

MICROGRAPHIA:

OR SOME

Physiological Descriptions

OF

MINUTE BODIES

MADE BY

MAGNIFYING GLASSES

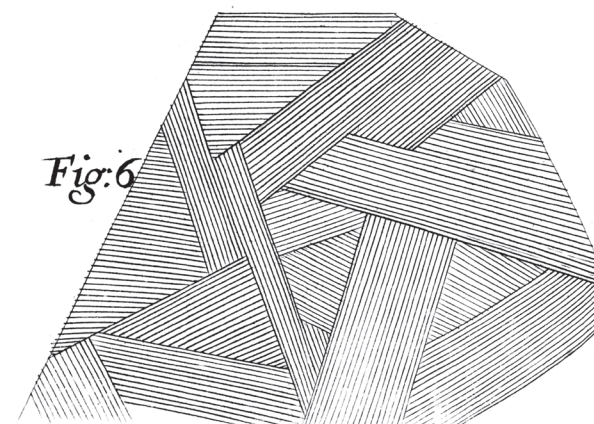
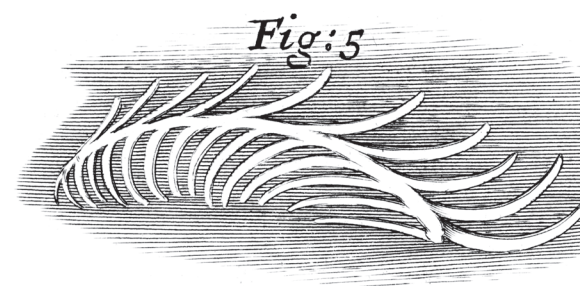
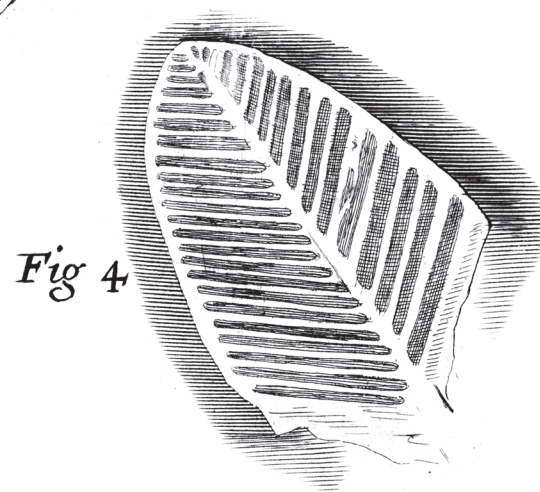
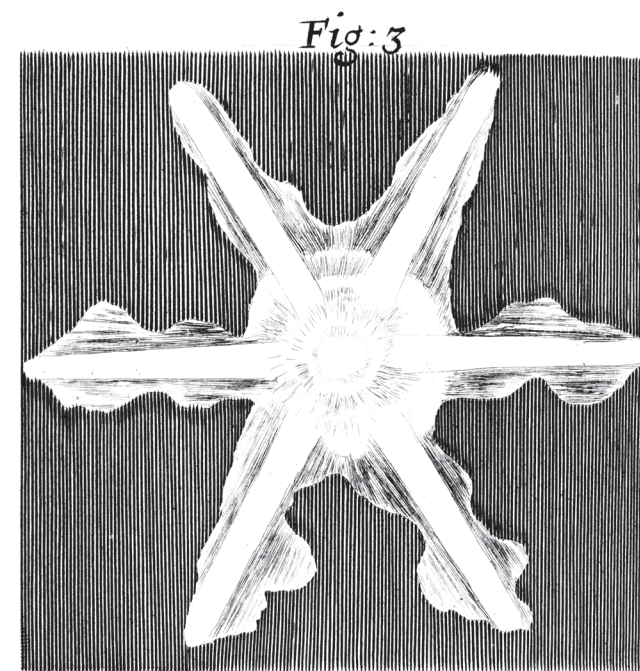
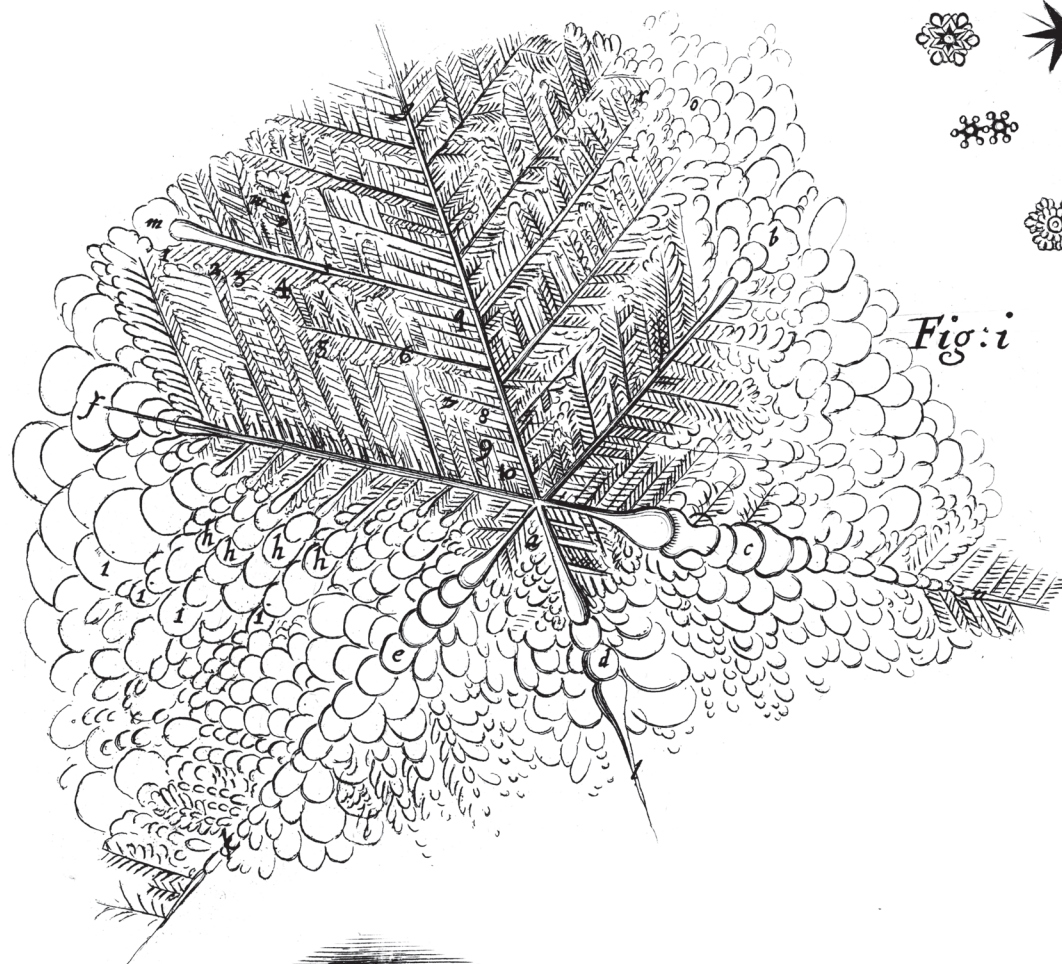
WITH

