

these two transcription factors together are critical is open to question, because developmental distortions preceding muscle differentiation could have occurred.

If a function persists in the absence of a protein could one not conclude that, at the very least, the function can be performed without that protein? Yes, but given that many of the proteins being studied have isoforms or exist in a superfamily with shared motifs, the conclusion is meaningless if these isoforms take over that function. Null mutants are valuable models for study by developmental biologists interested in compensatory gene control mechanisms early in embryogenesis.

Because an enormous expenditure of time and research funds has been invested in the null-mutant strategy, it is important that constructive directions emerge from this technique. Perhaps the concerns raised here can be addressed by activatable promoters and region-specific knock-outs. Implementation of other approaches such as those exploiting anti-sense techniques⁹, which avoid developmental issues but are not without their own problems, may be of potential use. Whatever the strategy selected, it must take into account that the organism does not passively receive the experimenter's manipulation.

I think that the question of the necessity of a gene product cannot be answered with the null-mutant preparation. Because of the accelerating rate in which these mutations are being carried out I am worried that the study of the molecular basis for information storage is being led into a technological cul-de-sac, as the data generated are essentially uninterpretable.

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Distinguishing truth from lies

SIR — In the report of the 'Megalab Truth Test' (*Nature* 373, 391; 1995), R. Wiseman concedes that "it was not possible randomly to allocate individuals to the three conditions" of receiving information via television, radio or newspaper. Indeed, anyone having a slight acquaintance with British society and media would expect the populations tapped by BBC1 television, Radio One, and *The Daily Telegraph* to differ systematically in their distribution of age, education, social class, degree of cultural commonality with Sir Robin Day and, quite possibly, sex. Those responding to the question must have been self-selected within each audience by further criteria (which led, for instance, to

a much smaller percentage response from the radio audience than from the other two groups). Given that no attempt was apparently made, either in the experimental design or in the analysis, to control for these variations, it would be rash indeed to draw any conclusions about the role of verbal, vocal and visual cues in lie detection.

The Megalab was intended to increase public understanding of science. In the kind of social and behavioural science exemplified by this study, the public need little stimulus to understand the interest of the questions. However, the broader public, students in these subjects, and even some of *Nature's* readership in the other sciences, need a great deal of education about the problems, pitfalls and possibilities in reaching scientific conclusions from statistical information. It is a pity that the unique opportunity provided by Megalab was used to offer an example of a social psychological experiment in which these problems were not seriously confronted.

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Wing shape in pterosaurs

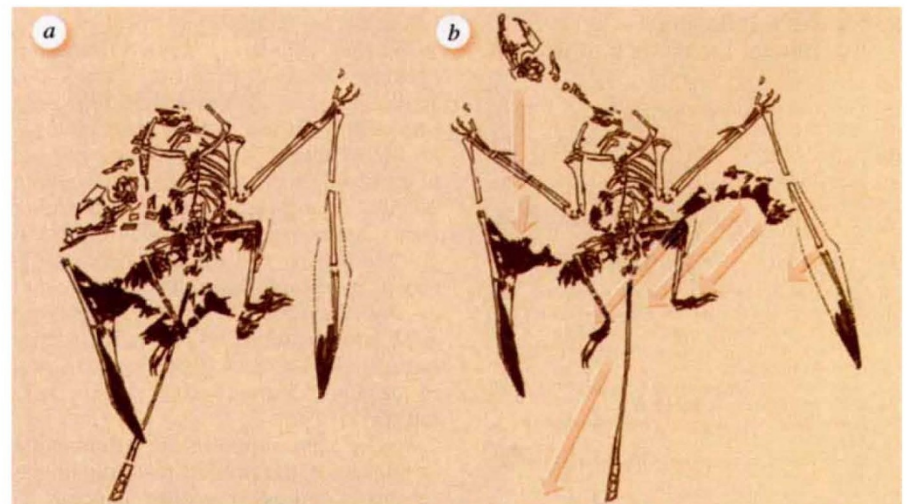
SIR — No consensus has yet been reached on the shape of the wing membrane in pterosaurs. A specimen (PINM 2585/3) of the middle Asian pterosaur *Sordes*^{1,2} seems to present compelling evidence for a broad bat-like wing membrane attached laterally as far as the ankle, and for a medial membrane spanning the hindlimbs and lateral digits. Reconstructions of the membranes using pen and ink¹ or half-tone screens² imply homogeneity and continuity up to the hindlimbs, but in my view

the published photographs do not support those implications.

Large comet-tail smears of tissue near the ankles and feet (*a* in the figure) are clues that parts of the decaying carcass have drifted from their original positions. The tail was 'weathervaned' in the same direction as the comet-tails, and the left forelimb and head had also moved in the same direction. Although not immediately apparent, the left forelimb, partly hidden beneath the skull, had also drifted back in the same direction. The specimen thus exhibits more post-mortem disturbance than the best Solnhofen specimens (refs 3, 4; in contrast to ref. 2), but it apparently preserved hairs better. There is no evidence of bottom currents in the prehistoric lake in which the remains were found^{5,6}, but the fall of the specimen from the lake's surface and its impact on the bottom could account for these disturbances.

I have created a reconstruction (*b*, from a published colour photograph⁷), pushing elements back to their original symmetrical positions. Missing parts of the left wing were mirror-imaged from the right side. Despite the replacement of the missing wing phalanx, symmetry was preserved only when the trailing edge of the left wing shifted forward to the knee area. In doing so it no longer terminated at the ankle as reported^{1,2}. The smears were moved, along with the median membrane, to their apparent points of origin. I placed these on the wing because the thighs were apparently well preserved and complete.

Further evidence that the medium membrane was originally part of the wing comes from the observation that the 63° angle present in the trailing edge of the "uropatagium" almost matches the 65° angle present in the trailing edge of the left wing. In both wing tips, strong parallel fibres preserve a non-extensible feather-like shape. The middle, extensible portion of the left wing is apparently ragged and falling apart. Perhaps in the right wing the



a, Tracing of *Sordes pilosus* (PINM 2585/3) (from ref. 7). *b*, The same specimen partly reconstructed. Arrows indicate probable direction of drifting elements.