

# Chapter 11

## Popularization

*Astronomy is fortunate in being one of the most attractive sciences to the general public. We hear first the personal story of a prolific author and television popularizer of longest standing. A group of three papers discusses amateur astronomy and its role in education. A series of papers then considers astronomy for the general public in Mexico, India, Scotland, West Germany, New Zealand, and Australia.*

*Several of these papers discuss public observatories, which are particularly numerous in Europe. Finally, we read about efforts in Australia and the United States to bring astronomy to students older than the traditional student population.*

### THE POPULARIZATION OF ASTRONOMY

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I suppose it is inevitable that astronomy should be one of the easier sciences to “popularize.” The sky is all around us; even our remote cave-dwelling ancestors must have looked up into the sky and wondered at what they saw there, even though they could have no idea of the nature or scale of the universe. Naturally, they believed the Earth to be supreme, and to have everything else arranged around it for our special convenience. Believe it or not, this point of view is not quite dead even now — and this brings me on to my first point.

Some time ago I attended a meeting of the International Flat Earth Society, held in London. Its members believe that the world is shaped like a pancake, with the North Pole in the middle and a wall of ice all around. The meeting was quite remarkable, and participants were totally sincere. Later, I rather ill-naturedly put them in touch with a German society whose members maintain that we live on the inside of a hollow sphere, and I understand that they are still fighting it out; but of course this is quite harmless — and as I have often said, the world would be poorer without its “Independent Thinkers.” But other aspects of eccentric thought are less laudable, and of course I am thinking of astrology, which has experienced a curious revival in recent times. Regrettably, it has even been given tacit approval

by a few professional astronomers who certainly ought not to be lured into making unwise statements. I will not take this any further; suffice to say that in my view, it is essential at the outset to make a clear differentiation between astronomy and astrology. I maintain that astrology proves only one scientific fact — “There’s one born every minute” — but it can do harm.

I come now to pure astronomy. And I think I must ask your indulgence if I spend a minute or so in a personal view, because unlike most of you, I am not a professional astronomer, and have never been. My doctorate of science is an honorary one. What should have been my university years were spent flying; this was the period from 1939 to 1945, and again there is no need to say more about that aspect now.

My first interest, and still my main interest, concerns the Moon, and this was also the subject of the first book I ever wrote under my own authorship (it had been preceded only by a translation from the French of Dr. Gérard de Vaucouleurs’ admirable little book about Mars). In 1957 I began my BBC television series *The Sky at Night*, which still continues; I have not missed a month since then, which I understand is something of a record. But the longevity of the series is not due to me; it is due entirely to the subject; each program is watched by around 4,000,000 viewers, so it may have been some help in “spreading the word.”

There are some obvious traps into which it is too easy to fall, and into which I have no doubt fallen on many occasions. First, astronomy is a spectacular science, and there is an obvious tendency to overdramatize it. In a popular book, or for that matter a television program, it is simple to show view after view of “what Mars may be like,” “an alien civilization on Beta Cygni C,” or “astronauts touching down on a planet of a sun inside the Hercules cluster.” In moderation this is all very well, but if taken too far it can lead to a completely false impression of what it is all about.

Secondly, you need to maintain the novice’s interest, and to delve too deeply into technicalities straight away means that those who are not genuinely fascinated will drift away. It means steering a middle course.

When I started my television series, the Space Age had still not begun; it was six months later that it was opened by Sputnik 1 — not with a whimper, but with a very pronounced bang. The change in outlook was evident at once, and it was sometimes assumed that the only object of studying astronomy was to send men to the Moon. This was also the time of the popular awakening to the value of radio astronomy, with the inauguration of the 250-foot (76-meter) “dish” at Jodrell Bank now known, very aptly, as the Lovell Telescope. It has been said to me that radio astronomy makes all optical work obsolete — and one has to explain that all branches of the science work together rather than in separate compartments.

