36. Tanenbaum, M. and McCord, C.D., The lacrimal drainage system; in: Tasman and Jaeger, Ref. 17, vol. 4, ch. 13.

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38. The tears form a meniscus along the margin of each eyelid and flow from the outer angle of the eye towards the inner angle where a small pool of tears (the *lacus lacrimalis*) gathers. The *punctum* (orifice) of each canaliculus dips into this 'lake'. During lid closure the two puncta 'kiss' and prevent regurgitation of tears as the canaliculi are compressed. When the lids separate the puncta 'pop' apart and suck tears out of the lake.

39. In passing we may note that, contrary to the assertions of evolutionists, the *plica semilunaris* (Latin: *plica,* a pleat or fold) is not a vestigial functionless curiosity, a relic of the nictitating membrane found in animals. Its purpose is to enable unrestricted mobility for the eyeball when abducted (turned outwards). The conjunctiva is the surface membrane lining the eyelids and covering the anterior part of the sclera; to allow the eyeball and lids to move independently it forms a continuous pouch or *sac* above, laterally and below. But medially, because of the presence of the lacrimal drainage apparatus, there is no conjunctival sac; instead there is the plica semilunaris which is a crescentic fold of conjunctiva. It arises in the upper fornix towards its medial end, extends downward, concentric with the limbus, to end in the medial third of the lower fornix. When the eye is abducted the plica partially unfolds as the conjunctiva stretches so that movement is unimpeded. When the eye is adducted (turned inwards) a fibrous extension from the sheath of the muscle contracting (the medial rectus) draws the plica posteriorly, partially unfolding it and deepening the lacus lacrimalis. See Records, R.E., The conjunctiva; in: Tasman and Jaeger, Ref. 17, vol. 2, ch. 2.

40. Records, R.E., The tear film; in: Tasman and Jaeger, Ref. 17, vol. 2, ch. 3.

41. Bron, A.J., The Doyne Lecture, Reflections on the Tears, *Eye* **11**:583–602, 1997.

42. A number of small accessory or supplementary lacrimal glands, also under nervous control, are also present in the upper and lower fornices of the conjunctiva.

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44. Weeping for emotional reasons only occurs in humans.

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## Intricate design

In the operation of an aircraft, different mechanical functions are carried out by different subsystems, often recognizably distinct from one another. Even without a cockpit or a pilot, the same is also true in cells; the difference is that the subsystems are interconnected in ways that are poorly understood at present. But already it is clear that most cellular subsystems are exceedingly intricate. And there is a very large number of them. DNA has to be replicated (at cell division), monitored and repaired when necessary, stretches of DNA must be transcribed into their equivalents of RNA, food or sunlight must be converted into energy, the internal skeleton must be maintained (and then modified if the cell is capable of movement).

John Maddox
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