OBSERVATIONS and INQUIRIES thereupon.

By *R. HOOKE*, Fellow of the ROYAL SOCIETY

Snowflakes, ice and urine crystals

In *Micrographia* Robert Hooke presented his microscope subjects in a hierarchy of increasing complexity – from crystals, salts and minerals to fungi, plants and animals among others. Here Hooke recorded and compared structures which he observed in snowflakes (figures 2 and 3), ice (figures 4–6) and frozen urine (figure i). He noted that despite their ‘infinite variety’ in shape and size, snowflakes were nevertheless always hexagonally symmetrical. Ever curious, Hooke even tasted some frozen urine – exactly whose he did not specify – finding it ‘as insipid as water’.



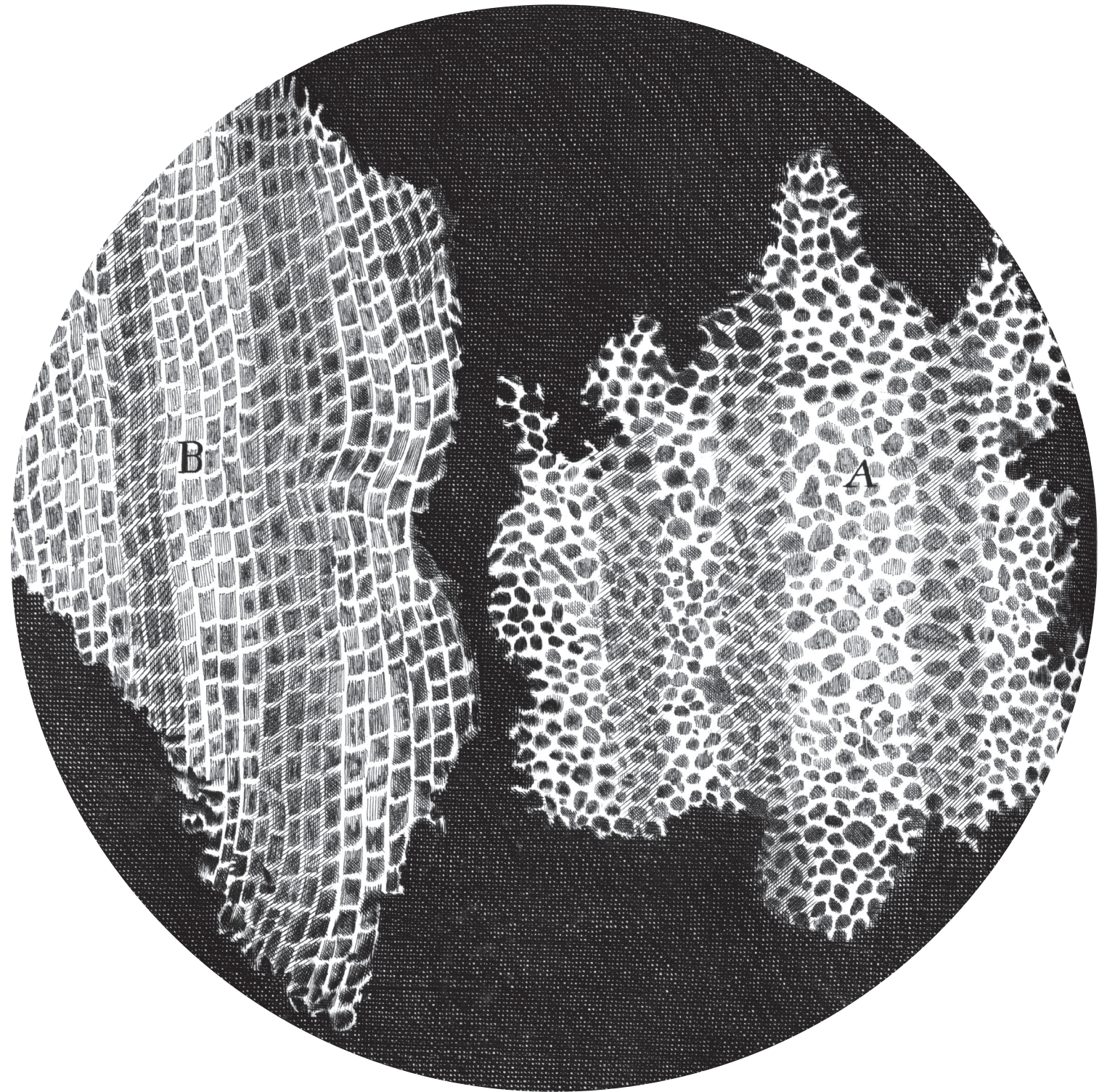
The 'curious texture' of Kettering-stone

This magnified view shows a stone sample from Kettering, Northamptonshire. It appeared smooth to the naked eye, but the microscope revealed a porous, globular structure which Hooke likened variously to herring roe, eggs and pebbles. He confirmed his observations about the stone's porousness by moistening the surface with saliva, then blowing into one end to form air bubbles at the other.



