

CLASSICS OF SCIENCE:

The Ant or Pismire

Biology

A low-power microscope or a good hand lens will open a new world to you as the first microscope in England did to Hooke nearly three centuries ago. The first Classic of Science, published in the *SCIENCE NEWS-LETTER* September 17, 1927, gave Hooke's description of cells in cork. This week's Classic gives another of his charming accounts of the objects he looked at.

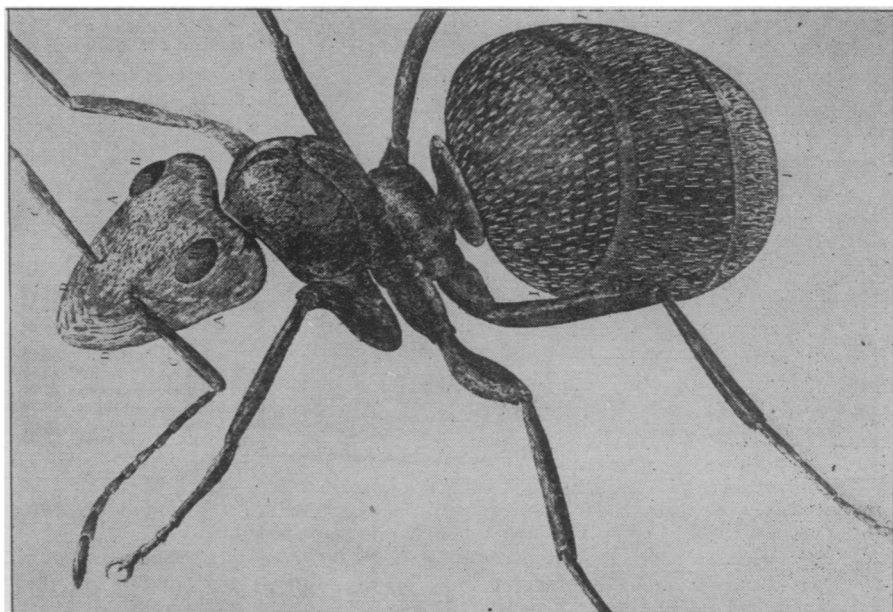
MICROGRAPHIA, by Robert Hooke, London, MDCLXV (1665). *Observ. XLIX. Of an Ant or Pismire.*

Making the Ant Ly Quiet

This was a creature, more troublesome to be drawn, than any of the rest, for I could not, for a good while, think of a way to make it suffer its body to ly quiet in a natural posture; but whil'st it was alive, if its feet were fetter'd in Wax or Glew, it would so twist and wind its body, that I could not any wayes get a good view of it; and if I killed it, its body was so little, that I did often spoil the shape of it, before I could thoroughly view it: for this is the nature of these minute Bodies, that as soon, almost, as ever their life is destroy'd, their parts immediately shrivel, and lose their bauty; and so it is also with small Plants, as I instanced before, in the description of Moss. . . .

So is it also with Animal substances; the dead body of an Ant, or such little creature, does almost instantly shrivel and dry, and your object shall be quite another thing, before you can half delineate it, which proceeds not from the extraordinary exhalation, but from the small proportion of body and juices, to the usual drying of bodies in the Air, especially if warm. For which inconvenience, where I could not otherwise remove it, I thought of this expedient.

I took the creature, I had design'd to delineate, and put it into a drop of very well rectified spirit of Wine, this I found would presently dispatch, as it were, the Animal, and being taken out of it, and lay'd on a paper, the spirit of Wine would immediately fly away, and leave the Animal dry, in its natural posture, or at least, in a constitution, that it might easily with a pin be plac'd, in what posture you desired to draw it, and the limbs would so remain, without either moving, or shriveling. And thus I dealt with this Ant, which I have here delineated, which was one of many, of a very large kind, that inhabited under the Roots of a Tree, from whence they would sally out in great parties, and make most grievous havock of the Flowers and Fruits, in the am-



HOOKE'S DRAWING OF A DRUNKEN ANT

bient Garden, and return back again very expertly, by the same wayes and paths they went.

It was more than half the bigness of an Earwig, of a dark brown, or reddish colour, with long legs, on the hinder of which it would stand up, and raise its head as high as it could above the ground, that it might stare the further about it, just after the same manner as I have also observ'd a hunting Spider to do; and putting my finger towards them, they have at first all run towards it, till almost at it; and then they would stand round about it, at a certain distance, and smell, as it were, and consider whether they should any of them venture any further, till one more bold than the rest, venturing to climb it, all the rest, if I would have suffered them, would have immediately followed: many such other seemingly rational actions I have observ'd in this little Vermine with much pleasure, which would be too long to be here related; those that desire more of them may satisfie their curiosity in *Lignons* History of the *Barbadoes*.

