SCIENTISTS LOOK AT ASTROLOGY

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Public interest in astrology has grown rapidly during the past decade, due in no small measure to the general misapprehension that exists in the minds of many about the standing of astrology as a "science." Astrologers have made skilful use of this confusion and, by the use of pseudo-scientific terms, have succeeded in gaining some degree of public respect. It is significant that it is a general practice on newsstands to place sound popular scientific and engineering journals on the same shelf as the astrological magazines. The confusion is not limited to the less-educated sections of our population; a few months ago one of the country's foremost public libraries gave in its monthly bulletin a list of recent acquisitions in astronomy and astrology in a section headed "Science." There is hardly an astronomer who has not been approached on more than one occasion with a request for the preparation of a horoscope.

What have scientists done to correct such misconceptions? Individuals have occasionally voiced a protest, but active concern in the spreading of astrology has generally been considered below the dignity of scientists. Yet it can hardly be denied that it is one of the functions of scientists in a democracy to inform the public about the nature and background of a current fad, such as astrology, even though to do so may be unpleasant.

Astronomically minded members of the Boston and Cambridge Branch of the American Association of Scientific Workers, aided by some of their colleagues in other parts of the country, recently formed a committee for the investigation of astrology, with B. J. Bok, chairman, and Mrs. M. W. Mayall, secretary. This committee is releasing simultaneously with this issue a first report in which a general survey is given of several problems related to astrology. We present here a summary of the report, covering such topics as the accepted techniques of astrologers, the history of astrology, the extent to which it has spread, the attitude of scientists, and the legal aspects of the problem.

I. THE HOROSCOPE AND ITS INTERPRETATION

In the technique usually employed by astrologers the horoscope of an individual at the time of his birth plays an all-important role in astrological predictions. Figs. 1 and 2 show how such a horoscope is prepared. Fig. 1 shows how the horizon and celestial meridian divide the celestial sphere for a particular location into four equal parts. Each quarter section of the sphere is again divided into three equal sections by great circles passing through the north and south points on the horizon. The twelve sections thus formed are called "houses" and the points of intersection of their boundaries with the ecliptic are called the "cusps." The exact location of the houses and the cusps in the horoscope of a given individual can be determined only if the time of birth and the longitude and latitude of the place of birth are all accurately known. Comparatively small errors in these basic data

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may have a considerable influence on the relative positions of the planets and cusps.

Fig. 2 is a conventional type of horoscope. The outer circle of the wheel or tire represents the ecliptic and its spokes mark the houses. The houses are numbered as indicated and, with the aid of an astronomical ephemeris, we can now plot the positions of the sun, moon and planets in the houses at the time of birth. The positions of the cusps in the zodiacal constellations are shown by the signs and degrees in the tire.

The interpretation of a horoscope is carried out according to a set of more or less standardized rules, but each expert has developed his or her own system. Each "house" is associated with various matters and each planet, supposedly acting as a center of force, exerts a particular influence, depending upon its position in the horoscope. The relative positions of the planets and their "aspects" play an important part in the interpretation of a horoscope. Standard treatises on astrology, such as the books of Alan Leo, give the significance of each particular aspect, at the time of birth and in later life.

Many astrologers use the system of secondary progressions as the ideal technique of prognostication, according to which each successive day after birth represents a year in the life of a subject. There is, however, considerable disagreement about the value of progressions among leading astrologers of to-day. One of them has stated flatly that "progressions are non-existent."
II. History

The earliest records of astronomy in our Western tradition are of Babylonian origin. The researches of Neugebauer have shown that astrology made its appearance only after astronomy had reached a high level of development. Judicial astrology appeared in Babylonia after 600 B.C., long after the Babylonian astronomers had developed their astronomical tables and ephemerides, calendars and lunar eclipse theory, and long after the discovery of the Saros cycle in solar eclipses.