The 'texture' of cork

Examining slices of cork on a black plate with his microscope, Hooke was reminded of honeycomb. Counting the average number of 'pores' or 'cells' in a given length, he deduced that a cubic inch must contain 'above twelve hundred Millions'. This was almost inconceivable, he argued, had he not visual proof. Hooke reasoned that these abundant pockets trapped air, helping to explain cork's buoyancy, lightness and springiness.



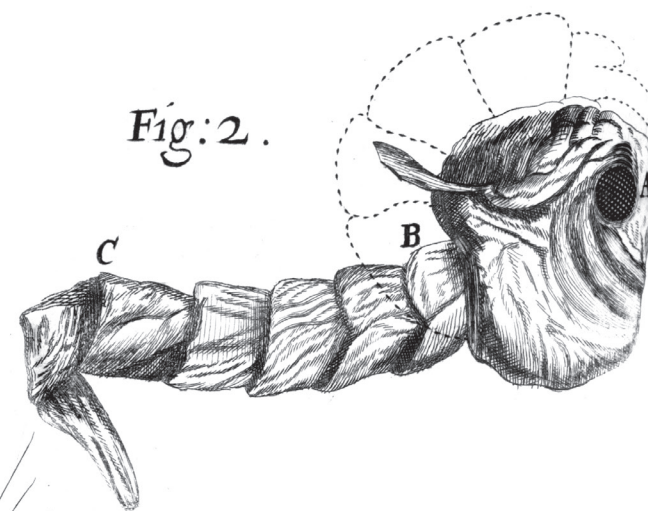
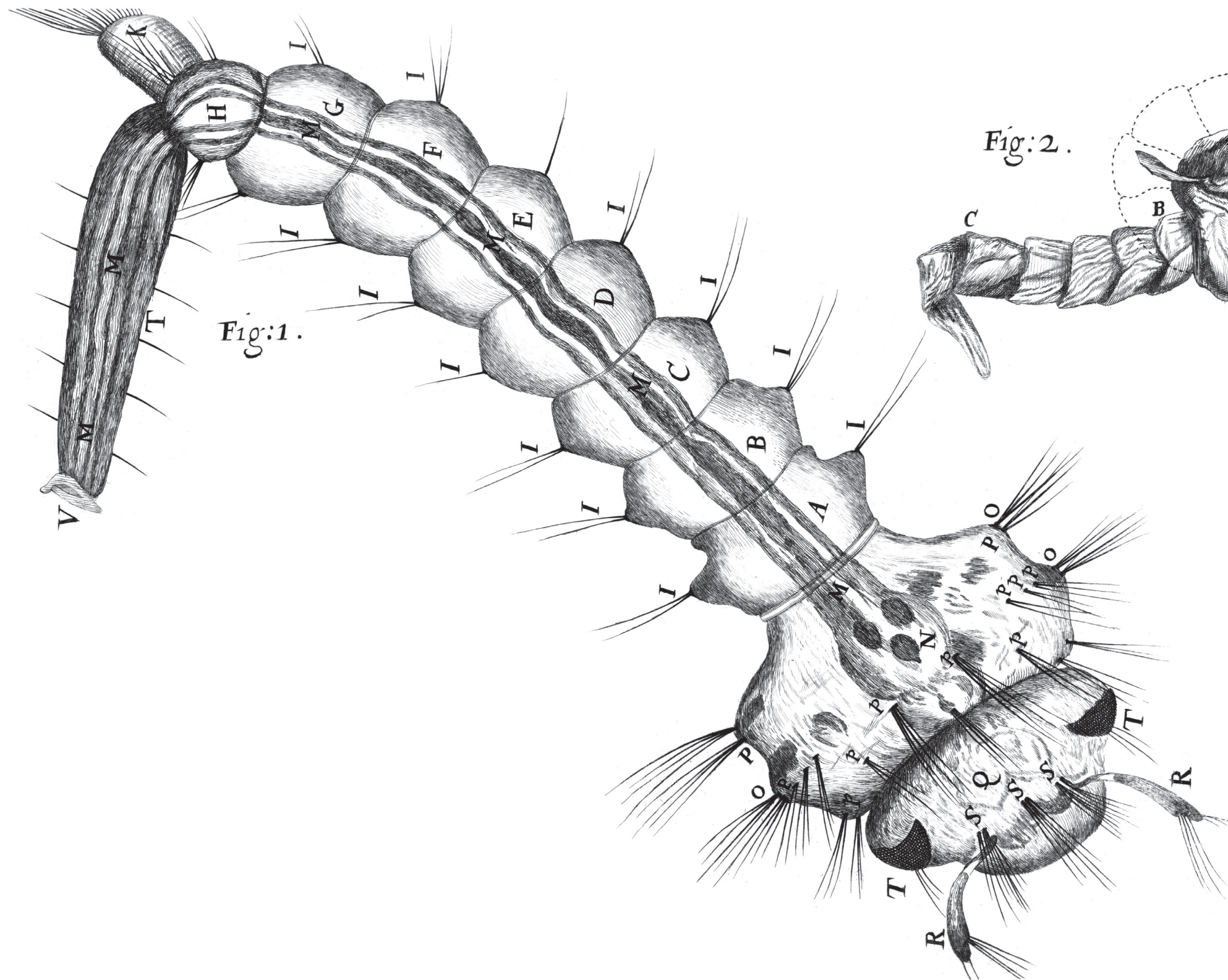
A 'small white spot of hairy mould'

What looks like a surreal landscape is actually a microscopic view of mould which Hooke found growing on a book. Not content merely to observe the mould, he also tested its flammability, and described both its smell and taste as 'unpleasant and noisome'. Hooke concluded that 'these pretty bodies' were a kind of mushroom, but struggled to explain how they formed and grew.



