

towards the northern end of the Rukwa trough, while the Malagarasi depression is conspicuously hilly.

No vegetation maps of the region in any greater detail than that of Engler<sup>2</sup> exist, and that errs in giving the *Hochweide* too great and continuous a range, right across the Karema gap; but for the present purpose the important point is that evergreen forest remains practically only in small patches in the three highland areas. 'Miombo' (*Brachystegia*—*Isobrerlinia*) deciduous woodland or, in Ufipa, open grassland, predominates all down the east side of Lake Tanganyika.

From the foregoing it might be expected that the mountain and forest fauna of the Kungwe highland would show northern and southern affinities in roughly equal proportions, with a slight preponderance of the former due to the better 'stepping stones' available across the Malagarasi depression than across the Karema gap. Recent collections of birds made on Kungwe and in Ufipa for the British Museum show that the avifaunal composition on Kungwe differs greatly from expectation, as follows<sup>3</sup>: (1) Total number of species: Kungwe 41, Ufipa 29. (2) Number of 'widespread' species, that is, occurring both farther north and farther south than Lake Tanganyika: Kungwe 16 (39 per cent), Ufipa 17 (58 per cent). (3) Number of purely 'northern' species: Kungwe 21 (51 per cent), Ufipa 3 (10 per cent). (4) Number of purely 'southern' species: Kungwe 2 (5 per cent), Ufipa 9 (31 per cent).

The remaining two species on Kungwe are regarded as endemics; the two 'southern' species on Kungwe are both very strongly marked sub-species, while of the three 'northern' species that reach Ufipa two are subspecifically distinct.

In conjunction with the foregoing evidence we have the fact that the chimpanzee extends south so far as the south edge of the Kungwe highland (latitude 6° 30' S.), but there is no indication of the animal in Ufipa. The conclusion is that the Karema gap is of much greater zoo-geographical significance than the Malagarasi depression. I am indebted to Mr. Clement Gillman for a discussion of the local geology and for references. Certain of these<sup>4,5,6,7</sup> show an increasing tendency to regard the Karema gap as representing an ancient south-east—north-west rift, which reappears west of Lake Tanganyika in the Lukuga depression at Albertville. This rift was probably earlier than the Rukwa—Nyasa trough and certainly much earlier than the Pleistocene rift now occupied by Lake Tanganyika. Moreover, the efficiency of the Karema gap as a barrier to animals would have been increased by the water connexion that it appears to have provided between Lakes Tanganyika and Rukwa in geologically recent times<sup>8</sup>.

In this instance faunistic and admittedly as yet tentative geological evidence give each other powerful support.

R. E. MOREAU.

East African Agricultural Research Station,  
Amani.  
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<sup>1</sup> Tanganyika Territory 1/2 mill.; Tabora South B 36 1/1 mill. Survey Div. Dar es Salaam, 1941.

<sup>2</sup> Engler, A., "Pflanzenwelt Afrikas", 1 (Leipzig, 1910).

<sup>3</sup> Moreau, R. E., *Ibis* (in the press).

<sup>4</sup> Moore, J. E. S., "The Tanganyika Problem" (London, 1903).

<sup>5</sup> Scholz, E., *Pflanzer*, 10, 80 (1914).

<sup>6</sup> Teale, E., Tang. Terr. Geol. Surv. Ann. Rep. 1930, 12 (1931).

<sup>7</sup> De la Vallée Poussin, J., *Bull. Soc. Belge Geol.*, 46, 330 (1936).

<sup>8</sup> Cox, I. R., *Proc. Malacol. Soc.*, 23, 242 (1939).

## Relation between Dissonance and Context

THE effect of musical context on dissonance, discussed by Gardner and Pickford in *NATURE* of September 25, is so much a part of the musician's everyday experience that he will probably regard an experimental programme to establish the existence of this effect as entirely redundant.

A simple illustration of the bearing of context on dissonance may be obtained on a pianoforte by playing middle *C* together with its seventh (*B* natural) and octave. As an isolated sound this is unpleasant. Now play the scale of *C* major introducing the keynote and octave each time. This time the effect of the penultimate dissonance is entirely different, although it is precisely the same combination as before. It now takes its place in a regular progression towards the keynote, and when the seventh is introduced the anticipation of the approaching resolution into the major chord is intensely stimulating.

Herein lies the secret of the effect. If the dissonance is introduced in such a way that the trained ear can anticipate its resolution by regular progression, then that anticipation gives rise to pleasure which so heavily outweighs the jarring of the isolated sound that this jarring escapes notice and the net effect is one of satisfaction.

I recently ventured to criticize a discord in a composition which one of my friends had just completed, and was met by the argument that "Chopin used that discord a great deal". So he did—but always in a way which gave rise to the pleasurable anticipation of its resolution.

C. G. GRAY.

In his interesting letter Mr. Gray has put forward the theory that dissonances, which he assumes to be constant in harshness whatever their contexts, may be masked or softened by the pleasure of the musical experience of their anticipated resolution, when heard by a man whose training enables him to make that anticipation.

Gardner and Pickford, in their letter in *NATURE* of September 25, explained that the question of pleasure, or rather of liking and disliking, was avoided so far as possible in their experiment. They were concerned with the more subtle, though no less interesting question, whether the dissonance level of a chord might itself be subject to variation owing to the context, and apart from special musical training. In other words, they raised the question whether dissonance itself, which is an experience, not an object, may be relative, not the question whether pleasure may mask it.

The resort to experimental research certainly does not in any way supersede or render useless expert observations of the kind Mr. Gray is able to make, but it allows us to focus attention upon special points effectively and gives us the opportunity of utilizing carefully balanced evidence. It would be valuable if Mr. Gray could construct a series of examples of varying complexity which illustrate his theme and which could be used in a short experiment.

R. W. PICKFORD.

Psychology Department,  
The University,  
Glasgow, W.2.