But perhaps the most hackneyed question of all, asked at many popular lectures, is: “What is the use of studying the stars, and sending men into space, when there is still so much to be done down here on Earth?” Some political extremists are only too eager to further this impression. One has to explain that it is no longer possible to separate any branch of science from any other, any more than one can divorce arithmetic from algebra, but when people are sufficiently indoctrinated it

takes a good deal of persuasion to drive one's point home. Not everyone can readily appreciate the close links among astronomy, physics, chemistry, medicine and biology, for example, and I am bound to say that these links are not always emphasized as forcefully as they ought to be.

Another question, which has been put to me more times than I can count, concerns the methods of "starting out." The usual letter begins: "I think I am interested in astronomy, but I do not see how I can make a start without spending a large sum of money on an expensive telescope, and this is something which I cannot afford." Here I feel that books that show nothing but amazing pictures taken with the world's great instruments are somewhat misleading. I doubt if any Voyager view of Saturn, for example, can be as telling as one's first actual view of the planet through a 3-inch (7.5-cm) telescope.

On average, I receive around forty letters per day, many of them from young enthusiasts, but also many from adults. (I answer them all, but it does take time; my ancient typewriter works overtime, particularly when I have been away for a week or two.) And my answers to the standard questions are always more or less the same. I think it may be worth my summarizing them here, though others may have different approaches:

1. *Do some reading from a suitable elementary book.* This is what I did myself, at the age of six (which takes me back to 1929). The book was called *The Story of the Solar System*, by G.F. Chambers, and it had been published in 1898, so that even then it was somewhat out of date — but the essentials were there.

2. *Obtain a simple star-map, go outdoors on a dark night, and start learning your way around the constellations.* As we all know, this is not nearly so difficult as might be thought — ask the absolute beginner how many stars he can see on a clear night, and he is apt to reply, "Millions" — and I remember making a pious resolution to identify one new constellation every night. It soon worked. The method is to select one or two obvious groups, beginning probably with Orion (if visible) and Ursa Major, and use them as guides to the rest. In fact, starting with these two only, one can in time work out all the rest. I know, because I have done it myself. The old cliché about an ounce of practice being better than a ton of theory is true in astronomy as it is true in everything else.

3. Next, if you are still interested, *consider some optical aid.* This is where the trouble often starts. Buying a very small telescope is a recipe for disaster. These tiny instruments have poor optics, small fields of view, and mounting about as firm as blancmanges<sup>1</sup>. Unfortunately, advertisers can make them seem very attractive. For years I have been waging a war against them, and I think with some success; the obvious alternative is to buy binoculars — which are much more useful to the beginner than he or she will appreciate at first.

I have a standard "telescope letter" that I send out, and I have distributed thousands of copies, mainly to young inquirers. Again, not everyone will agree with me in saying that the minimum useful aperture for a refractor is 3 inches (7.5 cm),

<sup>1</sup>[Ed. Note: A blancmange is a dessert, made from gelatinous or starchy substances, and shaped in a mold, particularly popular in England.]

and for a Newtonian reflector 6 inches (15 cm), but I feel that it is at least of the right order.

4. *Join a society.* In Britain, as in the United States, there are many local societies. We also have the national British Astronomical Association, which is mainly amateur though with many professionals, and which has an outstanding observational record. There is no actual age limit — I joined when I was eleven, though I think this was a record at the time. (I became President exactly fifty years later!)

By then I think the beginner will have settled firmly into one of two categories. He or she may simply prefer to remain an “armchair astronomer,” following what goes on and taking an intelligent interest; or he and she may want to undertake practical observing — and here I feel it is important to stress that astronomy is one of the very few sciences in which the amateur can still play a useful rôle. I need not elaborate this here; all of us know how valuable are the contributions from, for example, the comet-hunters and the nova and supernova hunters, and from those who follow variable stars and time-dependent planetary phenomena.