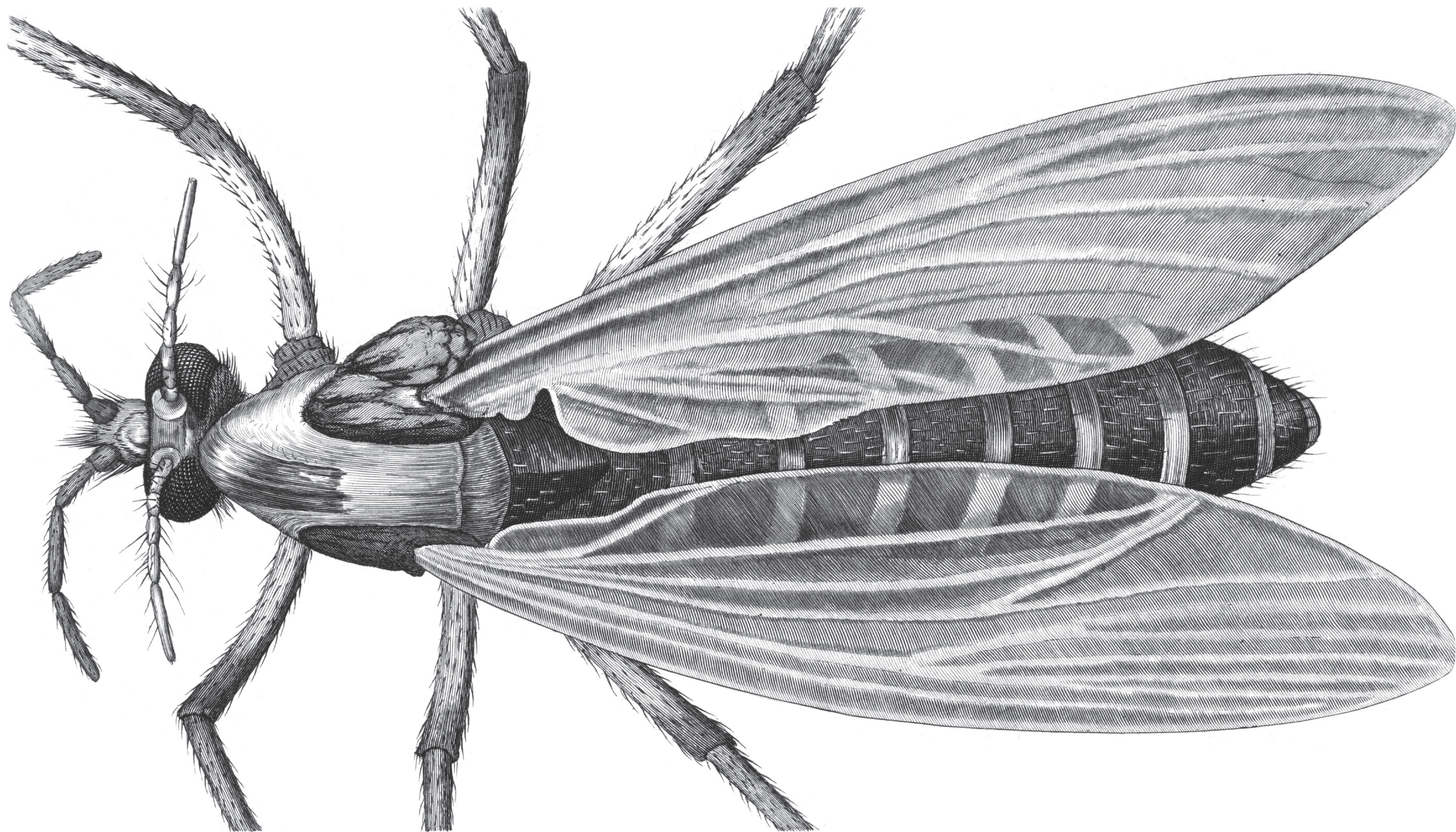
The early life stages of gnats

Hooke carefully observed the life cycle of gnats, recording the transformation from larva (figure 1) to pupa (figure 2) to 'perfect Gnat' (overleaf). Examining live, transparent larvae through his microscope, he described their 'strange, and pleasant' movement and the pumping motions of their guts and hearts. Hooke consequently argued that, unlike the practice of 'dissecting and mangling' live creatures, microscopes could reveal nature's workings 'undisturbed'.