There existed no judicial astrology during the high periods of civilization in Egypt and it was only during the Hellenistic period, when Egyptian civilization was moribund, that Babylonian astrology was introduced. The Greek astronomers did not concern themselves with astrology until Hellenistic times, when, largely through the influence of Berosus, a school for astrologers was established on the island of Cos.

Ptolemy, the last of the important Greek astronomers, was interested in astrology. Just as Ptolemy's "Almagest" became the standard reference in astronomy, so did the same author's "Tetrabiblos" become the bible of astrology for Islam and the Latin West. Our present-day astrology goes back to Ptolemy. Ptolemy, who flourished at the end of a period of about fifteen hundred years of astronomical development, was apparently the only Greek astronomer of first rank to be connected with astrology.

Astrology threatened to take complete possession of all classes of society in the
Roman world. Cato the Elder and Cicero attacked astrology, but there is no evidence that they had much influence on their contemporaries. Although there were edicts against astrologers, notably in the reigns of Augustus, Domitian and Hadrian, nevertheless their prophecies were feared and they were consulted secretly. The condition is curiously parallel to that which exists in Germany at the present time.

The Roman Catholic Church was vigorously opposed to astrology. St. Augustine, who admitted in his "Confessions" that before his conversion he had been attracted to astrology, was its most articulate and vehement opponent. The opposition to astrology by the Catholic Church has persisted through the ages. The only recorded lapses are toward the end of the middle ages, during the centuries that preceded the birth of modern natural science. The attitude of the Catholic Church is summarized in the words of a modern Catholic writer, who states: "The Catholic Church condemns astrology as a pagan superstition which by encouraging fatalism leads to the denial of Divine Providence."

With the fall of the Roman Empire, astrology came to an end in the West for about five hundred years. The return of astrology in the Latin West came with the introduction of Arabic science in the eleventh and twelfth centuries.

When the Arabs took over Greek science, they also acquired the astrology which had developed in the Hellenistic period; and in the great period of Arabic culture (A.D. 900–1100) astrology became associated with alchemy, medicine, astronomy and mathematics. It has been suggested that most of the Arabic observatories were erected primarily for astrological purposes and that their astronomical use was only incidental, but this has not been confirmed by modern historical research. The main reason for the building of these observatories, including the famous one at Bagdad, was to determine the direction toward Mecca so that the faithful could face it at the hours of prayer.

In the early medieval period, astrology was reintroduced into the Latin West principally through Arabic medicine. It had little influence during the twelfth century, but it went rapidly forward during the thirteenth century and attempted to gain recognition as a "science" by claiming that it was based on cosmological principles. The tolerance of some forms of astrology by church authorities made it possible for astrologers to establish themselves, even to holding professorships in several Italian universities.

During the late Middle Ages and the early Renaissance the opposition to astrology was vigorous, within the church and without, by mathematicians and scientists, including Oresme, Henry of Hesse, Albert of Saxony, and by humanists like Petrarhe and Pico della Mirandola. But astrology had gained such a foothold that astronomers were often forced to earn their living by astrology while carrying on their work as best they could. The case of Kepler is an outstanding example. To begin with, Kepler had great difficulty in obtaining an appointment because he was a Protestant and a Copernican but, when he did get a position as lecturer on mathematics at the poor academy at Gratz, one of his duties was the preparation of the yearly almanac containing weather predictions and astrological information. Later, when he was appointed as imperial mathematician at Prague to succeed Tycho Brahe, his financial troubles were not at an end; and in 1628, two years before his death, when his salary was three years in arrears, he took to drawing up horoscopes for the astrologer-soldier Wallenstein as a means of supporting himself and his dependents. Well might Kepler say "Mother Astron-
omy would certainly have to suffer if the daughter Astrology did not earn the bread."’ In spite of this financial necessity, Kepler kept his astronomical work free from astrology. Tycho Brahe is the only astronomer of the first rank who completely fused his astronomy and his astrology.

