furtherance of the science to which they devoted themselves. Tycho was cautious, patient, persevering, and observing: Kepler, ardent in temperament, an enthusiastic theorist, invariably framing hypotheses before he was supplied with the facts on which alone they could be established, started with the vast product of the labours of his master, and made some of the most important discoveries that have been effected in natural science. 'The laws he laid down,' says Sir J. Herschel, 'constitute the most important and beautiful system of geometrical relations which have ever been discovered by a mere inductive process, independent of any consideration of a theoretical kind. They comprise within them a compendium of the motions of all the planets, and enable us to assign their places in their orbits at any instant of time past or to come (disregarding their mutual perturbations), provided certain purely geometrical problems can be numerically resolved.' Still, even Kepler was not freed from those strange and, to us, absurd imaginings which have been advanced at various periods of the world, for the explanation of difficult problems in natural science. In 1619 he published a work in which he affirmed that the earth was a living animal, for that 'when a stone was thrown into the deep clefts of a high mountain, a sound was returned from them; and when it was thrown into one of the mountain lakes, which, without doubt, were bottomless, a storm immediately arose; just as a ticklish animal would shake its head, or run shuddering away, when a straw was thrust into its ear or nose.' This would seem more like the reverie of a disordered imagination, than the sober conclusion of an intelligent and earnest mind. Yet the same work contains a defence of the view that the orbs of heaven are engaged in performing a concert of music, in which Jupiter and Saturn take the bass; Mars, the Earth, and Venus the tenor; and Mercury the treble."

Contemporary with Tycho Brahe was the famous Galileo. He was the son of a Florentine nobleman, and was born and educated at Pisa. At the University of that city he attained, at the early age of twenty-five, the distinguished honour of occupying the mathematical chair.

At the beginning of the seventeenth century Galileo was at Venice. And thither report was brought that a Dutchman had presented to Count Maurice of Nassau an instrument by means of which distant objects were made to appear as if they were near. This was all the rumour; but Galileo heard in it the revelation of the Telescope. How could distant objects be brought apparently near, except by the use of instruments properly adjusted? and how could their adjustment be effected? Galileo adopted the monosyllable of success for his motto —Try. He tried, and he succeeded.

It must have been noticed very early, that drops of dew upon plants magnified the veins of the leaves beneath them. A drop of water, or transparent gum attached to a hair tied in a circle, or to a hole in a piece of card, would have a similar effect. Little beads of glass found in the ashes after glass has passed through the fire have a magnifying power. But especially glass globes filled with water will enlarge the appearance of objects placed behind them, as you may observe any day when a plain water-bottle (or carafe), is on the table, and a piece of bread behind it. In addition to all this, it must have happened that when animals were killed for food, or men were slain in battle, some inquiring people would have the curiosity to examine their eyes. It is not an uncommon thing for boys, now, to beg a sheep's eye of the butcher, carefully dissect it, and examine every part. When these eyes were examined, it would be found that the lenses of them possessed a magnifying power; and from all these things together we may suppose that, very far back in the past, people had begun to aid their sight by contrivances external to the eye.

Spectacles were in use at the end of the thirteenth century, and perhaps we get faint traces of the telescope nearly as early; but the traces *are* very faint, and the claims to the invention are conflicting. This seems to be the case with almost every great discovery and useful invention. The fact is that many minds are at work, and the same thoughts sometimes occur to several men. One gets a glimpse of a thing, and lets it go; another seems to

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