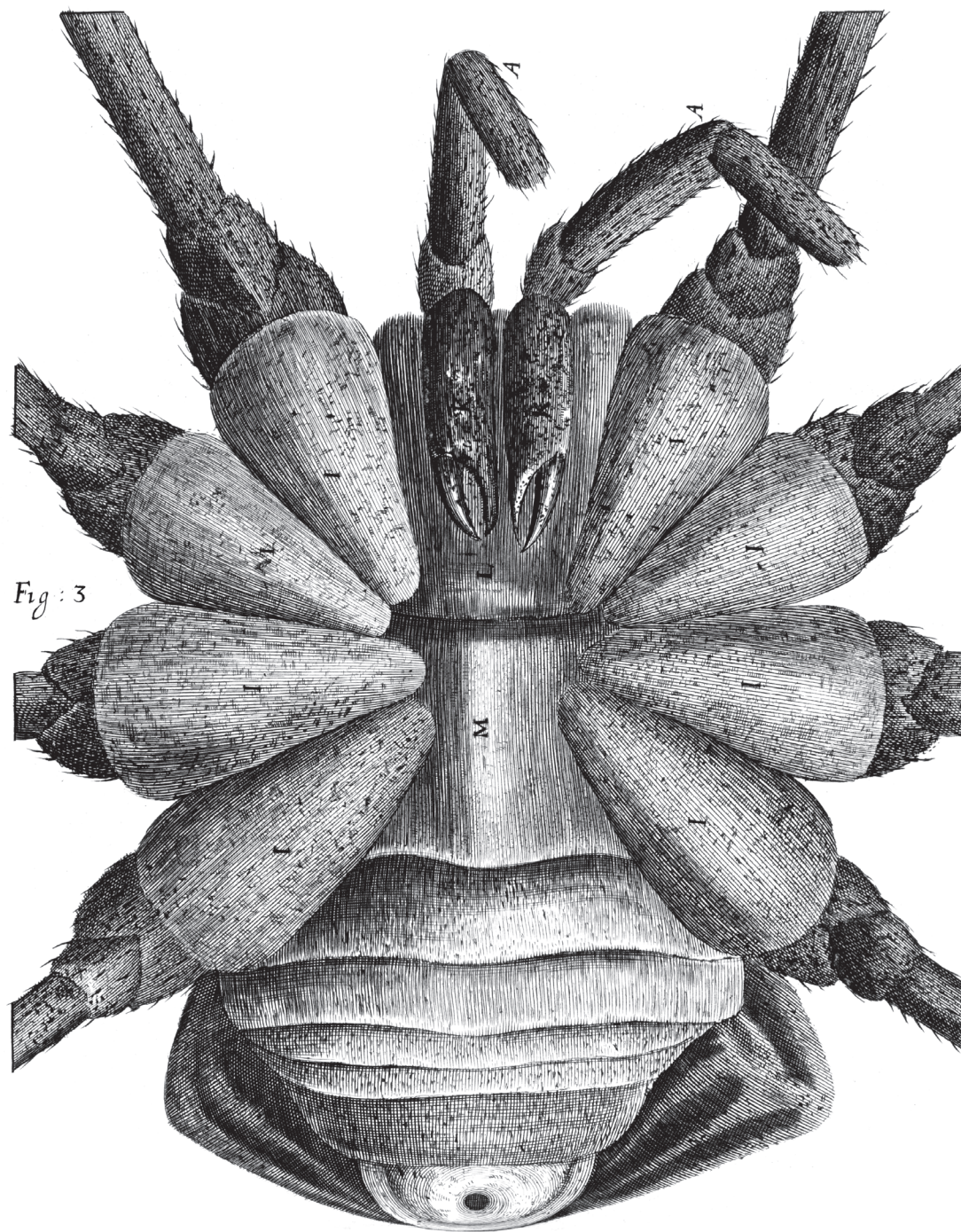
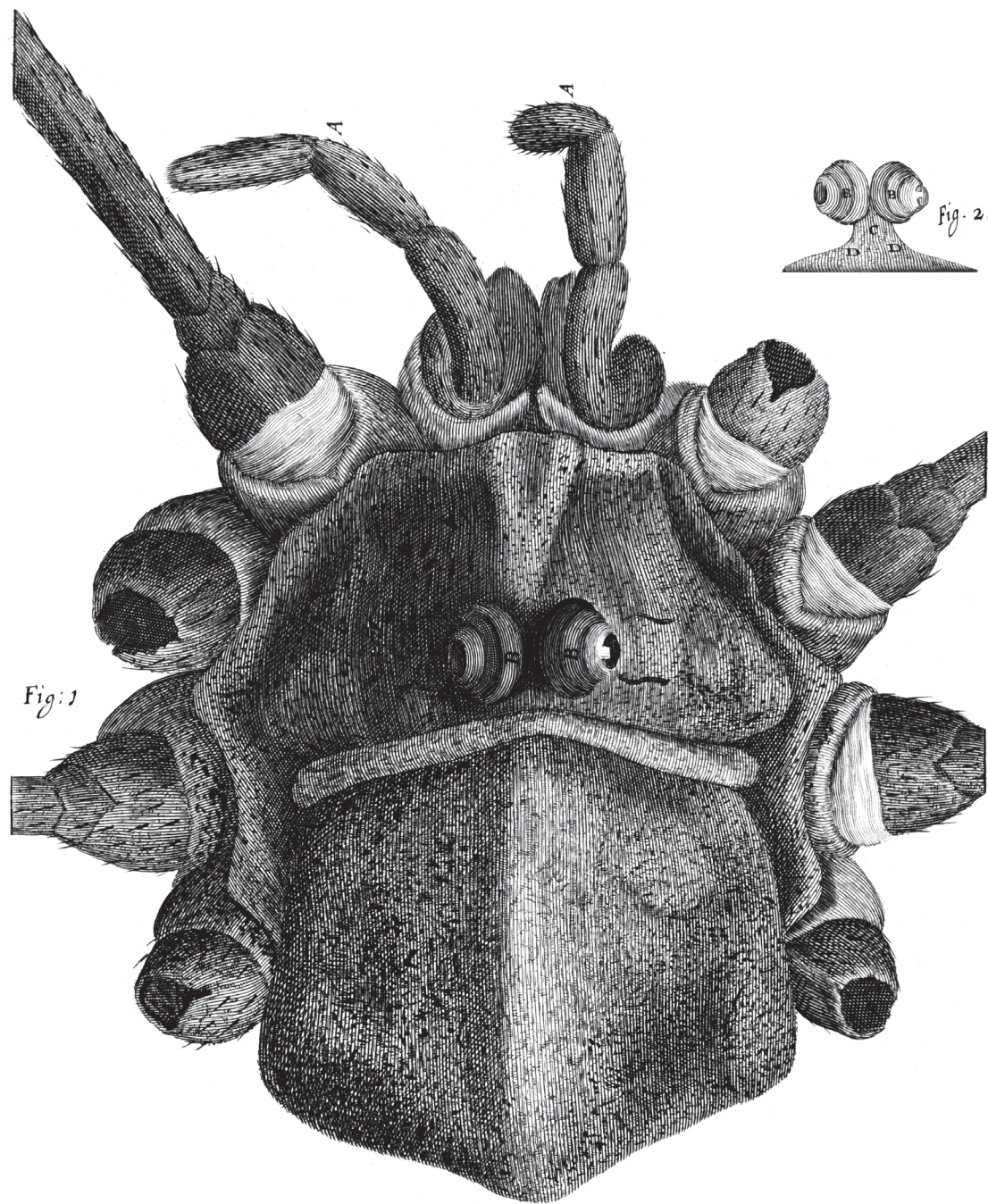
The female gnat

