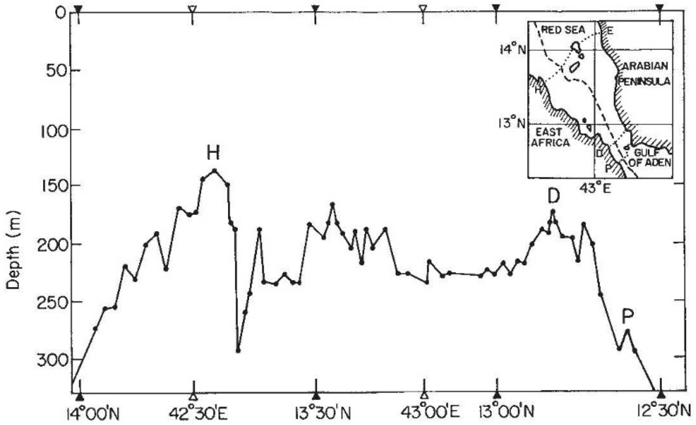

Bottom depth of the southern Red Sea between the Gulf of Aden and 14° N, at 60 selected points along the main trough (dashed line in insert). H denotes the Hanish sill, D denotes the Dumeira sill, and P the Perim sill. The total distance between the two main sills H and D is 125 km. Full triangles on the upper and lower framelines indicate latitude lines crossing the main trough, and open triangles indicate longitude lines crossing the main trough. Insert: a map of the southern Red Sea showing the location of the main trough (dashed line), and three sill cross-sections (dotted lines).

control of the flow. At a level drop of 120 m, their estimated sill depth of $D=$ 60 m fits the geometry of the Dumeira sill, but the relevant width and depth are those for the Hanish sill, $W \approx 7$ km and $D \approx$ 30 m respectively.

For a 120-m sea-level drop, therefore, and retaining their values of evaporation rate and strait length (Q and L, respectively, in their notation) and their assumption that bottom topography was the same as that at present, application of their equation (4) would yield a supersaturation salinity ratio $R=0.1$, rather than the moderate value of $R=0.75$ proposed by Thunell *et al.* Therefore, their conclusion that there is a good agreement between the two independent methods is not valid.

In regard to their estimates for a 150 m level drop, the Hanish sill would in this case be totally exposed, and so the Red Sea would cease to be connected to the world's oceans. Sea-strait dynamics considerations would then not be applicable.

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THUNELL REPLIES—Anati maintains that with a sea-level drop of more than −70 m, flow through the Bab-el-Mandeb strait would be controlled by the Hanish sill rather than the Dumeira sill. He concludes that the Red Sea would have been supersaturated during the last glacial if sea level was lowered by −120 m, and thus that the isotopically derived palaeo-salinities of Thunell *et al.*[1] would not agree with those predicted from the mixing model[2].

As pointed out by Thunell *et al.*[1], estimates for the magnitude of the sea-level lowering during the last glacial range from −80 to −150 m (ref 4). For a sea-level drop of −80 m, the width and depth of the Hanish sill would be approximately 7 km and 70 m, respectively. Using the glacial evaporation rate and strait-length values reported by Thunell et al.[1], a salinity ratio of $R=0.71$ is estimated for an −80-m sea-level drop. This salinity ratio yields a palaeo-salinity estimate of 51.7‰, which is consistent with the isotopically derived palaeo-salinity estimates of 48.6 and 50.1‰ (ref. 1).

Thus, for a sea-level drop of −80 m, there is good agreement between the two independent methods of calculating glacial salinities in the Red Sea. These results may also suggest that the effective sea-level lowering in the Bab-el-Mandeb strait region during the last glacial was closer to −80 m than to −120 m.

Note added in proof: Assaf[5] also used a glacial sea-level lowering of −80m in the overmixing model[3] to examine water exchange through the Bab-el-Mandeb strait.

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Cowbird song

SIR—West and King[1] claim that a wing-stroke display given by captive female brown-headed cowbirds (*Molothrus ater*), in apparent response to 1.1% of male songs, influences male song development. To confirm that an individual responds to a signal, it is necessary to manipulate the proposed signal. Instead of manipulating the female wing stroke directly, West and King found that the seven songs following wing-stroke songs were very potent in eliciting copulatory postures when played later to females, a result they assume to demonstrate that males "immediately" increase the potency of songs in response to wing strokes. But these results would also have been obtained had males ignored female behaviour and simply clustered their potent songs in time. West and King state that males also respond to wing strokes by approaching and inspecting females but present no data other than pictures of one event.

Other explanations for their observations are that males approach females after potent songs irrespective of the female's behaviour; or that the putative female feedback system is an artefact of captivity. Confining birds for long periods may attune them to the behaviour of cage mates to a greater extent than would be the case for conspecifics in nature. Furthermore, West and King isolated most males from others for six months or more[1-3]. Males in nature occur together throughout the year, and male–male interactions influence song development[4]. The unnatural deprivation may have made them abnormally receptive to female behaviour. Another artefact relates to the vocal behaviour of captive cowbirds. As well as the 'perched song' considered by West and King, wild cowbirds give an acoustically distinct song, the 'flight whistle'[5], which is not often sung by caged birds. This is probably because it is usually used for long-distance communication except when the male is close to a female immediately before copulation[5]. West and King[1] say that the perched song is ". . .a defining feature of the release of the copulatory posture", but about half of the observed copulations in nature, including six involving the sub-species studied by West and King, were not preceded by perched songs[5]. Also, in contrast to the 1:1 sex ratio used by West and King, males in nature outnumber females by at least 1.5:1 (ref. 6). Given this excess of males, a female might find one whose song already conforms to her preference rather than tutor one whose song does not.

West and King suggest that the female guidance occurs during winter and spring[2,3]. Cowbirds often winter in large flocks, migrate long distances and show extensive mixing of different breeding populations[7]. It is unclear why a male would alter his singing to suit a female with whom he is unlikely to associate during the height of the breeding season. Calling the wing stroke a display, as West and King do, is premature; a display is a behaviour that evolves because it transmits information beneficial to the sender[8]. We see no clear adaptive reason for a female to tutor a male, particularly because the only demonstrated effects of female 'guidance' involve captive males stressing perched songs typical of the females' subspecies rather than their own[2,3]. Yet West and King have previously suggested that these subspecific song differences function in reproductive isolation[9].

Finally, West and King may overstate the novelty of their findings. Males develop a range of perched songs without female influence[2]. If female wing strokes in response to certain songs are a precursor of the copulatory posture[1] (given perhaps as a reflex), males could simply