The religious revival accompanying the Reformation and the Roman Catholic Counter-Reformation was the most important influence in putting an end to this period of astrology. Astrology still continued to "hang on," as we know from the diatribes of Jonathan Swift, the jibes of Benjamin Franklin and the wrath of Increase Mather against individual astrologers. But its power was broken, and it did not win any marked increase in public interest until our own time.

In this historical summary several interesting points emerge: astrology has flourished in periods of high scientific development rather than in low periods, and likewise in periods when religion and philosophy were in eclipse. Also, astrology has made only practically negligible contributions to science; indeed, its prevalence has been actually harmful. In the middle ages, when students were flocking to astrology lectures, astronomers were having a hard time to earn their living from scientific work. On medicine, astrology had a strangling influence, for physicians gave up diagnosis from the symptoms and case history and relied on horoscopes to tell them why the patient was ill, what drugs to prescribe and what was the favorable time to apply the remedies. Astrology hindered the development of chemistry, because it was only after alchemy had been purged of astrology and other superstitions that chemistry grew as a separate discipline. The most striking fact is that astrology is now trying once more to gain recognition as a science by the use of methods that are reminiscent of those used with success during the middle ages.

III. PRESS, MAGAZINES AND ADVERTISING

A large percentage of the newspapers of the United States publishes either daily or monthly columns on astrology. These columns might be expected in newspapers sold to the less-educated portion of the population and in the sections of the country where superstition is widespread, but a survey shows that there are hundreds of such newspapers that carry no astrological data whatever. It is in the large centers of population that astrological columns are most prevalent. Most of the public libraries in large metropolitan areas have on file more than a hundred representative newspapers selected from all over the country. On the average about 20 per cent. of the newspapers on file carry astrological columns.

The condition in New York City is more or less typical. Only two out of
nine general newspapers published in Manhattan, the Daily News and the Journal-American, publish astrological columns; but the News alone has the largest circulation of all newspapers in the country, about 1,850,000 daily and about 3,380,000 on Sunday, according to 1939 averages. The Journal-American, with 609,000 daily, has the largest circulation among the local afternoon papers. Thus the number of readers exposed to these columns is much greater than the proportion of papers (2 out of 9) carrying them would indicate.

Some of the leading newspapers of the country are now printing astrological columns. In the eastern part of the United States the list of distinguished offenders includes the Philadelphia Inquirer, the Times-Herald of Washington, D. C., and the Boston Traveler. In the southeast the Memphis Commercial Appeal, the Charlotte Observer, and the Atlanta Constitution all carry astrological columns. The News and the Plain Dealer in Cleveland, the Ohio State Journal, Chicago's Herald and Examiner and the Daily Tribune have astrological features. In the San Francisco area two of the four large newspapers carry astrological columns and two do not. Advertisements by astrologers are regularly printed by many of the newspapers that do not refer to astrology in their news sections. Some news syndicates have occasionally released stories with astrological predictions.

The code of standard astrology, to which the great majority of the country's astrologers are supposedly adhering, states that "a precise astrological opinion can not honestly be rendered with reference to the life of an individual unless it is based upon a horoscope for the year, month, day and time of day plus correct geographical location of the place of birth of the individual . . . ." This statement alone renders all daily forecasts in newspapers void. The supposedly individual horoscopes that can be obtained by writing in and enclosing twenty-five cents are in reality frequently only copies from a relatively small number of master horoscopes.

The newspapers are by no means the only offenders. Weekly and monthly magazines with a nation-wide distribution have printed articles by leading astrologers. On May 12, 1940, the American Weekly—which claims the largest circulation of any magazine in the world—began a series of front-page articles on astrology by "Hollywood's astrologer" Norvell. It is, however, encour-
aging that Good Housekeeping has just taken a firm stand against astrology. The Federal Communications Commission has ruled astrologers off the air waves after protest by the American Astronomical Society and the American Society of Magicians.

Hollywood appears to be a veritable astrologer’s paradise, and in a quieter way Wall Street has proved a fertile field for astrological activity. Thus it is quite apparent that the influence of astrology is by no means limited to persons with salaries in lower income brackets.

