Astronomical Broadsheets, Forerunners of the IAU Circulars

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Astronomical news stories have always sold well, but the way of presenting celestial phenomena to the public has changed somewhat during the centuries, from broadsheets to present-day popular journals. Drs. Philippe Véron and Gustav Tammann, at the ESO Scientific Group in Geneva, and both well known for their important work on extragalactic objects, have recently studied a large number of old texts in order to see whether they contain astronomically valuable information. It appears that although most of them emphasize the sensational rather than the strictly scientific point of view (not quite unlike many newspapers of our days!), some still give us new insight into old astronomical observations.

More than a century ago, astronomers felt the need of exchanging fast information concerning transient objects like comets, novae and supernovae. A Central Bureau was created to receive and dispatch all relevant information. During its first meeting in Rome, in May 1922, the International Astronomical Union organized, among many other commissions, a Commission for Astronomical Telegrams, which took over the responsibility of the Central Bureau. Since 1965, this commission is headed by Dr. B. Marsden at the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts, USA.

However, the need for information was not new; at all times, when a spectacular event appeared in the sky, people wanted to know what it was and what it meant. This need for news covered indeed a much broader range than celestial events, and after the invention of typography in the middle of the 15th century and the diffusion of the printing press throughout Europe in the following decades, a vast number of information *broadsheets* and *tractati* were published to describe and explain every single possible event: battles, robberies, miracles, abnormal births, death of princes and kings, floods and earthquakes, fires and lightnings, crimes and accidents and, what is more interesting for us, celestial phenomena, including aurorae borealis, bolids, eclipses, conjunctions, galactic supernovae (fig. 1), comets, and even the variable star Mira Ceti. The tractati were small booklets containing up to 16 pages; the broadsheets were single sheets printed on one side, their upper half being normally covered by a dramatic title followed by an illustration, their lower half by a text. Until the beginning of the 17th century, the illustration was a xylography, most often coloured by hand or by means of stencils; then it was replaced by a copper-plate engraving or an etching.

These publications were hastily prepared, not only because the public was anxious for news but also because the competition was strong between the publishers of the same city. No evidence is available of the prices at which broadsheets were sold, or of the number produced in one printing; prices are never marked on broadsheets. The broadsheet was manifestly intended for popular consumption and no doubt retailed at appropriately popular prices.

The size of individual editions was certainly not constant, but five hundred copies is probably the right order of magnitude; however, these sheets, like our modern newspapers, were usually not kept; they were thrown away after reading, and this is why they are now extremely rare; for most of them we know only one copy and a large number are probably definitively lost.

We know more than 220 astronomical broadsheets, most of them describing comets. The earliest broadsheet describes the meteorite which fell on November 7, 1492, in Ensisheim, a village in Alsace (now in France); the latest is a French one showing comet Donati in 1858; thus more than three and a half centuries of spectacular astronomical events are covered by these publications.

Most of the broadsheets were printed in Germany, however a few are known to have been printed in Austria, Czechoslovakia, Denmark, England, France (fig. 2), Italy, the Netherlands, Sweden and Switzerland.

The Tycho Brahe supernova of 1572 was shown on 6 broadsheets, but described as a comet on 3 of them; the Kepler supernova of 1604 has produced only one sheet. A very interesting broadsheet was printed in Stettin in 1677 to describe "the new wonderful star which appeared on the neck of the Whale at the end of this year 1677 and is still visible now as a star of third magnitude".

The variability of Mira Ceti had been discovered in 1639 by a Dutch astronomer, Phocylides Holwarda.

The earliest cometary broadsheets are dated 1531, the year of Halley's comet; since that date, each bright comet was the subject of one or several sheets. In total 28 comets have produced 208 presently known broadsheets, of which 62 refer to the exceptionally large comet of 1680.

Have these publications any scientific importance? In some cases they contain useful information on the position and the path, on early sightings and the visibility of the phenomena, but generally these data were compounded already by contemporary authors. Unfortunately the answer is therefore no, except in a few cases. One of these exceptions, where a broadsheet contributed to clarify a puzzling comet orbit, should be mentioned here.

In 975 A.D. a comet was visible for three months. Then a very bright comet with a tail length of 100° appeared in 1264 and lasted for four months. Again a "terrible" comet was observed from February to May, 1556; at peak brightness it rivaled Jupiter, and it is said to have motivated the Emperor Charles V to his abdication. For this reason it is sometimes referred to as the comet of Charles V.

