50 Years Ago

Recent investigations have shown that the fluoride content of Greek teeth from the cities of Athens and Salonika was considerably high. This may explain, at least in part, the low prevalence of dental caries observed in Greece … With the exception of sea salt, however, the fluoride content of other foods commonly produced and consumed in Greece is not known … The analyses showed that the fluoride content of olive oil from the Island of Crete was 0.36 p.p.m. and that from the area of Kalamai 0.63 p.p.m … it appears that the inclusion of olive oil in the daily Greek diet does not make any significant contribution to the amount of ingested fluoride. Thus, at present, sea salt remains an important source of dietary fluoride in Greece for protection against dental caries. This may well be the case in other countries, such as Taiwan, Ceylon and Lebanon, where because of local food customs the amount of sea salt consumed has been estimated to be considerable: about 16–20 g per person per day.
From *Nature* 14 March 1964

100 Years Ago

Think of the Niagaras of speech pouring silently through the New York telephone exchanges where they are sorted out, given a new direction, and delivered audibly perhaps a thousand miles away. New York has 450,000 instruments — twice the number of those in London. Los Angeles has a telephone to every four inhabitants … Our whole social structure has been reorganised. We have been brought together in a single parlour for conversation and to conduct affairs, because the American Telephone and Telegraph company spends annually for research … a sum greater than the total income of many universities.
From *Nature* 12 March 1914

Initial experiments to address these questions have failed to provide clear answers. Coen *et al.* show that song transitions are similar whether or not the singer is ultimately successful in mating. Yet pheromone-insensitive males, who sing for normal durations but have altered song patterning[8], tend to be slower and less successful in convincing females to mate[1,8]. Whether these flies are handicapped in the courting game because of a defect in how they vary their songs, or because of unrelated effects, remains to be seen. But whether song patterning matters to females or not, we now know that its variability, and probably the variability of many other 'fixed' behaviours, is not simply the consequence of noise in nervous-system function[6,7]. Rather, a sizeable fraction of that variability is likely to reflect computations performed by reliable and predictable brains on an ever-changing sensory environment.

Importantly, this insight was made possible by simultaneously observing, at high temporal resolution, the sensory environment and behavioural output of a genetically tractable organism during a complex social interaction. Such detailed analysis applied to natural behaviours has the power, as Coen *et al.* aptly demonstrate, to distil seemingly complex and unpredictable behavioural patterns into simple rules and sensorimotor transformations[9,10]. With such an approach, rather than being the fog that prevents us from understanding nervous-system function, behavioural variability and complexity can be the searchlight that helps us to identify the computational problems that brains evolved to solve. ■

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EVOLUTIONARY BIOLOGY

Speciation undone

Hybridization can cause two species to fuse into a single population. New observations suggest that two species of Darwin's finches are hybridizing on a Galapagos island, and that a third one has disappeared through interbreeding.

PETER R. GRANT & B. ROSEMARY GRANT

The process of speciation, in which one species splits into two, is vulnerable to collapse in its early stages through interbreeding and the exchange of genes, a process referred to as introgression. As explained by the evolutionary biologist Theodosius Dobzhansky[1], "Introgressive hybridization may, then, be a passing stage in the process of species formation. On the other hand, the adaptive value of hybrids may be as high as that of their parent; introgressive hybridization may lead to obliteration of the differences between the incipient species and their fusion into a single variable one, thus undoing the result of the previous divergent development." Writing in *American Naturalist*, Kleindorfer *et al.*[2] offer a possible example of this process, in a study suggesting that one population of Darwin's finches has become extinct through interbreeding with another.

Until Kleindorfer and colleagues' report, three species of tree finch were known to occur together in the highlands of Floreana Island in the Galapagos (Fig. 1). They differ in body size and in the size and shape of the beak, but, unlike many birds elsewhere, not in plumage. The medium tree finch (*Camarhynchus pauper*) is present only on Floreana, whereas the small tree finch (*Camarhynchus parvulus*) and large tree finch (*Camarhynchus psittacula*) also occur together on several other islands. The pattern of distribution and size differences led evolutionary biologist David Lack to suggest[3] that speciation had occurred on Floreana through the invasion of large tree finches from Isabela Island, followed by evolutionary reduction in average size. The resulting medium tree finches did not interbreed with the large tree finches that arrived later, apparently from Santa Cruz Island.

Kleindorfer and colleagues now report that this pattern no longer exists: the large tree finch