Prominent among the strictly astrological magazines are: American Astrology, Horoscope, Astrology Guide, Wynn’s Astrology, World Astrology and Astro-Digest. American Astrology is said to have a circulation in excess of 100,000. The average newsstand carries at least four or five different astrological magazines. The dime stores have succumbed to the astrological craze. Modern automatic scales produce tickets with the weight of the victim on one side and astrological advice on the back.

Astrology has made considerable inroads in advertising. The Better Business Bureaus have exposed many of the schemes used by astrologers, but in spite of their effectiveness they have not succeeded in eliminating astrology as an aid to salesmanship.

IV. Legal Aspects

Many states have laws prohibiting the practice of astrology. According to American Jurisprudence (Vol. 23, p. 711) “the offense of fortune telling is generally held to be a misdemeanor. Under many statutes fortune tellers are declared to be vagrants and disorderly persons, and it has been said that such persons are without any property rights in a name or appellation, which a court of equity will protect.”

In the State of New York the legisla-ture “has signified its disbelief in human power to prophesy human events.” “Any prediction of human events for hire is prohibited by subdivision 3 of section 899 of the code of criminal procedure.” (253 N.Y.S. 836.) The availability of astrological literature in New York City is proof that these laws are not strictly enforced.

It is evident from the following quotations from the bench that the courts hold no brief for astrology:

Fortune tellers have always been classed with rogues and mountebanks and generally disreputable members of society to be summarily dealt with for the good of the community. (N. Y. v. Ashley 184 App. Div. 522; see also 4 Black. Com. 62.)

That as the statute contains no exceptions as to the method employed by defendants, any prediction of future events for hire is prohibited. (People v. Malcolm 90 Misc. Rep. 517.)

A CONFUTATION OF ASTROLOGY

HENRY MORE, LONDON, 1681, P. 63. THE WRITER, A PHYSICIAN, WAS ONE OF THE “CAMBRIDGE PLATONISTS” WHO ATTEMPTED TO FURNISH A PHILOSOPHICAL BACKGROUND FOR THE NEW SCIENCE OF THE 17TH CENTURY.
SUPPLEMENT
TO
PLACIDUS DE TITUS;
CONTAINING
THE NATIVITY OF THAT WONDERFUL PHENOMENON,
OLIVER CROMWELL.
Calculated methodically, according to the Placidian Canons,
By the Ingenious
Mr. JOHN PARTRIDGE, M.D.
TO WHICH IS PREFIXED,
PRIMUM MOBILE,
or
A COMPLETE SET OF ASTRONOMICAL TABLES,
FOR THE
EXACT CALCULATION AND DIRECTION OF NATIVITIES.

LONDON:
Printed by W. Justins, Blackfriars; and sold by Mr. Brow, Paternoster Row; Mr. Richardson, under the Royal Exchange; Mr. Mathews, in the Strand; Mr. Bissett, Piccadilly; Mr. Meiff. M. and J. Sibly, Gotwell-street; and Mr. Edmonds, Sibley, Brick-lane, Spitalfields.

FRONTISPICE OF BOOK BY JOHN PARTRIDGE, LONDON, 1790.
THE AUTHOR IS THE ASTROLOGER UPON WHOM JONATHAN SWIFT PLAYED THE FAMOUS JOKE.
"Advertising to tell fortunes by any means is prohibited in some states."
(Ruling Case Law, Perm. Suppl. p. 2254.) In addition, the "Printers' Ink Statute" makes false advertising a misdemeanor. The model statute provides that any person, firm or association that places before the public an advertisement of any sort, with intention to sell or in any wise dispose of merchandise, securities, services or anything so offered to the public, which advertisement contains any assertion, representation or statement of fact which is untrue, deceptive or misleading, shall be guilty of a misdemeanor. A study of Postal Fraud Orders shows that astrologers continually make use of the printed word in a manner that is deceptive and misleading in order to increase the consumption of their wares, a practice which this statute was designed to prevent. The Printers' Ink Statute has been "enacted into law in twenty-five states, while thirteen additional states have adopted it with modifications."
(Boston Better Business Bureau, Fact Booklet, 1938.)

