

Astronomy and astrology*

K. D. Abhyankar

When I tell people that I am an astronomer, they ask me immediately whether I can predict their future from their horoscopes. On receiving a negative reply, they look down upon me as a man of no consequence and wonder what kind of an astronomer I am. It is not their fault, because most persons including the well-educated ones, do not know the difference between astronomy and astrology.

Earlier, belief in astrology, which claimed to predict the future from the prevalent planetary positions made people assiduous watchers of the stars and planets and their observations led to the science of astronomy (खगोलविज्ञान, ज्योतिर्विज्ञान), while astrology (फलज्योतिष) remained as a superstition. Thus, over the centuries, the two fields have drifted poles apart and now astronomy differs from astrology in the same manner as chemistry from alchemie.

What is astronomy?

It is the science in which we study heavenly bodies like the sun, moon, planets, stars and galaxies in respect of their physical properties such as distance, size, mass, brightness, temperature, chemical composition, age, evolution, etc. This knowledge is derived mostly by applying the laws of physics and the technique of mathematics to the analysis of the visible light, radio waves and other electromagnetic radiations coming to us from those remote objects.

Astronomy is an observational, rather than an experimental science. But in astronomy also, the investigators follow the same logical process known as scientific method which is used in other experimental sciences. In fact, the scientific method itself was developed and first used successfully in solving the astronomical problem of planetary

motions. It may be noticed that the evolution of new ideas in the face of stark facts is the hallmark of science, which is conspicuous by its absence in astrology.

Observations of the sun, moon and the five bright planets – Mercury, Venus, Mars, Jupiter and Saturn – made from the most ancient times, gave rise to the so-called geocentric system, the theory in which these bodies were supposed to move in circular orbits around the earth which was considered to be the centre of the universe. This primitive theory could not explain many observed phenomena such as nonuniform or unequal motions of a planet in its orbit, its retrograde or *Vakra* motion which occurred at regular intervals, and the change in the brightness of the planet during the course of its revolution. So the Greek astronomer Ptolemy in Egypt and the Siddhantic astronomers in India developed a more complex theory in which an hypothetical planet (मध्यमग्रह) moved around the earth uniformly in a circular orbit and the real planet (स्पष्टग्रह) moved around the hypothetical planet in another small circle. This so-called Ptolemaic theory of deferents and epicycles explained quite well the gross features of the planetary phenomena. But as more and more observations got accumulated, astronomers had to add more and more circles and make some of them eccentric in order to account for the discrepancies between the observed and calculated positions. In India, the same thing was achieved by adding what are called the Bija corrections. In the 15th century the heliocentric theory of Copernicus removed some of the complications of the earlier Ptolemaic theory. But the real simplification came only in the sixteenth century, when Kepler showed that the planets moved around the sun in elliptical orbits with the sun at one focus of the ellipse. But our *Jyotishis* still consider the sun and the moon as planets (ग्रह) which is unscientific.

Kepler's empirical discoveries were given a firm theoretical foundation by Newton on the basis of his universal

law of gravitation. Modern astronomers use this highly refined mathematical theory of gravitation for predicting the positions of planets, sun and moon in the sky. But many of our *panchanga* makers still use the old and inaccurate Siddhantic method which gives wrong results. The old method gives completely wrong predictions of the times of eclipses by several hours. As such, mistakes would be easily detected by the general public. The *panchanga* makers dupe them by using the modern ephemeris published in England or America for the purpose without disclosing this fact to the public. In doing so, I do not at all want to belittle our excellent astronomical works of the past like *Surya Siddhanta*. In fact, those treatises represent the most advanced astronomical knowledge of their times. But to claim their infallibility in the face of modern investigations and to use them as a weapon against the illiterate and superstitious masses is certainly not pardonable.

Newton's theory left a discrepancy of 43 seconds of arc, i.e. 3 seconds of time per century in the motion of Mercury. When this was explained by Einstein's general theory of relativity, scientists agreed that Newton's law of gravitation needed a very small correction, in spite of its great earlier success. This is the true spirit of science, whereby we are always prepared to modify our views about the universe in the light of new observational evidence.

Our knowledge about the universe increased by leaps and bounds after the discovery of the telescope. In the light of modern telescopic observations, we recognize that our solar system is insignificant compared to the universe, the earth on which we live is a tiny speck in the solar system and man is nothing compared to earth, physically. However all agree that intellectually man would rate among the topmost creations of nature. So we should see to it that we use our intellect in rational and logical thought and not fall prey to superstitious beliefs which are remnants of an earlier, less-developed stage of our evolution.

*Based on article published in *Society and Science*, a journal of Nehru Centre, 1982, 5, 16–24.

