Abstract. This paper gives a review of the results of optical observations of solar flares. Observations carried out in the H$_a$ line, flare spectra, and the methods of analysing the flare spectra are briefly discussed. Great attention is paid to the continuous emission of flares in the optical spectral region. In the last section, optical aspects of proton flares are summarized.

1. Early Observations of flares

More than a 100 years ago, on 1 September 1859, CARRINGTON (1859) and HODGSON (1859) when drawing sunspots on the solar disk, observed a brilliant brightening in a large sunspot group, clearly visible in the integral white light for about 7 minutes. A magnetic crochet recorded at the same time, severe magnetic storm starting 17 hours later, and an aurora observed on 2 September proved that this brightening had been the first solar flare to be observed by astronomers on the Earth.

White light flares, however, are very rare. The next one was observed 32 years later, on 17 June 1891, by TROUVELOT (1891) and another 30 years had to pass before the third white light flare was recorded by MARTHAY (1922) on 21 September 1921. For a continuous emission of flares is a very extraordinary phenomenon. The flare emission is concentrated in individual strong spectral lines, and the intensity of the integrated flare light is usually negligibly small when compared with the background radiation of the photosphere.

Of course, in the meantime, spectroscopic methods made possible to observe the spectrum of various parts of the solar disk. Thus, in the second half of the nineteenth century several flares were discovered as extraordinarily bright emissions in the H$_a$ and H$_\beta$ lines of the Balmer series of hydrogen and in the D$_3$ line of neutral helium, by means of a prominence spectroscope.

Hale's invention of spectroheliograph allowed the first photographs of the solar disk in the H$_a$ line. By means of this new instrumental equipment, HALE (1892) for the first time obtained a photographic picture of the large solar flare of 15 July 1892 followed by a very severe magnetic storm 20 hours later.

All discoveries of flares by prominence spectroscopes and spectroheliographs, however, were purely accidental. More regular flare observations could not start before the invention of spectrohelioscope, a modified form of the earlier spectroheliograph. The Hale's spectrohelioscope made possible quick visual inspections of the solar disk in the light of the H$_a$ line so that discoveries of solar flares became much easier. The number of observed flares was steadily increasing during the first three decades of this century and since 1934 lists of flares have regularly been published in the Bulletin for the Character Figures of Solar Phenomena, afterwards (since 1939)
called the *Quarterly Bulletin on Solar Activity*, edited by the Eidgenössische Sternwarte in Zürich.

2. Flare Observations in the H\textsubscript{α} Line.

Measurements carried out by Hale’s spectrohelioscope can yield information about the location of a flare on the solar disk, about its shape, size and intensity in the light of the H\textsubscript{α} line and on the time development of these quantities. As direct measurement of intensity in a spectrohelioscope is difficult, WALDMEIER (1941) suggested to substitute the line intensity measurement by a measurement of the H\textsubscript{α} line width. By means of a turnable planparallel plate the position of the H\textsubscript{α} line can be measurably shifted against the slit of the spectrohelioscope. If the slit coincides with the centre of the H\textsubscript{α} line, one observes the maximum relative intensity of the flare against the background chromosphere. If the line on the slit is shifted towards its wing the relative contrast of the flare decreases and at some distance from the centre of the line the flare ceases to be visible (Figure 1). According to FRITZOVÁ (1964), this distance roughly corresponds to the point of the line profile where the intensity ratio of flare/background chromosphere decreases to about 0.1. The difference in Angstroms between the two points of the flare disappearance at the blue and red wings of the line is called the *effective H\textsubscript{α} line width*. Its change is a very sensitive measure of the flare development.