Astrology is condemned by the courts, and the public can find protection against its practices through existing laws. These laws can and should be enforced, and the enactment of more effective and uniform laws should be urged.

V. The Attitudes of Scientists

Why is it that physical scientists are, apparently without exception, opposed to the teachings of astrology? Studies of the stars and planets have shown above all that the amounts of radiation from these bodies that are received on the earth are exceedingly small and that their gravitational effects are so slight as to be negligible in comparison with those from nearby objects.

Apart from the sun, the moon is the only celestial body that regularly produces a force in excess of the gravitational force produced by adjacent objects at the time of birth. Only under the most favorable conditions can the gravitational attraction of the planet Mars equal that produced by the doctor in charge of the delivery.

The apparent brightness of a star or planet will hardly be more than that of the tail-light of an airplane passing in flight overhead. The walls of hospitals and other buildings where babies are born are opaque to all known radiations from the planets.

Is it possible that there exists some as yet unknown way in which the planets can exert their influence on human affairs? Every one realizes that there are many problems, for example, those presented by hypnotism and thought transfer, that have not yet been explained in a satisfactory fashion. The case of astrology falls outside this class. It is extremely unlikely that the planets, which have a considerable degree of similarity in their general constitution, would affect human affairs according to the generally accepted scheme of astrology. For astrology as it is practiced to-day not only requires an unknown mechanism for the transfer of planetary influence, but it requires further that planets with a considerable degree of similarity should affect human affairs in an entirely dissimilar fashion.

Astrologers attach great influence to the signs of the zodiac. Because of precession of the equinoxes the apparent positions of these signs have shifted by more than twenty-five degrees during the past twenty centuries. It is impossible to understand how the stars can affect human affairs, but it is doubly difficult to suggest a mechanism to account for the influence of the zodiacal signs, which continue to change their position among the stars.

The choice of the moment of birth as the one and only critical instant seems
TEN PERIODICALS ON ASTROLOGY ARE REGULARLY CARRIED BY THIS MAGAZINE STORE IN HARVARD SQUARE WHERE, ON THEIR WAY TO CLASSES, HARVARD STUDENTS AND PROFESSORS BUY THEIR READING MATTER. SOME OF THESE ASTROLOGICAL PUBLICATIONS SELL BETTER THAN "THE ATLANTIC MONTHLY" AND "THE HARVARD GUARDIAN." NOTE THAT THE ASTROLOGICAL MAGAZINES ARE MOST PROMINENT IN THIS WINDOW.

arbitrary, and one is inclined to ask why this particular moment should be favored over the time of conception or the first exposure to fresh air?

An interpretation of the rules laid down by astrologers demands the existence of an unimaginable mechanism of action. Astrologers have not provided us with as much as a sound hypothesis that might serve as a basis for their speculations. Astrologers attempt to offset this lack of a sound working hypothesis by the introduction of terms and concepts that are unknown to physicists and astronomers. No one, with a high-school training in physics, should be fooled into accepting an explanation of the laws of astrology in which the term "cosmic vibration" figures prominently.

Scientists would feel justified in considering astrology as a legitimate field of scientific inquiry if astrologers could claim that its basic rules had been established through a rigorous study of correlations. But such a study has not been made. The rules by which astrologers interpret their horoscopes have not been derived from any known experiments or observations. Astrologers frequently claim an observational basis in the experience of forgotten generations far back in antiquity, but pure superstition can claim as sound a basis. In the cases of planets discovered in our times (Uranus, Neptune, Pluto) the evidence is conclusive that their influences on men were ascribed by the astrologers before preliminary observational tests of the influences could have been made, and even before accurate orbits could be assigned to the planets.