For your armchair astronomer, it is surely important to maintain a flow of information which is technical enough to be worth while, but not too technical to “lose” the enthusiast who has only a limited amount of time to spare for his hobby (as is almost always the case). This is where books, broadcasts, and television programs come in. When I started out, there were very few popular books either for adults or for juveniles; the book I happened to read was an adult one, but it was simply written. Nowadays, the choice is very wide, and it has to be said that the standard is very variable. There is not much that can be done about this; one has to use one’s own instinct; to sort out books that look attractive, but soon lapse into astrology and flying saucers, is not always easy.

The vital thing is that early enthusiasm should not be killed. And this is where I am bound to be slightly controversial, even though my remarks apply to Britain and may not be applicable to the United States. School subjects can be made dull. Sadly, they frequently are — and this is why I have never been in favor of making astronomy a school subject “on its own.” Of course, it is part of science classes, and must be so; but I would be unhappy to see it taught as a special subject divorced from other science classes. As things are, the would-be enthusiasts gravitate to it naturally. If it is forced down their throats, they may recoil. The ideal is to have school astronomy clubs, which are numerous and which do a splendid job.

There are, too, many adult classes that are equally useful. They can, obviously, be more specialized, and this is where I feel able to say a little more about television, simply because I have been involved in it for so long. I try to give *Sky at Night* programs at various levels — sometimes very elementary, others deeper; and where we go more deeply into a subject, I am always anxious to involve an expert who can speak with authority, as opposed to my doing it second-hand. I may add that those who have appeared on *Sky at Night* programs with include Harlow Shapley, Bart Bok, Clyde Tombaugh, Neil Armstrong, Dale Cruikshank, Fred Hoyle, Fred Whipple, Jan Oort, Yuri Gagarin, Alla Masevich — quite a galaxy! I find that the

programs are watched not only by beginners but also by those who are experts in their own fields and want to be kept abreast of what is happening elsewhere. As I have often said, your cosmologist need not be aware of the latest investigations into the behavior of clouds on Mars.

Finally, one must cater to the young enthusiast who is interested enough to want to follow astronomy as a profession. Again I have had many inquiries; I do my best to help, and I must admit that it gives me immense pleasure to find those who are now eminent in their fields, carrying out work of which I would never be capable, but who first contacted me when they were about to "start out." If I have any rôle to play in the realm of astronomy, it is in urging on others to do things that are far beyond my own capabilities.

There was a time — and I do remember it — when astronomy was regarded as a study separate from anything else, and when the popular image of an astronomer was that of an old man with a long white beard sitting in a lonely mountain-top observatory, night after night, watching the stars. Untrue though this was, it was a deeply-rooted picture. Of course it is not so today, and I think that most people are aware of what astronomy means. What we have to continue doing, I am sure, is to make certain that we present the right views — and this is being done, thanks to the many professional astronomers who realize the value of popularization. After all, the beginner of today is the researcher of tomorrow.

## Discussion

J. O'Byrne: *I agree with the comments about telescopes, and especially binoculars. However, there is a place for some smaller refractors if only because people insist on buying them. There are a few good quality 60-mm refractors available that will show the rings of Saturn, the bands and satellites of Jupiter, and the Moon reasonably well. They also provide a view of some double stars and clusters. Often a child wants a telescope and nothing larger is possible. Providing it is good quality, such a telescope can play a rôle.*

P. Moore: Saturn is a special case. With the other planets, a small telescope will show little more than good binoculars, and this also applies to the moon. In my view, there are no real advantages in a tiny telescope as compared with binoculars.

*Ed. Note: In small telescopes, the quality of the mounting is often more of a problem than the quality of the optics. No telescope of any size is of use if the mounting does not hold steady or permit setting on an object.*

S. Isobe: *There are many good astronomy books that give a whole view of astronomy. From pictures in these books, the general public sometimes thinks that the larger or the more expensive the astronomical instruments such as telescopes are, the better view of astronomical objects they can get. This is not true and we should teach what astronomical view one can get with different sizes of astronomical instruments.*