



DUCKS & DROIDS

Machines created in the image of man that can perform human tasks have long fascinated engineers and writers alike. We begin a series of articles that explore the science of robotics, starting here with a look at past attempts to build such machines, from the mechanical inventions of the 18th century to present day industrial robots.

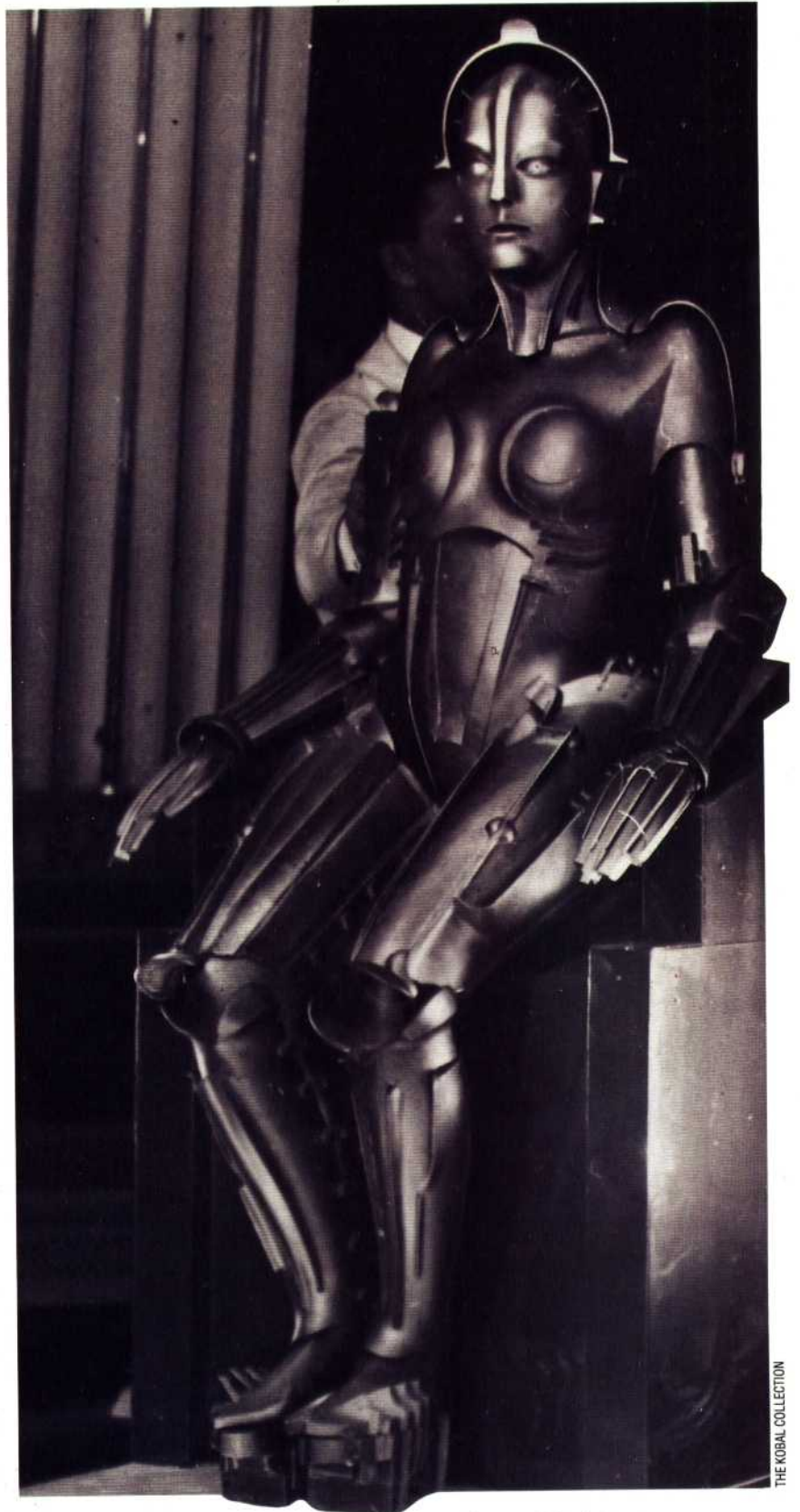
For hundreds of years, many people have been attracted to the idea of mechanical men in one form or another. Philosophers, engineers and inventors have set their minds to creating machines that mimic human behaviour. Although robots are nowadays less likely to look like humans and are designed to perform a specific range of actions, the earliest mechanical men were designed to look as lifelike as possible and suggest that they could be capable of any human action.

The first mechanical robot, however, wasn't given the form of a man. In 1738, Jacques de Vaucanson (1709–1782), a French engineer, presented a mechanical duck to the Académie Royale des Sciences in Paris. The duck was able to flap its wings, quack and eat food. Later in the 18th century, a Swiss inventor, Pierre Jaquet-Droz (1721–1790), created a set of mechanical puppets that could perform a variety of actions. One could write, one was able to draw figures, and another played music on an organ. By the end of the 19th century there were large numbers of such machines in existence, all based on clockwork mechanisms.

In the Victorian era, numerous figures were constructed that were remarkably lifelike, and not all of these were based on clockwork. In 1893, George Moore built a mechanical man that relied on steam power as its motivating force — an interesting side-effect of which was to enable the mechanical man to puff a cigar and appear to exhale smoke.

Newer technologies have stimulated the development of more ambitious machines: from the simple mechanical men constructed out of Meccano sets that are capable of walking across the floor, to the classic 'Elektro' man, built by the American company, Westinghouse. 'Elektro' was a seven foot tall (2.15 metres) mechanical man that could speak up to 80 different words, count, walk, talk, salute and distinguish between different colours. He was powered by no less than 11 electric motors and weighed 117 kgs (260 lbs). Controlling this huge bulk was a 'brain' that consisted of a total of 82 different relays.

But each of these mechanical men had its



THE KOBAL COLLECTION

limitations. None of them, despite their obvious entertainment value, had any of the capabilities you might want when you think of your ideal robot. A mechanical man that can draw figures will not do the shopping for you, and a mechanical man that can walk across the room will be unlikely to get even as far as the shops without walking into

Robot Roots

Fritz Lang's 1926 science fiction classic 'Metropolis' influenced film-makers and audiences for decades, not least in crystallising vague contemporary images of progress and industry in The Machine, the first cinema robot star