One might conceivably prove or disprove astrology as it is practised to-day
through a study of successes and failures of predictions based on horoscopes. Such a study would necessarily be of a statistical nature and the results should be subjected to rigorous statistical analysis. The committee has been unable to find anywhere the source material for a decisive test. Those few tests that have been carried out were based on incomplete data about the exact times of birth or the precepts of statistical analysis were not followed with sufficient care.

It is, however, possible to test for certain broad influences assigned by astrologers to specific planets and signs of the zodiac. Farnsworth has studied the zodiacal birth signs of some two thousand musicians and painters. He found that the correlation predicted by astrology—Libra is supposedly the esthetic sign—was absent. A member of the committee has made some similar tests for birth dates of scientists listed in "American Men of Science." The investigation shows that the frequency distribution of birth dates of scientists resembles very closely a random distribution and that the seasonal variations of birth dates resemble very closely those found by Huntington.

The seasonal variations in birth dates are highly significant for such tests. Huntington has shown that about 15 per cent. more people are born in January–February and September than in May–June and November. These seasonal variations are reflected in the separate frequencies for all professions, engineers, industrialists, clergymen, bankers, physicians, chemists and authors. (See Huntington’s "Season of Birth," 1938.) Now if instead of months zodiacal sun-signs are considered, the general trend does not change, whereas for astrological influences we should expect widely different correlations for the different professions.

In conclusion, we find that astrologers
have failed to suggest a workable mechanism by which the stars and planets can exert their influence on human destiny. The doctrine of astrology can not claim that it is in any way supported by statistical evidence from observed correlations, and until such correlations are established scientists can not accept the precepts of astrology.

VI. Psychologists State Their Views on Astrology

The committee for the study of astrology has been fortunate in having the cooperation of some leading psychologists. At the request of Professor G. W. Allport, the executive council of the Society for Psychological Study of Social Issues authorized the release by the committee of a statement entitled: "Psychologists State Their Views on Astrology." We are glad to present this statement without change.

Psychologists find no evidence that astrology is of any value whatsoever as an indicator of past, present, or future trends in one's personal life or in one's destiny. Nor is there the slightest ground for believing that social events can be foretold by divinations of the stars. The Society for the Psychological Study of Social Issues therefore deplores the faith of a considerable section of the American public in a magical practice that has no shred of justification in scientific fact.

The principal reason why people turn to astrology and to kindred superstitions is that they lack in their own lives the resources necessary to solve serious personal problems confronting them. Feeling blocked and bewildered they yield to the pleasant suggestion that a golden key is at hand—a simple solution—an ever-present help in time of trouble. This belief is more readily accepted in times of disruption and crisis when the individual's normal safeguards against gullibility are broken down. When moral habits are weakened by depression or war, bewilderment increases, self-reliance is lessened, and belief in the occult increases.

Faith in astrology or in any other occult practice is harmful in so far as it encourages an unwholesome flight from the persistent problems of real life. Although it is human enough to try to escape from the effort involved in hard thinking and to evade taking responsibility for one's own acts, it does no good to turn to magic and mystery in order to escape misery. Other solutions must be found by people who suffer from the frustrations of poverty, from grief at the death of a loved one, or from fear of economic or personal insecurity.

By offering the public the horoscope as a substitute for honest and sustained thinking, astrologers have been guilty of playing upon the human tendency to take easy rather than difficult paths. Astrologers have done this in spite of the fact that science has denied their claims and in spite of laws in some states forbidding the prophecies of astrology as fraudulent. It is against public interests for astrologers to spread their counsels of flight from reality.

It is unfortunate that in the minds of many people astrology is confused with true science. The result of this confusion is to prevent these people from developing truly scientific habits of thought that would help them understand the natural, social, and psychological factors that are actually influencing their destinies. It is, of course, true that science itself is a long way from a final solution to the social and psychological problems that perplex mankind; but its accomplishments to date clearly indicate that men's destinies are shaped by their own actions in this world. The heavenly bodies may safely be left out of account. Our fates rest not in our stars but in ourselves.