

# Twentieth-Century Amateur Astronomy

*A.J. Meadows*

Department of Library and Information Studies, Loughborough University,  
Loughborough LE11 3TU, United Kingdom

Little distinction was drawn between amateur and professional astronomers for much of the nineteenth century. They mixed in the same scientific societies and often carried out overlapping studies. Towards the end of the century, however, new factors arose – increasing expense of instrumentation, increasing sophistication of theoretical knowledge, etc., which led to a greater degree of differentiation. It was then that societies specifically aimed at amateurs were established. The split has never been complete – professionals have always been members of amateur societies and vice versa – but a gap between amateur and professional opened up and has continued since. Amateurs of the standing of Percival Lowell, who could compete with professionals both in terms of equipment and theoretical knowledge, effectively died out before the mid-twentieth century.

Most countries with an astronomical tradition have developed amateur societies at two levels – the national and the local (or regional). Many amateurs belong to both types: virtually all serious amateur astronomers are affiliated to one or the other. In total, the number of amateur astronomers in the world has always exceeded the number of professionals; so their activities must always be taken into account in discussing the history of astronomy – even its recent history.

The membership of amateur societies typically shows a fairly even spread of ages (with more younger members than professional societies). This is illustrated in Table 1 (Fisher, 1980). In addition, the proportion of female members is usually higher in amateur societies. The impetus for the separation of the British Astronomical Association (BAA) from the Royal Astronomical Society (RAS) was, in part, connected with this. To quote the BAA's original statement of aims, it was intended "to meet the wishes of those who find the subscription of the Royal Astronomical Society too high, or its papers too advanced; or, who are, as in the case of ladies, practically excluded from becoming Fellows". The BAA practised what it preached.

**Table 1**

Age in years	Under 25	25–44	45–64	Over 64
% of members	20	35	35	10

The main group of observers sent by the BAA to the solar eclipse of 1898 consisted of ten men and five women. Nevertheless, the proportion of women in amateur astronomical societies – typically 10–20% – has always been considerably lower than in amateur natural history societies.

Amateur astronomical societies are seen much more than professional societies as a means of obtaining training. Stebbins (1980) has distinguished between three types of amateur astronomer – the apprentice, the journeyman and the master – in a way that emphasises this training aspect. The apprentice is primarily concerned with learning about the subject; the journeyman is a knowledgeable practitioner who can work independently; the master is actually in a position to contribute to astronomy. The journeymen turn to the masters when they run into difficulties. Both groups pass on their knowledge and experience to the apprentices. The importance of this training activity stands out clearly when amateurs are asked what the chief aims of their society should be – see Table 2 (Fisher, 1980).

**Table 2**

Essential aim	% fully agree	% partly agree
To provide a meeting place for like-minded people	90	7
To provide more theoretical knowledge	70	23
To provide facilities for practical work	68	25
To provide a library	36	39

Table 2 seems to suggest that members of amateur societies place theoretical knowledge and practical work on a par with each other. In fact, this hides an interesting difference between amateur and professional astronomers. Amateurs tend to despise “armchair” astronomers: society members are expected to be out there observing or developing instrumentation, or, at least, calculating orbits. “Masters” are typically members with particular skills in these areas. In professional astronomy, on the contrary, observers often believe that they are allotted less prestige than theoreticians. Amateurs often join societies especially to gain advice about equipment. This frequently includes tuition in the building of telescopes. Earlier in this century, societies might be devoted almost entirely to telescope making. Though most now have a more balanced approach, there are still many amateurs who find working on instrumentation more satisfying than actual observation.

As Table 1 suggests, amateur societies contain appreciable numbers of young members who are still receiving full-time education. These are almost always in the apprentice category. What they learn in the society motivates a significant proportion of them to contemplate acquiring professional qualifications. Though only

a small fraction actually do so, the amateur societies provide a valuable source of professional observational astronomers.

Most amateur societies try to provide some kind of publication, even if only a brief newsletter. Since this often depends on individual initiative in local societies, such publications tend to be ephemeral. At the national society level, of course, the publications are much more stable and durable. An appreciable proportion of society members (10–20%) have talked, or written about astronomy for groups outside their society. Amateur astronomers have always provided a useful channel for transmitting an idea of astronomy to the general public. Indeed, they are often as successful as professionals in presenting astronomy via the media.

