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Taste-testing the Anthropoid Apes

AT the recent International Congress of Genetics at Edinburgh, in the course of discussions on the possibility that the blood-group frequencies found in man were determined by a balance of selective influences, it occurred to one of the authors that evidence on the parallel possibility for taste-testing could be obtained by testing the anthropoid apes.

By the courtesy of Prof. F. A. Crew and Dr. Gillespie of the Edinburgh Zoo, a preliminary test was carried out before the Congress ended, which was successful in showing that, when the animals are calm and free from interference by others in the same cage, the test can be made without ambiguity, and that both tasters and non-tasters exist among the chimpanzees.

We have since tested nearly all the anthropoid apes in the Zoological Society's collections at Regent's Park and Whipsnade. The solutions used contained 2 per cent sucrose to make them moderately attractive, and, except for this, were equivalent to Nos. 3, 6 and 9 of the standard series used at the Galton Laboratory, where they were prepared. They contained respectively $\frac{1}{4}$, 50 and 400 parts per million phenyl-thiocarbamide. Human tasters would generally find the first perceptibly bitter, but not necessarily unpleasant if the sugar were desired ; the second would be, to most tasters, unpleasantly bitter, and the third decidedly so. Non-tasters might notice some slight bitterness at the strongest level. The apes tested must have similar sensory perceptions at these strengths, for those classified as non-tasters continued to accept the strongest solution, while the 'tasters' showed reluctance or aversion, sometimes with the weak, and always with the medium solution. The strong solution was used whenever possible for confirmation.

With the exception of one chimpanzee, which was too shy to be tested, the results are shown in the following table (E, R, and W stand for Edinburgh, Regent's Park and Whipsnade) :

Chimpanzees tested

	Females			Total	Males			Total	Both sexes
	E	R	W		E	R	W		
Tasters ..	2	7	2	11	4	2	3	9	20
Non-tasters ..	1	1	1	3	1	3	-	4	7
Total ..	3	8	3	14	5	5	3	13	27

Thus the chimpanzees show 7 non-tasters out of 27, or 26 per cent. Experience with man also gives regularly about 25-30 per cent.

The young female Jaqueline, both of whose parents are in the Regent's Park collection, and both non-tasters, was omitted from the table of frequencies, since her reaction as non-taster, while it confirms the genetical similarity of the situation in the apes and in man, adds nothing to our knowledge of the gene frequency in the apes.

With the orang-utan we found one male non-taster at Edinburgh, and two tasters, male and female, at Whipsnade. Two male gorillas at Regent's Park were both tasters. Two Whipsnade specimens of the gibbon (*Hylobates concolor*) were both tasters, but *H. lar lar* and *H. lar agilis* at Regent's Park were non-tasters. Numerous tests on primates and other mammals are in progress.

The existence of a dimorphism in the taste test, parallel to that known in man, in at least two of the manlike apes, is a most remarkable fact. Its significance is emphasized by the circumstance that, certainly in the chimpanzee, the proportion of tasters to non-tasters is nearly the same as in human populations, which, as Boyd has shown, vary somewhat among themselves. Without the conditions of stable equilibrium it is scarcely conceivable that the generatio should have remained the same over the million or more generations which have elapsed since the separation of the anthropoid and hominid stocks. The remarkable inference follows that over this period the heterozygotes for this apparently valueless character have enjoyed a selective advantage over both the homozygotes, and this, both in the lineage of the evolving chimpanzees and in that of evolving

man. Wherein the selective advantages lie, it would at present be useless to conjecture, but of the existence of a stably balanced and enduring dimorphism determined by this gene there can be no room for doubt.

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