Hooke identified this gnat as female partly because of its large wings and the particular shape of its belly. He examined one gnat drawing blood from his hand until its belly was full, 'making it appear very red and transparent'. Hooke argued that because he felt no pain, gnats did this out of 'necessity, and to satisfy their hunger', rather than 'out of enmity and revenge'.



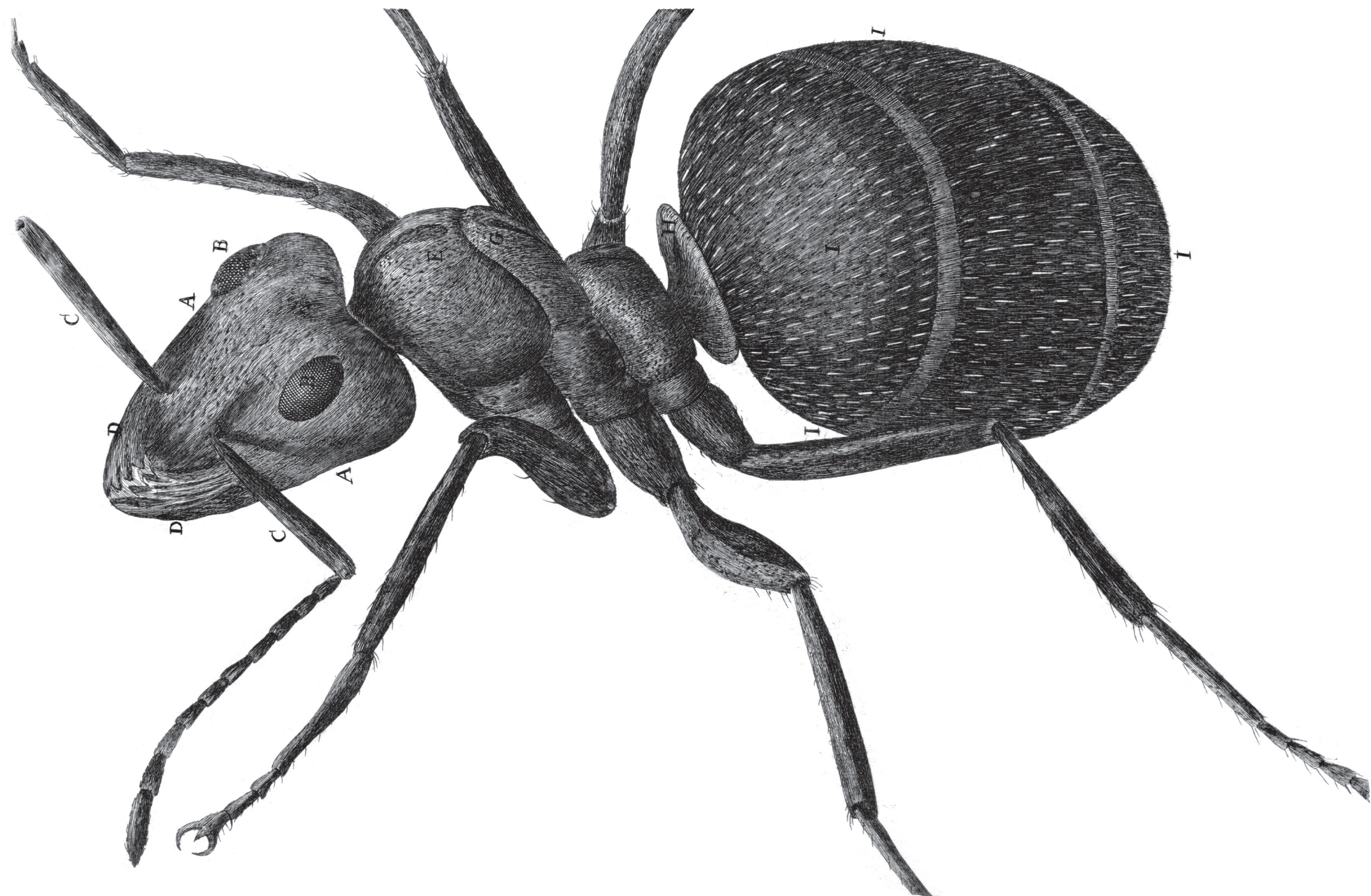
The shepherd spider

According to Hooke, microscopes of the day would 'magnifie an Object about a thousand thousand times', uncovering otherwise invisible detail. His own microscope revealed a peculiarity about the shepherd or harvestman spider, seen here from above and below. Unusually among spiders, it only had two eyes (figure 2). Hooke was equally intrigued by the 'prodigious length' of its legs, each more than 16 times longer than its body.



The 'troublesom' ant

Hooke found ants the most frustrating animals to draw. Dipped in wax or glue, they writhed about distractingly. If killed, they immediately shrivelled up. He eventually immersed an ant in brandy and 'knock'd him down dead drunk'. Even this proved insufficient, though, as after drying out the ant 'suddenly reviv'd and ran away'. Repeating the process over many hours still failed to tame the feisty insect.