Throughout most of the twentieth century, amateurs have differed from professionals in the celestial objects they preferentially choose to study. By the latter part of the nineteenth century, amateurs were finding the professional emphasis on precise positional measurement coupled with extensive mathematical analysis both too demanding and too boring for them. The new science of astrophysics attracted them immediately, and many of the early advances in this field were made by amateurs (e.g. Sir William Huggins and his wife). G.E. Hale stood at the end of this particular line of development. His early work on the spectroheliograph was carried out on an amateur basis at his own observatory in Chicago. But soon, as a professional astronomer, he was seeking to improve the provision of telescopes in the USA. This led in a few years to the demand for bigger telescopes. Increasingly, professional astronomers were changing their focus of interest to faint objects – stars and galaxies. Correspondingly, their interest in Solar-System objects diminished. Amateurs could afford neither large telescopes, nor the sophisticated ancillary equipment that accompanied them. So a division grew between the astronomical topics of amateur concern and those of professional astronomers. A professional astronomer, H.H. Turner, wrote a song for the BAA in the 1920s (to be sung to the tune of “The British Grenadiers”). One verse lists the observational interests of BAA members (JBAA, 1930).

“It [the BAA] groups itself in Sections, for Meteors or for Mars,  
While one has predilections for Variable Stars,  
Nor is the Moon neglected, nor Comets, nor the Sun  
By the British Astronomical Association”

The separation between this amateur interest in the Solar System and the professional emphasis on stellar and galactic studies was underlined in 1930 by the discovery of Pluto, which can be regarded, from one viewpoint, as the greatest contribution of the amateur tradition to Solar-System astronomy in the twentieth century. The Lowell Observatory was still faithfully following Percival Lowell’s precepts, and the planet was itself discovered by a young amateur, Clyde Tombaugh.

Over the past quarter of a century, the growth of space research has done a great deal to reduce this separation. In the early days of the space age, professionals discovered that they could learn from amateur astronomers – for example, of activity in Jupiter’s atmosphere. In several areas, amateur and professional activities complement each other. An example is the discovery and observation of comets, where

amateurs still play an important part despite the greatly increased professional involvement. In a quite different area of space science, the work of an amateur, H.H. Nininger, in collecting meteorite samples, proved of considerable value to professional meteorite studies in recent years. Amateurs, perhaps because their reputations were less at stake, were often more ready than professionals to consider the possibility of spaceflight in the pre-space age days. It has turned out that artificial satellite observation is probably the most important new area of amateur observation in the twentieth century. Visual observation of satellites by amateurs still provide a useful input of information to professional studies.

The division between the Solar System for amateurs and the remainder for professionals was, of course, never anywhere near complete. Some amateurs during the twentieth century have contributed to observations of visual binaries, but this is an area where professional interest has declined from the nineteenth century. The topic which both amateurs and professionals have found fascinating throughout the century is variable stars. The extent of the amateur commitment to variable-star observations is indicated by the history of the American Association of Variable Star Observers (AAVSO). This celebrated its 75th anniversary in 1986, when it had 1,300 members spread over more than forty countries. Between them these members are making annually a quarter of a million estimates of stellar brightness.

However, the most important amateur contribution to observations outside the Solar System came, not from a society, but from an isolated observer. During the 1930s, an American radio engineer, Grote Reber, followed up Jansky's initial observations of radio noise from space. He constructed the first parabolic radio antenna and used it to map the intensity of radio emission from the Milky Way. His discussions with professional astronomers and subsequent publication of his results in the *Astrophysical Journal* became one of the significant starting points for the new science of radio astronomy.

Though much has changed during the twentieth century, the role of amateur astronomical societies has not altered very greatly. *L'Astronomie* (1937), reporting on the fiftieth anniversary of the Société, had this to say:

“Un de nos collègues nous demandait un jour le secret du succès de la Société Astronomique de France et de l'atmosphère si sympathique qui y règne. Ce secret, nous semble-t-il, est que toutes les fonctions y'étant gratuites et les collaborations bénévoles.”

This description surely has a wider applicability in amateur astronomy. A few years ago, young astronomers went round in T-shirts bearing the inscription – “Astronomers do it at night”. I translate this passage from *L'Astronomie* as an equivalent inscription applicable to all ages – “Astronomers do it with pleasure”.

## References

- T. Fisher (1980). *The Role of the Amateur in Science*, Ph.D. Thesis, University of Leicester, U.K.  
JBAA (1930). *Journal of the British Astronomical Association*, **41**, 52  
*L'Astronomie* (1937). *L'Astronomie*, **51**, 503  
R.A. Stebbins (1980). *International Journal of Comparative Sociology*, **22**, 34