# Hooke's housefly

**The invention of the microscope opened up a new world of scientific discovery. It also presented perceptual and philosophical challenges — which were brought into sharp focus by the seminal work of Robert Hooke.**

**Martin Kemp**

Every act of looking is an act of active interpretation. In our normal visual territories we unconsciously perform countless such acts each day without major problem. When we are confronted with unknown sights in visual landscapes of which we have no prior experience, the complex interaction between seeing and knowing becomes openly problematic. The arts of microscopic and telescopic observation present challenges to our perceptual abilities.

The perceptual issues and philosophical implications of microscopy are encapsulated in its first all-round masterpiece, Robert Hooke's *Micrographia*, published in London in 1665. Working in the context of the newly founded Royal Society, Hooke was commissioned to complete the project of microscopical observation and representation begun for King Charles II by Sir Christopher Wren, mathematician and architect.

**Hooke was dedicated above all to "plainness and soundness of Observation". But, as he well knew, observing and representing are complex businesses, above all with the "adding of artificial Organs to the natural", as is the case with both microscopes and telescopes. The crucial problem is the "disproportion of the Object to the Organ" — whether the object is too big for the eye or too small, too close or too far away.**

The key was to be able to translate the seen patterns of lights and darks into a coherent, three-dimensional image with reference to known forms. Hooke describes how "I have endeavoured.... first to discover the true appearance.... I never began to make a draught before by many examinations in several lights, and in several positions to these lights, I had discover'd the true form. For it is exceeding difficult in some Objects to distinguish between a prominency and a depression, between a shadow and a black stain, or a reflection and a whiteness in the colour."

As an example of the perceptual problems, he cites the eye of a fly, which was the subject of one of his most stunning plates: "The Eye of a Fly in one kind of light appears almost like a lattice, drill'd through with abundance of small holes... In the Sunshine they look like a surface cover'd with golden Nails; in another posture, like a surface cover'd with pyramids; in another with Cones; and in other postures of quite other shapes."

His text relies repeatedly on the use of analogies with the world of familiar objects. This use of resemblance serves to underline the ever more minute microcosmic affinities that microscopy was disclosing. As he wrote, "Little Objects are to be compar'd to the greater and more beautiful Works of Nature, A Flea, a Mite, a Gnat, to a Horse, an Elephant, or a Lyon". The flea, as a miracle of micro-engineering, is "adorn'd with a curiously polish'd suit of sable Armour, neatly pointed, and beset with multitudes of sharp pins, shap'd almost like Porcupine's Quills, or bright conical Steel-bodkins".

Throughout the *Micrographia*, the beautiful mechanics and geometry of the smallest microcosms are made manifest, courtesy of Hooke's intelligent eye and elegant hand. □

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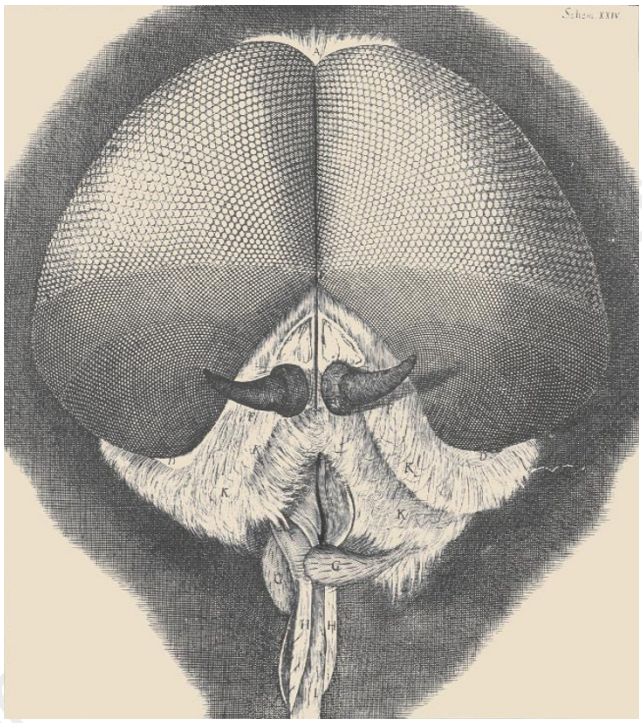
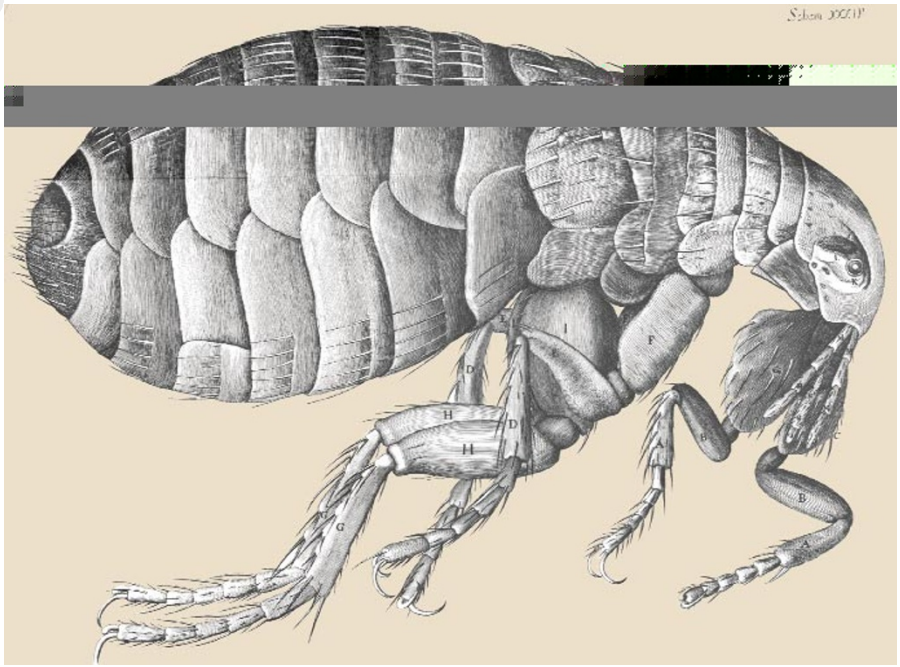


Hooke's "Eye of a Fly", from *Micrographia*, 1665.



Hooke's "Flea", from *Micrographia*, 1665.