The story of these three comets obtained a new dimension when their data were combined: the Canon Pingré, who is remembered for his excellent "Cométographie", computed the orbit of the comet of 1264 and noticed that its elements were similar to those of the comet of 1556. The elements of the latter had been computed before by Halley, who used the observations of Paul Fabricius, a physician and mathematician of Charles V in Vienna. Pingré concluded that the observations of 1264 and 1556 referred to the same periodic comet having a period of about 292 years; in that case also the observation of 975 would fit reasonably well, and Pingré predicted the comet's return in about 1848.

Newe Zeitung.

Von dem wunderbaren newwen/vnnd vor nicht mehr gesehenen Sternen/welcher sich noch auff heutigen tag erzeigt vnd sehen lasse/in disem 1573. Jar den zwentzigsten January/ wirt hie auff das aller kürtzest angezeigt vnnd beschriben.

VOr zwey Monaten hat sich ein newwer Stern von der natur Jouis vnd Martis so hievor zů keinen zeiten ersehen/deß himels herfür gethon/ welcher seines ohrts vnnd grösse halb sehr wunderbar ist. Dann erstlich haben deß himels kündige Astronomi vñ Mathematici/welche aller Sternen/öhrter/grösse vnd natur eigentliche beschriben vnd eingeregistriert an disem end deß himels keinen disem gleich gesehen/noch erlebet/weil er an S. Jacobs straß auß dem gestirn Cassiopeia genant/ seine stralen herab wirfft/gar nahe dreissig grad von vnserē sichtigen Polo oder Weltwürbel/gegen dem Hauptpuncten gerechnet so doch dise Constellation von jhe zeiten her derma ssen keinen gehebt. Derhalb er auch bey vns nimmer vndergeht sonder abends vñ morgens daher leuchtet.

Seiner grösse halben vbertrifft er alle anderen angehefften Firmaments sternen/also das er dem lieblichen Jupiter(welcher abendts stracks von dem selbigen gegen Mittag steht)vast zůuergleichen/blitzget aber vnnd zwitzeret sehr/das es sich ansehen leßt/ er vberhöhe der Comeren vnd Planeten weitstand von der erden/ benebē weil er sein ohrt nicht enderet.

Auß diesem vnnd anderen dergleichen vorgehenden Wunderzeichen/vnd dem darauff volgenden trübsal/vnglück vnd allerley straffen/so wir in Historien hin vnd wider allenthalben vberflüssig befinden/hat jederman leicht zůerachten/ Das fürnemlich in erscheinung der vngewonlichen/vbernatürlichen Wunderzeichen/wol warzůnemmen vnd zůbetrachten ist/ Dann es bezeugets die tägliche Erfarung/ sampt vnzälichen ergangenen Geschichten/ der vorigen zeit diser Welt/mit der that vnnd warheit/ Das auff vorgehende vnnatürliche Wunderzeichē/ jeder zeit grosse mercklich verenderung der Regiment vnd Vnderthonen/sampt allerley schrecklichen Vnfählen/ elend/ jamer vnnd allerley straffen/inn der Welt ervolget seind/ Denn sie nicht lär abgehen/ohne bedeutung schrecklicher vnfähle/wie dann solches im fahl der not/ auß heiliger Göttlicher Schrifft/vnd allerley anderer Völcker Historien/gnůgsam zů beweisen ist. Nach dem aber bey vns/ gleicher gestalt/diser jetzt beschribene Stern vnnd Wunderzeichen/neben vilen andern auff Lend vnd Wasser/geschehenen vnnatürlichen Zeichen vnd Wundern/so disem jetzt erscheinenden Sternen vorgangen/das solche/ohne nachfolgende straffen/nicht lär abgangen seind. Vnd ist aller dingen zůbesorgen/das Gott der Allmechtige/als ein gerechter Richter/eine scharpffe Rüthen/oder stäubäsem/vber das vnbüssfertige Teutschlandt/allbereit gebunden/vnd außgereckt habe/ Damit er die grosse sicherheit vnd vndanckbarkeit desselbigen/ dermassen daheim süchen vnnd straffen werde/das wir hernacher ein güte zeit darüber zů klagen haben/ Es seye denn/das wir inn der zeit/disē vnd andere Warnungen/zů hertzen führen/ vnnd ernstliche Büsse thůn/ehe den die straffe ins werck gebracht vnd gesetzt werde.

Gott verleyhe vns sein gnad:/Amen.

