original work. As scorer, I might have been influenced by Hamilton's enthusiastic mention of particular species in early stages, and he had seen some of the parasite data, but several of the data sets used were added to the analysis after I had ranked the birds, and thus the final associations were truly unknown.

A final point concerns the finding that rarely-trapped birds show the correlation between brightness and parasites more strongly than commonly caught ones. I find this discovery intriguing, and can devise several explanations for it, including ones which support our hypothesis. For example, suppose that many different evolutionary forces, including the one suggested by us[2] have contributed to the showiness of birds. Birds might be rarely netted either because they are genuinely rare, or because for some reason they can usually avoid capture, either as a general rule or in the particular habitat in which the net is set. If sick birds, with large numbers of parasites, find it more difficult to elude the mist nets, and these tend to belong to showier species because of the operation of the mechanism we have suggested, then the relationship between rarity and the strength of the correlation reported by Read and Harvey is expected. Obviously other explanations can be constructed but as it stands, the result neither supports nor refutes our hypothesis. Likewise, the association with phylogeny is interesting, but has other possible explanations besides that of an "artefact".

Comparative work is rife with pitfalls[7], and the possibility of previously unconsidered ecological or other factors confounding the results is always present. The generality of correlation between parasite prevalence and showiness still appears robust; the next challenges are to test the hypothesis within species[8] and to elucidate more carefully the meaning of sexually selected characters to animals in their natural environments.

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READ AND HARVEY REPLY—Zuk claims that the comparative data we used to test the parasite theory of sexual selection[2] produces significant correlations between male brightness and parasite prevalence in passerine birds. That claim is wrong because it is based on cross-species correlations. It is well established that the non-independence of species points means that probability values attached to cross-species correlations are invalid unless phylogenetic associations have been statistically controlled for[3,7,9–11]. The non-significant correlations presented in our original paper using analyses which control for phylogeny are not altered by considering the prediction as one-tailed[1].

Whether there is justification for using one-tailed statistics, as Zuk claims that there is, will be relevant to future comparative tests of Hamilton and Zuk's theory[2]. The question is whether both positive and negative associations between showiness and parasite load might evolve as a consequence of female choice based on showiness for resistant males. The answer hinges on whether female choice of resistant males increases resistance in a host populatilon.

Hamilton and Zuk[2] assumed that it did not and they therefore predicted a positive correlation. If however, parasite load is reduced as a consequence of female choice for resistant mates, showiness might become negatively correlated with parasite load. The strength of natural selection against the evolution of bright coloration can be expected to differ among species, thus leading to different solutions to the conflict between the opposing forces of natural selection for dull coloration and sexual selection for bright coloration. Females of bright species will, according to Hamilton and Zuk's theory, more accurately assess resistance among males. Thus resistant males will obtain a greater mating advantage in brighter species, which will consequently harbour a lower parasite load. We know of no data which bear on the issue of whether female choice increases resistance in the host population. In the meantime, therefore, it seems prudent to consider the comparative prediction as two-tailed.

Zuk questions our reasons for re-scoring the showiness of European birds[3,6]. As we stated[1], our failure to replicate the patterns found using Hamilton and Zuk's[2] scores of the North American birds led us to investigate further the European birds. We had these latter birds re-scored because we wanted replicable scores by independent assessors. The best showiness criteria for such an exercise were surely those given by Hamilton and Zuk in their original paper[2], rather than those used for other purposes[6].

As it stands, Zuk's suggestion for the low sample size effect fails to explain why parasite prevalence and brighness covary only in species in which only a few birds have been sampled for haematozoa.

Zuk[1] points out that in addition to the criteria given in the original paper[8], she emphasized structural and display characters when scoring bird showiness. We are left wondering which characters were used, and how they were weighted so that the exercise can be repeated by other scorers. Zuk provides no reason for us to alter our original conclusion[1]. Our comparative analyses do not provide general support for Hamilton and Zuk's theory.

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Cold fusion ideas

SIR—In the excitement about the possibility of chemically induced nuclear fusion[1,2], there is a danger that observations may be considered indicative of fusion when more conventional explanations from cognate fields are overlooked[3]. We wish to draw attention to two such cases.

First, consider an experiment in which identical currents are passed through identical electrolytic cells containing electrolytes differing only in the substitution of heavy water (D_2O) for H_2O, and the temperature of each cell is monitored. It has long been established that the viscosity of D_2O is appreciably higher than that of H_2O (1.26×10^{-4} Pa s and 1.009×10^{-4} Pa s at 20 °C, respectively)[4]. Making the assumption that H_2O/D_2O systems obey Walden's rule[5], the resistivity of a salt solution in D_2O will be 25 per cent higher than the corresponding solution in H_2O; for a 0.1 M lithium acetate electrolyte solution, running at a current density of ~0.1 A cm^{-2} (ref. 2) between electrodes 1 cm apart, this will correspond to an excess heat generation in the D_2O solution relative to the H_2O solution of ~1.4 W per cm^2 of electrode surface. The effect should be still more marked with a strong acid or strong alkali (for example, LiOD) as electrolyte, where the conduction mechanism involves H/D tunnelling. We have checked that heat differentials of this order are in fact observed; we find that such cells typically run with D_2O 2–3 °C hotter than H_2O, with an overall temperature rise of 10 °C above ambient.

As a second example, tritium atoms should be produced in the proposed fusion reactions[1,2], and scintillation measurements of tritium decay have been reported[2]. There have been suggestions that tritium has been detected mass spectrometrically as the ion DT^+ (with a mass/charge ratio of 5 a.m.u.). In such an experiment the gas that diffuses through the walls of a closed palladium tube, which forms the cathode of an electrolytic cell, is