

constitutes a good coefficient of consistency. For the Janvrin cases these coefficients are 25, 6, 3. The percentual variations are measures of ataxia; the coefficients of consistency are measures of eutaxia. The determination of laryngeal taxa thus becomes a quantitative one.

This is an illustration of the change that is occurring in replacing the often unreliable methods of clinical diagnosis by numerical expressions obtained from measurements.

E. W. SCRIPTURE.

¹ Janvrin, "Diagnosis of a Nervous Disease by Sound Tracks", NATURE, 132, 642, Oct. 21, 1933.

Inheritance of Egg-Colour in the 'Parasitic' Cuckoos

THERE are many kinds of cuckoos in the Old World with so-called parasitic habits, which are more or less catholic in their choice of fosterers. One female, however, in normal circumstances places all its eggs in the care of a single species of host¹, and as a rule its eggs show a higher or lower degree of resemblance to those of that species.

This mimicry of eggs is a well-attested fact and led A. Newton¹ to suggest that any particular species of cuckoo, for example, the common cuckoo of Europe (*Cuculus canorus* L.), is divided into a number of clans or *gentes*, one for each of the normal hosts, each of which has perfected a certain type of mimetic egg by natural selection. There is evidence that such selection (performed by the fosterer) does take place². More recent authors, for example, Jourdain, support Newton's theory of the existence of gentes.

This would require no further comment but for the fact that cuckoos are known to be polyandrous, or, more probably, promiscuous in mating. We have therefore to face the problem of how under these conditions the clans can possibly be kept distinct. This difficulty has long been realised but never satisfactorily solved³. It has generally been said, albeit with little conviction, that isolation of the gentes is sufficient to keep the clans unmixed; and though this may be true of certain parts of continental Europe, it does not appear to be true either of England or of New South Wales⁴.

About two years ago, the following simple solution occurred to me, and I referred it to the Rev. F. C. R. Jourdain. He replied that in his opinion isolation is the all-important factor; that over great stretches of Europe where a very high degree of mimicry obtains, the cuckoo is automatically confined to one species of fosterer, whereas in England where fosterers are many and mixed, the mimicry is comparatively imperfect; in short, that the theory here suggested is unnecessary to explain the facts.

In a recent paper⁴, Chisholm raises the same problem in describing the habits of some nine Australian species, all parasitic, and leaves the 'pretty tangle' unsolved. I am therefore tempted, with due deference to the Rev. Jourdain's authoritative opinion, to publish my theory, since it has the advantage of being universally applicable whether right or wrong.

The factor for egg-colour, and the appropriate instincts regulating the egg's disposal, which must go along with it, may collectively be called the 'gens factor'. The different gens factors are presumably a series of multiple allelomorphs, which I suppose to be *sex-linked*, that is to say, located in the X-chromosomes. In birds, the female is the heterogametic sex; and thus the female cuckoo, having only one X-chromosome, can never be heterozygous

for gens. The fact that the male has a pair does not matter because he does not lay eggs: he does not, in fact, belong to the gens at all.

It should be noted that the eggshell and its pigment are part of the parent and have nothing to do with the embryo inside. One female cuckoo will always lay exactly the same type of egg, a well-known observational fact.

It is impossible to go into the interesting implications of this type of inheritance here. It implies, for example, that the female offspring of any particular cuckoo will probably belong to more than one gens, and that they do not necessarily return as adults (as is universally assumed^{4,5}) to the nests of the species which reared them. A mechanism is also provided for stabilising the population by damping the fluctuations caused by the host species, and at the same time allowing for a slow increase or decrease in response to permanent changes in their status. I might add that it seems likely from the evidence that there are some autosomal modifiers for gens, causing the observed differences between the eggs of individual females belonging to one and the same clan.

V. C. WYNNE-EDWARDS.

Department of Zoology,
McGill University,
Montreal.
Oct. 25.

¹ "Dictionary of Birds", p. 124; 1893.

² F. C. R. Jourdain, *Proc. Zool. Soc.*, p. 648; 1925.

³ W. P. Pycraft, "A History of Birds", p. 130; 1910.

⁴ A. H. Chisholm, *Auk*, L., pp. 385-395; Oct. 1933.

⁵ E. Chance, "The Cuckoo's Secret", p. 226; 1922.

Morphological Interpretation of Floral Anatomy

IN the recent issue of the *New Phytologist*¹, Mrs. Agnes Arber, in a paper dealing with the above subject, raises certain points which are of fundamental importance to all plant morphologists. She discusses the use of anatomical evidence in phylogenetic morphology and comes to conclusions which are directly opposed to one of the well-established doctrines of modern comparative morphology. To the question, "Are we to consider it proven that the vascular bundles are more 'conservative' than the external form, so that vestigial organs may be represented by their bundles, when all external trace of these organs has disappeared", her answer is that "we have no alternative but to discard the doctrine of the conservatism of the vascular bundles". Proceeding further, she says, "there seems to be no escape from the conclusion that there is a complete absence of positive evidence for the vestigial survival of vascular tissue after the organ which it supplied has ceased to exist". She admits that the general nature of the vascular scheme may have a certain systematic value and may serve to some extent as an indicator of trends in race history, but in her opinion there appears to be no basis, say, for the statement of Bower² that "anatomical characters and of the vascular system are apt to tardily follow evolutionary progress and thereafter to persist as vestigia" (*italics mine*).

Mrs. Arber appears to be partially right in this, especially because an unintelligent use of the above doctrine has sometimes led to the formulation of peculiar hypotheses, like the theory of carpel polymorphism, but her whole argument seems to be too much exaggerated. In her evidence she takes into consideration some highly specialised grasses, like