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Ed. A. Heck, (c) Kluwer 2000

FOREWORD

Research and publications in the field of Astronomy have undergone dramatic changes in the last half-century.

While activities just slowed down during World War II in the US and in Latin America, they were very strongly affected by the difficult conditions prevailing among the European belligerent nations. Half a century ago, research activities were mostly confined to observatories (linked or not to universities) and usually separated from the teaching of physical sciences. Hence, directors of observatories played an important rôle in the choice of the research fields, and "schools" of research appeared at various places, developing specific instrumentation, reduction techniques and mathematical methods to achieve their scientific goals.

Reorganising the research activities after the war was no minor undertaking, specially because communications were interrupted for over five years and isolated continental Europe from overseas activities. Scarcity of observing instruments (some of them being requisitioned by occupying armies), enormous gaps in the available litterature led to local research activities, conducted independently of similar efforts undertaken elsewhere.

It was also almost impossible for university students to have access to any type of instrumentation, which was reserved to staff members in observatories. For instance, around 1955, there were in continental Europe barely more than five spectrographs permitting to obtain albeit low-dispersion stellar spectra. It is significant that the quantitative analyses of the chemical composition of stellar atmopheres conducted with methods developed in Europe up to 1960 were carried out in using observing material obtained in California or in Western Canada.

Publications were then first announced as short notes in circular letters from Observatories or in reports to learned societies, sometimes published on a weekly basis. The late 1950's seem to be the turning point of such observational and editorial policies. Committees of all kinds flourished in conjunction with a revival of the international contacts mainly due to an important increase of activity of the *International Astronomical Union*

(Moscow, 1958; Berkeley, 1961) and also the blossoming of the "Space Age" astronomy, which implied, especially in Europe, coordinated efforts of several countries, whatever were their desires to keep up national programmes (which anyway lasted only for a few years' time).

Such an enterprise of international cooperation served as a model for ground-based astronomy, which resulted in desinvesting in national facilities, leaving the existing institutions in a rather unconfortable situation. In some European countries, it is nowadays not rare that the amount of money spent for astronomy in international organisations is by far superior to what is actually available in the country itself for the same purpose. This is true not only for smaller countries, but also for middle-size nations. Of course, it is much easier for the latter to set up cells in the said organisations and through this lobbying action to regain command on the general policy of international institutions.

Similarly, access to common observing facilities is severely limited for projects proposed by individuals, and most of the alloted time is given to teams with great experience and reputation, which themselves in turn send newcomers to the observing sites. As a result, a considerable amount of research time is devoted to the submission of proposals which give numerous details not only on the purpose of the investigation, but on the objects to be observed, with all pertinent instrumental circumstances, the methods of analysis, if not guesses about the expected results.

The examination procedure lasts for several months, being reviewed by experts, sub-experts and advisors not in minor numbers. As a result, the observations will be actually carried out, weather permitting, at best four to six months after the proposal has been submitted. If the latter is put aside, either due to enormous pressure factors on some of the instruments, or to referees' advices (although they are not infrequently divergent), the whole procedure is deferred by one year, at least for observations with ground-based instruments.

The overall guarantee of the pertinence of the projects is certainly improved compared to the judgement of a single observatory director, often influenced by recommandations by friends or trustees of his institution. But, one may wonder how long-lived but successful undertakings could have been achieved in the past if the current procedure had been applied to projects which required specific instrumentation for runs of two or three nights on a quasi-monthly basis for several years.

The "Space Age" astronomy has brought up still quite a different time scale for the acquisition of new type of data. The time elapsed between the first formulation of a proposal and the availability of the data to the astronomical community reaches often several years if not decades. Over thirty years passed since Pierre Lacroute first proposed in Strabourg his

idea of an astrometric telescope in orbit and the actual publication of the Hipparcos catalogues bringing the knowledge of the parallaxes and proper motions to a level which seemed outside of any reasonable hope in the early sixties. On the astrophysical side, the idea of a sky scanning telescope collecting ultraviolet fluxes from stars over the whole sky in six month's time was proposed in Paris by H.E. Butler in July 1962, but the catalogues containing the stellar fluxes from 135 to 274 nm appeared between 1976 and 1978, after Butlers untimely death.

Astronomical space agencies developed therefore a specific methodology for deciding upon the instrumentation to be put aboard spacecrafts. Both scientific originality and technical feasibility are of crucial importance for selecting the projects. Of course, once in orbit, space observatories may be run somewhat as their ground-based counterparts. Fortunately, because of the high cost of the data, calibration and archiving systems reached a quality that alas never existed in ground-based observatories (with some notable exceptions).

As a consequence of the technical advances in instrumentation and of the enormous steps in numerical analysis brought by computers, the publication of astronomical data and their analysis radically changed over half a century. The astronomical research production has been investigated by several authors, especially in Northern America, but anyone browsing around libraries of astronomical institutes will not be astonished to learn that both the number of contributions and the number of authors is in state of continuous expansion.

In 1976-1977, about 35% of the astronomical literature were produced in the USA, but one may wonder how the remaining 65% were distributed over the rest of the world. An inspection of the number of pages published during these two years by astronomers of various countries in the main journals in Western Europe, *Astronomy and Astrophysics* and the *Monthly Notices of the Royal Astronomical Society* over that period (when the impact of space astronomical data was still rather limited) led me to conclude that the importance of astronomical production, though mainly supported by public funds, is basically linked to the economical activity of the country where the investigations are conducted.

One finds that on the average 0.9 of equivalent *Astronomy and Astrophysics* printed page is produced per billion of US $ of GNP. This is true for Western European countries for which most of the astronomical results are published in these two journals. There are however two notable exceptions: the first one is the Netherlands, which produce 2.3 times the average European research and the UK, with a factor of two. Countries where the British influence settled for centuries distinguish also themselves of nations of similar economical importance. On the other side, in 1976-1977, Spain

brought a very low contribution to European astronomy, a situation which radically changed in the recent decade.

The book proposed by André Heck comes in due time. The authors are well-known researchers in the various fields investigated: evaluation of scientific proposals, refereeing systems, publications and life of astronomical organisations. The relationships with the general public have not been forgotten. Professional astronomers will be happy to find in this book lots of ideas on how their preferred science has developed in the recent years, and so they will be able to make up their mind as to the methods to be applied in order that the results in the future accomplish the promises of a glorious past.

Léo Houziaux
Royal Acad. Belgium
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