'Kinds of crustaceous creatures'

Clockwise from figure 3 are shown a 'Silver-colour'd Book-worm' or silverfish, a 'wandering Mite' and what Hooke described as a 'Crab-like Insect' he had once seen. Recording their behaviour and external anatomy in detail, Hooke proposed that studying such creatures further would enhance human admiration for nature's 'contrivance and workmanship', as well as for 'the infinite wisdom and providence of the Creator'.

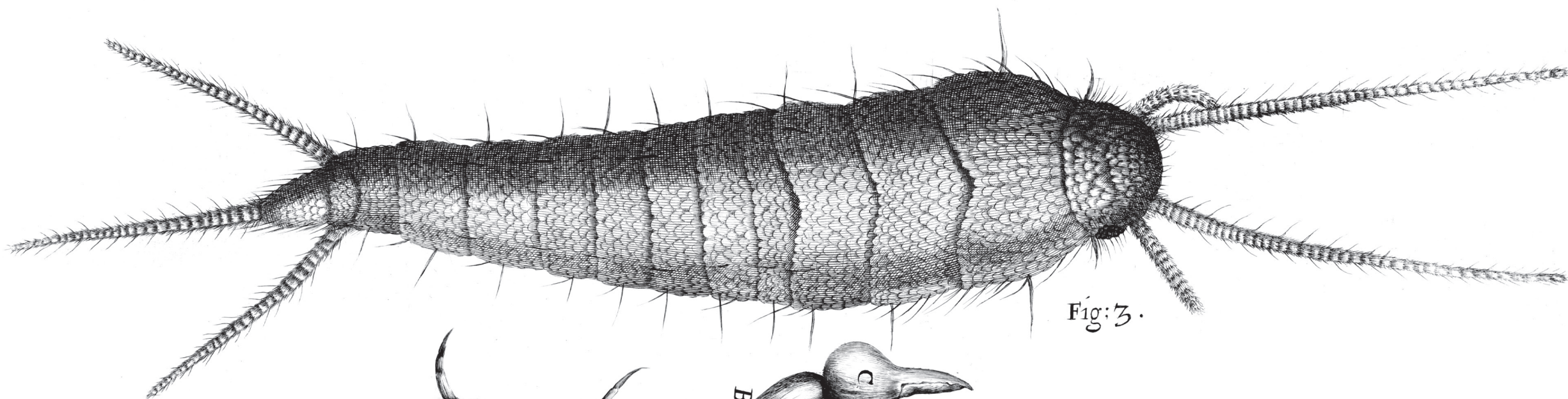


Fig: 3.

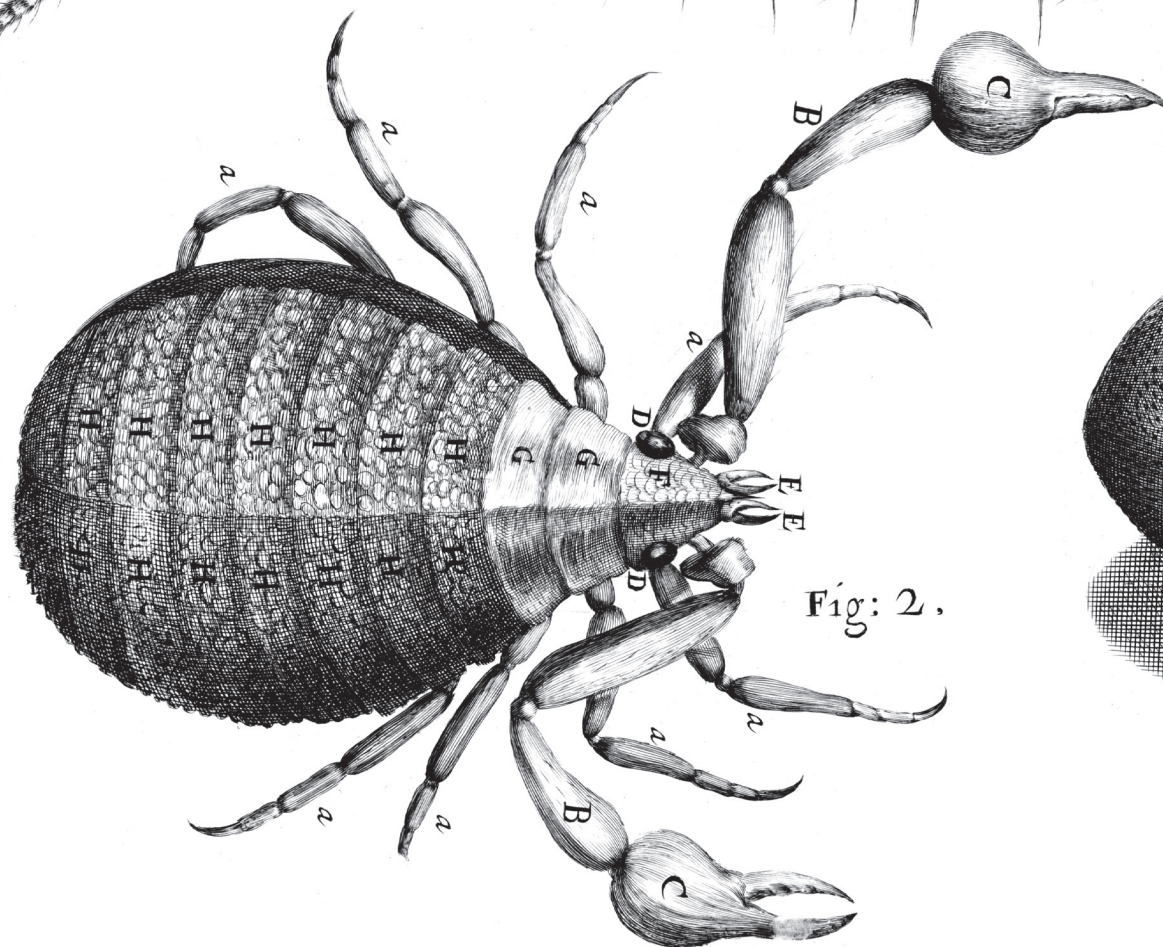


Fig: 2.