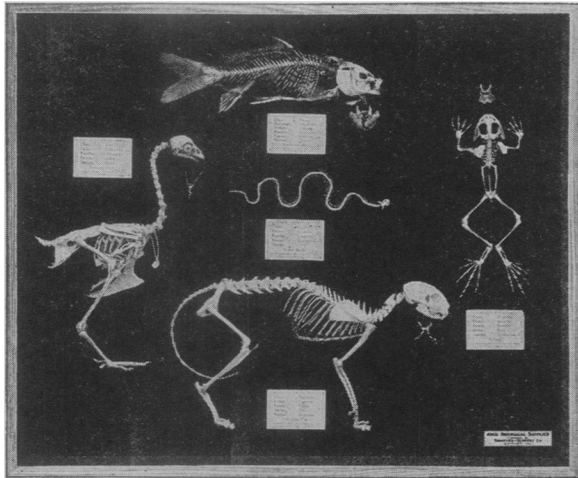
Having insnar'd several of these into a small Box, I made choice of the tallest grown among them, and separating it from the rest, I gave it a Gill of Brandy, or Spirit of Wine, which after a while e'en knock'd him down dead drunk, so that he became moveless, though at first putting in he struggled for a pretty while very

much, till at last, certain bubbles issuing out of its mouth, it ceased to move; this (because I had before found them quickly to recover again, if they were taken out presently) I suffered to lye above an hour in the Spirit; and after I had taken it out, and put its body and legs into a natural posture, remained moveless about an hour; but then, upon a sudden, as if it had been awaken out of a drunken sleep, it suddenly reviv'd and ran away; being caught, and serv'd as before, he for awhile continued struggling and striving, till at last there issued several bubbles out of its mouth, and then, *tanquam animam expirasset*, he remained moveless for a good while; but at length again recovering, it was again redipt, and suffered to lye some hours in the Spirit; notwithstanding which, after it had layen dry some three or four hours, it again recovered life and motion: Which kind of Experiments, if prosecuted, which they highly deserve, seem to me of no inconsiderable use towards the invention of the *Latent Scheme*, (as the Noble *Verulam* calls it) or the hidden, unknown Texture of Bodies.

The Figure of the Ant

Of what Figure this Creature appear'd through the *Microscope*, the 32 *Scheme* (though not so carefully graven as it ought) will represent to the eye, namely, (*Turn to next page*)

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Can Adults Learn?

Psychology—Education

EDWARD L. THORNDIKE in *Adult Learning* (Macmillan):

On the average, at the present time, individuals probably learn much less per year from twenty-five to forty-five than they did from five to twenty-five. The magnitude of the decrease is, however, exaggerated in the common view which represents the child and adolescent as incessantly and actively seeking for new impressions, ideas, and skills, and rapidly absorbing the traditions, manners, and habits of those with whom he is in social contact, and represents the adult as remaining almost *in statu quo*.

Children and adolescents, in fact, spend a very large part of their time in routine performances which are uneducative—in sleep, in dressing and undressing, in eating, in playing the same plays no better than before; in telling what they and others have done and where they have been, without any linguistic improvement; in reading the comic page of the newspaper and stories which are for the most part only temporary stimulations, distractions, and reliefs; in routine acts of helpfulness around the house or farm; and in watching familiar occurrences without any instructive reflections concerning them. The learning of adults is rarely *nil*. At the least, they learn a host of concrete particulars; new names and faces, new items about automobiles, baseball players, movie stars; what "they are wearing" this year, and the like; some new skills as their jobs change and new recreations attract them; and a few general ideas about the war, prohibition, socialism, or religion. At the most, as in the case of the scientific investigator or historical scholar, paid for learning in money or esteem or both, they may learn much more than they did in childhood.

The decrease in learning, which does, on the average, occur, may be explained by various combinations of the four factors, general health and energy, ability to learn, interest in learning, and opportunity. A decline in general health is probably of great significance in respect of the decline of learning at very late ages (say sixty-five to eighty-five), but is of small consequence for changes from the score of years around fifteen to the score around thirty-five.

Science News-Letter, August 4, 1928

There were 42 robberies and hold-ups in London in 1925; whereas in Chicago there were 1,702.

The Ant or Pismire—Continued

That it had a large head AA, at the upper end of which were two protuberant eyes, pearl'd like those of a Fly, but smaller BB; out of the Nose, or foremost part, issued two horns CC, of a shape sufficiently differing from those of a blew Fly, though indeed they seem to be both the same kind of Organ, and to serve for a kind of smelling; beyond these were two indented jaws DD, which he open'd sideways, and was able to gape them asunder very wide; and the ends of them being armed with teeth, which meeting went between each other, it was able to grasp and hold a heavy body, three or four times the bulk and weight of its own body: It had only six legs, shap'd like those of a Fly, which, as I shewed before, is an Argument that it is a winged Insect, and though I could not perceive any sign of them in the middle part of its body (which seem'd to consist of three joints or pieces EFG, out of which sprung two legs, yet 'tis known that there are of them that have long wings, and fly up and down in the air.

The third and last part of its body III was bigger and larger than the other two, unto which it was joyn'd by a very small middle, and had a

kind of loose shell, or another distinct part of its body H, which seem'd to be interpos'd, and to keep the *thorax* and belly from touching.

The whole body was cas'd over with a very strong armour, and the belly III was covered likewise with multitudes of small white shining bristles; the legs, horns, head, and middle parts of its body were bestuck with hairs also, but smaller and darker.

Robert Hooke was born on the Isle of Wight July 18, 1635, and died March 3, 1703, in London. At the age of 18 he entered Oxford. Two years later he was employed by Hon. Robert Boyle whom he helped in his experiments. At the age of 27 he was appointed curator of experiments of the Royal Society. He was prominently identified with that then young scientific body throughout his life. He was interested in all branches of science, but particularly in astronomy, physics, optics and optical instruments. He made a number of discoveries and inventions, many of which were anticipated by other scientists by a short margin of time. These disappointments embittered his later life, and involved him in unhappy controversies. The *Micrographia*, recording his experiences with his home-made microscope, written when he was 30 years old, is a thoroughly delightful volume, fully illustrated with his own drawings of what he saw, ranging from a needle point and a razor blade to all the common insects.

Science News-Letter, August 4, 1928