DEOXYRIBONUCLEIC ACID AND GENETIC MODIFICATION IN DUCKS

IT was natural that the genetic transformation of bacteria effected by the introduction of foreign deoxyribonucleic acid should lead to speculation as to whether the phenomenon could also be induced in higher forms. That similar treatment should be capable not only of altering the racial characteristics of the growing vertebrate but that such changes would also be heritable seemed one of the least likely outcomes of such an experiment.

Recently published reports by Benoit *et al.*[1] state that they have succeeded in changing the characteristics of ducks of one breed by injections of deoxyribonucleic acid from another, and that the modifications continued to be identifiable in the progeny of the treated birds.

Because of the importance that must be attached to such revolutionary claims, and in the absence, as yet, of substantive evidence from repeat experiments, the work of Benoit and his colleagues should be subjected to critical scrutiny.

In the first place it might be suggested that, even with the most meticulous records, proof of somatic transformations of the kind described (size, weight, form of head, bill colour, carriage of body and the general aspect) would be difficult to establish in this species without an appreciation of the range of variability.

This is because there is not only considerable lack of knowledge of the genetics of the duck, but at times the development of breeds depended upon predilection for improvement by the sporadic introduction of other varieties, and this has provided many so-called pure breeds with a cryptic hereditary constitution not always to be expected from their apparent origins.

Preliminary to the experiment the birds were obtained from a reputable breeder and the weekly injections commenced when the Pekin ducklings were 8 days old. Of thirty-six ducklings, twelve (3 males, 9 females) were chosen at random for injection of deoxyribonucleic acid derived from blood and testes of Khaki Campbell drakes, and the remainder kept as controls. Total amounts of deoxyribonucleic acid injected were 5 mgm. per bird for the males and 61 mgm. for the females over a period of 5 weeks and 19 weeks respectively. One male and eight females developed the pronounced somatic modifications described. The females matured normally and laid eggs which, fertilized by treated males, produced twenty-six ducklings, 73 per cent of them having atypically coloured bills, and a good number actually showing other somatic modifications.

Bill colour in the Pekin breed is orange-yellow, and in the Khaki Campbell a greenish black. It may be of significance that a defect of the Pekin listed in British Poultry Standards is "Black marks or spots on the bill".

Although considerable time would appear to have elapsed between the end of the injection period and the discovery of the modifications, the findings, if and when substantiated, would, like the proof of vegetative hybridization, have a tremendous impact on genetic theory and practice.

For the moment it would be as well to agree with Benoit and his colleagues that "Aujourd'hui, notre meilleure conclusion sera que nous n'avons aucune conclusion à vous présenter", and await the repetition and extension of this work by them and others who will, no doubt, be stimulated by the reports.

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[1] Benoit, J., LeRoy, P., Vendrely, C., and Vendrely, R., *C.R. Acad. Sci. Paris*, **244**, 2320 (1957); **245**, 448 (1957); *La Presse Médicale*, 65 Année, No. 72, 1623 (1957).

UNION OBSERVATORY, JOHANNESBURG

THE annual report of the Union Observatory, Johannesburg, for 1956 (which appeared in October 1957) follows the usual lines, and it will be sufficient to refer to the main events during the period under consideration. The 26½-in. refractor was used with the interferometer by Dr. W. S. Finsen for the measurement of double stars and the discovery of new ones on 135 nights, and on 68 nights for colour photography of Mars. In addition, Mr. J. Churms and Dr. W. H. van den Bos used it on 68 nights for the measurement of known double stars. Messrs. J. A. Bruwer and Churms, with a number of amateur astronomers who are members of the Transvaal Branch of the Astronomical Society of South Africa, used the 9-in. refractor on 179 nights for observations of planets, variable stars, etc., the amateurs rendering valuable assistance to the staff on visiting evenings and in many other ways. The results of the occultation observations were communicated to H.M. Nautical Almanac Office.

The Franklin–Adams telescope at the Hartbeestport Annexe obtained 178 plates for minor planets and 23 plates for comets, and the resulting positions were regularly communicated to the respective central bureaux of the International Astronomical Union at Cincinnati and Copenhagen. Dr. Finsen devoted much of his leisure time to the preparation of composite enlargements from the colour films of Mars obtained during the favourable opposition of 1954 and 1956. The card catalogue of double stars south of − 19° dec. has been kept up to date, and information has been supplied to other astronomers on request.

With the 3-in. refractor sunspot counts were obtained on 281 days, the other days being overcast or unsuitable for reliable counts. The results have been regularly communicated to the Telecommunication Research Laboratory of the South African Council for Scientific and Industrial Research, the Magnetic Observatory at Hermanus and the Receiving