



A SIXTEENTH CENTURY SPECTACLE SHOP

by E. C. WATSON

SOMETIME DURING the last decade of the sixteenth century (the exact date is uncertain) a set of 20 beautifully engraved plates entitled *Nova Reperta*, and illustrating the most important discoveries and inventions of the Middle Ages was executed at Antwerp by Philipp Galle from designs painted or sketched by Joannes Stradanus.

One of these plates, reproduced above, showed the shop of a spectacle maker, with his stock of spectacles and their use by various people. This engraving not only makes it clear that spectacles were in general use in Europe before 1600 (actually they came into use in Italy near the end of the thirteenth century—*E&S*, February 1954), but it is also of special interest because of the place (Antwerp) and the time (about 1600) at which the original was executed. For it was in Middleburg, less than 50 miles from Antwerp, in just such a spectacle-maker's shop, that in 1590, or thereabouts, a lens-grinder named Zacharias Jansen combined two spectacle lenses to form the first compound microscope.

And it was in a neighboring shop in the same town, in 1608, that another spectacle-maker, Hans Lippershey, combined two other lenses to produce the first practical telescope.

This legacy from Stradanus and Galle enables us to understand at a glance how the practical discovery of both the compound microscope and the telescope came to be made.

Lippershey, while holding two lenses, one in each hand, happened to direct them towards the steeple of a neighboring church and was astonished, on looking through the nearer lens, to find that the weathercock appeared closer and more distinct. Subsequently he fitted the lenses into a tube in order to adjust and preserve their relative distances.

It is not surprising, of course, that once a telescope of this kind was made, the discovery was claimed for many people. The surprise is rather that it was not made in clean-cut fashion much earlier.

One of a series of articles devoted to reproductions of prints, drawings and paintings of interest in the history of science—drawn from the famous collection of E. C. Watson, Professor of Physics and Dean of the Faculty of the California Institute.