his own work and the research programmes of his establishment. Research work is