Fig. 1: *Broadsheet with Tycho's supernova by an anonymous author (January 1573). This "News sheet about the miraculous new ... star" describes the puzzling appearance of a new star of the "nature of Jupiter and Mars" in Cassiopeia. It has been visible for two months, it is almost as bright as Jupiter, its distance appears to be larger than that of comets because it scintillates and no parallax can be detected. The author considers the star to be a sign of the wrath of Almighty God threatening changes of the government, accidents, poverty and other punishments; these dangers can be turned aside only by immediate penance. "God grant us mercy, Amen." (By permission of the Zentralbibliothek Zürich, Graphische Sammlung.)*

Fig. 2: *A late French broadsheet about the big comet of 1843. The contrast is strong between the rather dramatic title written to attract the reader and the sober and scientific text citing Arago and Herschel. However, a ballad printed at the end shows that the public still needed some superstition in addition to the dry scientific facts: the comet is a rather good sign, the wine will be good next autumn. (Phot. Bibl. nat. Paris.)*

A few years before, a Cambridge astronomer, Richard Dunthorpe, had reached the same conclusion. When the time of the expected return approached, the British astronomer Hind repeated the orbit determination of the 1556 comet and convinced himself that it was identical with the comet of 1264; however, he remarked that the orbit could have been strongly perturbed by Saturn and Neptune and its return delayed by one or two years. When in 1849 the comet had still not appeared, B. Bomme in the Netherlands attempted an accurate perturbation calculation; he found the observations wanting in quality, but by assuming that the comets of 1264 and 1556 were identical he predicted its return for the period 1858 to 1861. Then a German astrologer choose for still not known reasons—if for any at all—the arbitrary date of 1857 for the return of the comet and speculated that it would cause the end of the world on June 13. This expectation stirred quickly a mass hysteria, which bore particularly in Paris the most incredible fruits. A little novel could be written about these events, but it suffices to note that the comet of 1857 never came.

What had happened? Where was the error? The answer was provided by Martin Hoek, an astronomer at the Utrecht observatory; he proved conclusively that the comets of 1264 and 1556 were *not* identical. Hoek's decisive advantage was that K. L. v. Littrow had not only found a pamphlet by Joachim Heller, which contained additional observations of the 1556 comet, but also the original source with Fabricius' observations: it was a broadsheet with a map of the comet's course! Littrow's discovery in the State Archives of Vienna occurred already in 1856, but its implications remained unnoticed until Hoek. Pingré and Hind had searched in vain for this original source, yet once it had been found it could be shown that Halley had not used this original source, but only a much deteriorated version of Fabricius' map, published by Lycosthenes in Basel in 1557.

The Vienna broadsheet seems to be lost again. But fortunately a Latin translation of the same sheet was discovered a few years ago. It has survived to our days because it had served as an end-leave of a folio volume, and it is now in the Houghton Library in Cambridge, Mass. (fig. 3).

While the scientific yield of astronomical broadsheets is generally meagre they still contain a wealth of other information. They are interesting for the historian of astronomy, because they give insight into the contemporary interpretation of celestial events; some of the broadsheets are even signed by well-known astronomers, such as Johannes Schöner, Peter Apian, D. Herlicius, W. Schickard, and A. Kircher. Thus they contribute to the bibliography of quite a few astronomers and, of course, they also give a more complete picture of the production of many printers, some of which, as it turns out, were specialized in the printing of broadsheets. Other sheets are, with their illustrations, of interest for the historian of art and, surprisingly, for historians of literature and church songs, because during the baroque they frequently contained poems or songs on the "frightful" sightings. But above all the broadsheets demonstrate in a very impressive way the fascination in celestial events and particularly comets, which people felt in former times. It is a matter of course that this fascination revolved around many superstitious and astrological views, and for the knowledge of these views and their gradual change the broadsheets are a very important source.

Fig. 3: *Broadsheet of 1556 showing the course of the comet of that year. Its author is Paul Fabricius, Imperial Mathematician in Vienna. Only the upper part of the broadsheet is shown here. The Latin text, consisting of 50 lines, describes briefly the observations and speculates on the comet's effects from an astrological and Christian point of view. (By permission of the Houghton Library, Harvard University.)*

Tentative Meeting Schedule

The following dates and locations have been reserved for meetings of the ESO Council and Committees:

May 15	Scientific Technical Committee, Geneva
May 16	Committee of Council, Geneva
May 17	Users Committee, Geneva
May 29–31	Observing Programmes Committee, Liège
June 12	Finance Committee, Munich
June 13	Council, Munich