Astrological concepts

This brings me back to the subject of Astrology (फलज्योतिष). In order to understand the unscientific nature of this pseudo-science, it will be helpful to look back and see how exactly the notion of prediction from star positions arose. From times immemorial, the sun, moon and stars, particularly the bright stars near the north celestial pole have served as direction guides to travellers on land and sea, and now to travellers in outer space also. Clear weather and visibility of stars were so important to the early nomads that they assigned special significance to the stars by calling them Devas, which means the shining ones, who decided their fate while travelling. The sun and the moon were of course the brightest and so the most important Devas, which were perhaps later transformed into Vishnu and Shiva concepts. Man was therefore right in concluding that the association of the sun as well as the moon with the Nakshatras determined the seasons, and through them the well-being of the people. It was thus that the idea of conjunction (युति) and its effect was born. Later on, when the five naked eye planets, which wandered through the Nakshatras at different speeds, were discovered, they also received the status of Devas and their conjunctions with the Nakshatras and with one another were similarly thought to be able to produce good or evil effects, giving rise to the notions of astrology.

The *Jyotishis*, who could predict the positions of the sun, moon and planets by mathematical calculations, were shrewd persons who told people that they could predict future events also. At first, these predictions were supposed to apply to the whole world, which in those days was limited to their own locality. But the observed differences between individual men and women made them postulate that it was the effect of the planetary positions at the time of the birth, i.e. the horoscope. The astrologers took advantage of the fact that the periods of the heavenly bodies are such that they span different periods of man's life to back up their hypocritical claims. We now know that the characteristics of a person are determined when the egg and sperm fuse together at

the time of conception. They have nothing to do with the planetary configuration at the time of the birth. Also, the seasons associated with the conjunction of the sun and full moon with given Nakshatras change with the passage of time due the phenomenon of precession of the earth's axis.

It is true that the sun's radiation is the main source of energy for the creatures of the earth and it affects their growth very significantly. Similarly, it is the attraction of the sun and moon which cause oceanic tides. But all these effects are physical and they affect the earth as a whole, and not individuals in particular. From the laws of physics it is clear that the planets cannot greatly affect the weather and other terrestrial phenomena, let alone the lives of individuals on the earth's surface, as claimed by the astrologers.

So there is no need for us to be afraid of the imaginary effects of the harmless planetary configurations. Even astrologers know this, but in order not to lose face they go on fooling innocent people by pouring out some irrelevant scientific jargon in support of their trade.

Further, there is no astrology in the Vedas and the term Vedic astrology is a misnomer.

Conclusion

Many people will agree with what I have said, but would still be inclined to consult astrologers. The reason is to be found in human psychology. We meet with so many difficulties in our life, some of which are caused by our own actions and others by the actions of our fellowmen, that we look for some hopeful signs for the future. Astrological forecasts provide one such false hope and sometimes it serves as a peg on which to hang one's mistakes and responsibilities. That is why many people continue to believe astrologers, although most of their forecasts are quite ambiguous and often wrong. One can look up the forecasts published in various newspapers to verify this. People just cling to the very few coincidentally right ones of a very general nature. This phenomenon is akin to that of a person with many imaginary ailments, who visits many doctors and gets partially

cured just by a talk with them or by taking the fake medicines given to him. Thus astrologers serve the purpose of psychiatrists rather than anything else. Once we realize this, we would rather face our problems more rationally and courageously, than consult an astrologer. It would be appropriate to quote the following Sanskrit *subhashitam*:

धीमन्तो वन्द्यचरिता मन्यते पौरुषं महत् ।
अशक्ताः पौरुषं कर्तुं क्लीबा दैवमुपासते ॥

which means: Intelligent persons of exemplary character consider courageous effort to be of the greatest value, only those weak persons who are incapable of such effort put faith in destiny.

From the above discussion it becomes clear how astronomy is a science, while astrology is based on superstitious beliefs. In the language of Upanishadik philosophy, astronomy is *Vidya* and astrology is *Avidya*. Astronomy has given a truer picture of the universe around us and the place of man within it, which has made man more confident of himself. Astronomy is thus soul-lifting, which is the characteristic of *Vidya*. Astrology, on the other hand, instils in people's minds the fear of the imaginary dark forces and makes them slaves in the hands of others. Astrology thus destroys the soul of man, which puts it in the category of *Avidya*.

I would like to end with remark that the motive behind the expression of the above thoughts was nothing else but the firm belief that rational thinking should spread among our ignorant and not-so-ignorant countrymen in order to extricate them from the quagmire of superstition. In this context, the recent idea of UGC to introduce astrology as a subject in science faculty is a step in the wrong direction, which amounts to replacing truth by untruth and light by darkness. Let us hope that wiser counsels will prevail so that we can pray:

असतो मा सद्गमय । तप्तसो मा ज्योतिर्गमय ।
मृत्योर्मा अमृतं गमय ।

K. D. Abhyankar lives at 'Akashganga', 1-5-76, Vivekananda Nagar, Habsiguda st. no. 8/26, Hyderabad 500 007, India