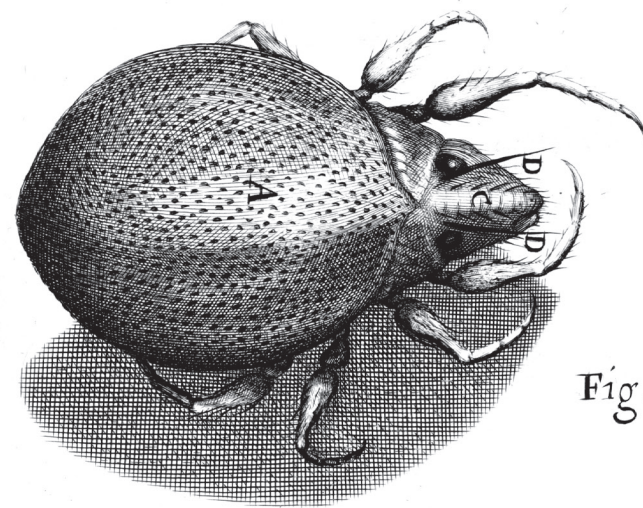
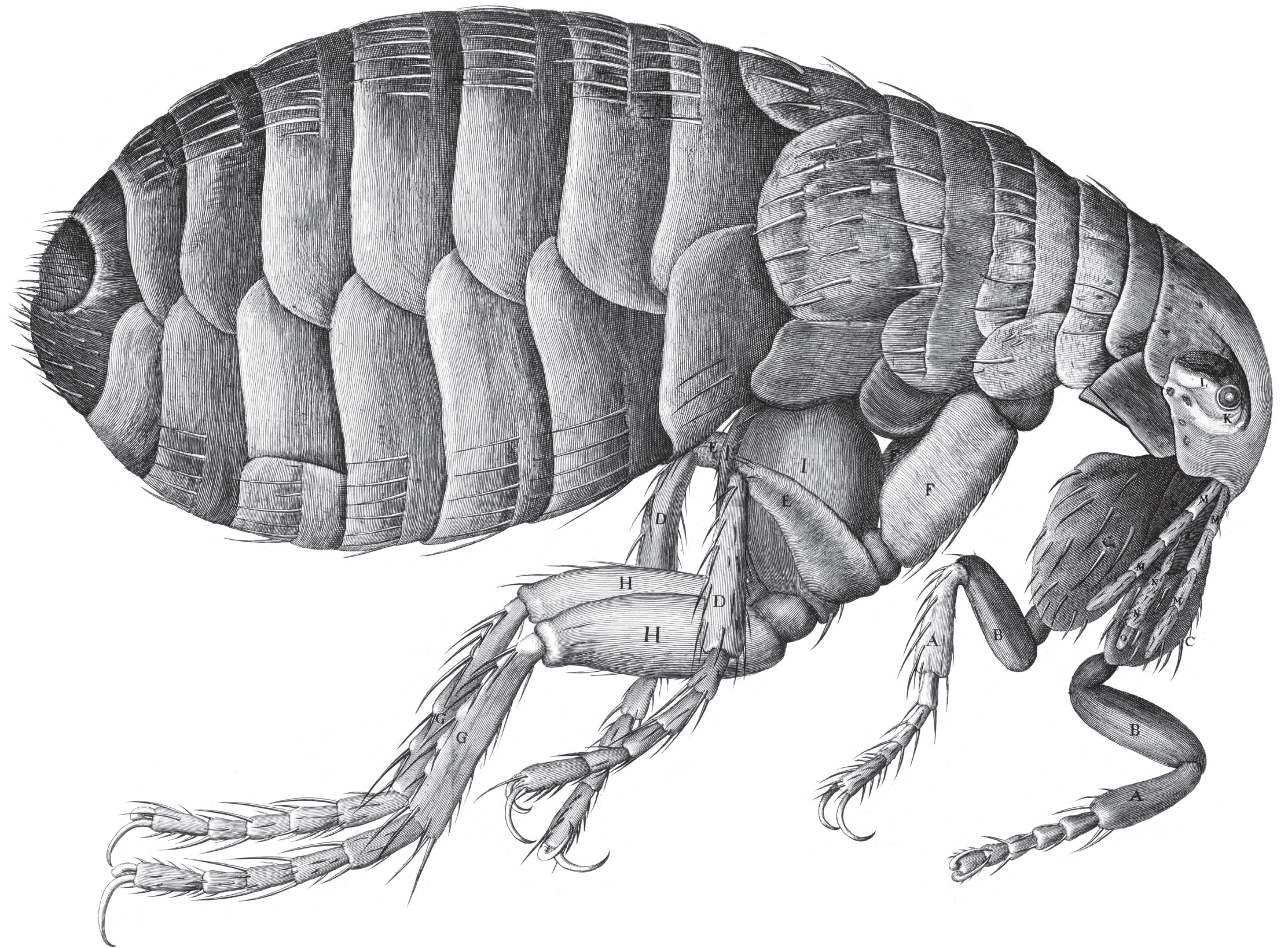


Fig: 1.

The flea

Hooke marvelled at both the 'strength and beauty' of the flea. He described how it could fold its leg joints 'and suddenly stretch, or spring them out to their whole length' in order to leap. He likened its shell to a suit of armour, but left 'more obvious' features unsaid, referring the reader instead to his picture. Hooke strongly believed in the power of visual communication.



The bloodthirsty louse

The branch in this louse's grasp is actually a human hair. Personal hygiene was clearly an issue in Hooke's day, since he portrayed lice as universally familiar pests. Despite his disdain, Hooke let this 'officious', 'impudent', 'greedy' creature draw blood from his hand in his desire to observe and record animal behaviour. He watched his blood 'be variously distributed, and mov'd to and fro' in its transparent thorax.

