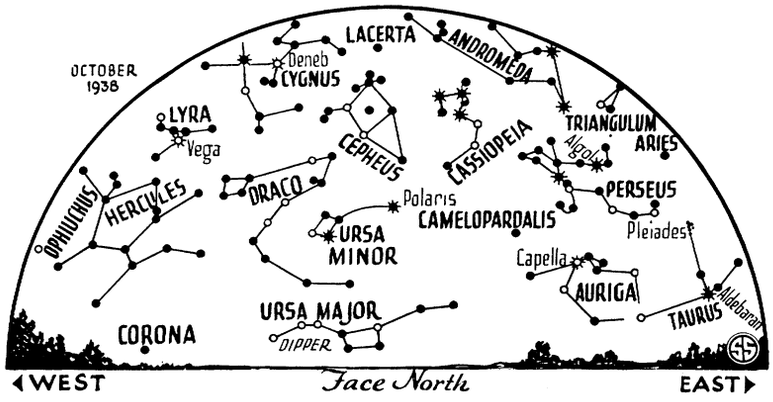

ery. Accordingly, history's verdict gives Galileo undisputed credit.

The following years brought the discovery of eight moons of Saturn, four of Uranus, two of Mars, and one of Neptune, but Jupiter had to remain content with four until the building of the Lick Observatory in California. In 1892, Dr. Edward E. Barnard took a photograph with one of that institution's great telescopes, which revealed the fifth satellite. No name has ever been given to this little body, which is much smaller than the four of Galileo, and is only about half as far from the planet as Io. Its magnitude is 13, so that a good-sized telescope is needed to see it.

In the winter of 1904-5, Lick Observatory again contributed, when Dr. C. D. Perrine found two more, known merely as six and seven. Their magnitudes are 14 and 16, still fainter than Barnard's No. 5. In 1908, England scored for the first time, when Dr. P. J. Melotte, at the Royal Observatory, Greenwich, found No. 8, of magnitude 17.

The eighth proved very difficult to see, and satisfactory observations of it were very meager. In 1914, Seth B. Nicholson, a graduate student at the University of California, was doing work for his doctor's degree at the Lick Observatory, and decided to make the eighth satellite the subject of his thesis. Therefore, he had to photograph it, and when he did he found a strange object on one of the plates. This turned out to be satellite No. 9, of magnitude 19. The following year he received his doctorate, and joined the staff of the Mt. Wilson Observatory.

There, the sun, and studies of the heat radiation of the stars and planets, have engaged his attention for most of the time. But during the past summer he returned to his old love, Jupiter, and made a survey of the planet and its moons. The eighth satellite, elusive as ever, had been "lost" for many years, but he found it again at the end of July, using the 100-inch telescope, the world's largest.

Then, as he studied his plates, he found several strange objects. One turned out to be an asteroid, one of the family of tiny planets moving between Mars and Jupiter. But two others proved to be new Jovian satellites, numbers 10 and 11! They also are of the 19th magnitude, so that only a very few of the world's telescopes are capable of showing them. There is no doubt but that they are real moons. Thus, Dr. Nicholson's score is now only one behind that of Galileo, while Jupiter easily leads in the size of its retinue.

As for our own moon, the table below indicates its phases. Twice this month it will recede from the earth to its greatest distance, when we say that it is at apogee. On Oct. 2, at 6:00 a. m., E.S.T., it will be 251,200 miles away, and on Oct. 30, at 2:00 a. m., E.S.T., it will be at a distance of 251,300 miles. But on the 16th, at 3:00 a. m., it will be at perigee, only 230,000 miles distant. On the night of Oct. 30, also, persons throughout the United States, except in the western part, will see it hide, or "occult," the third magnitude star beta Capricorni. It will then be almost at first quarter. At Washington, the star will pass behind the bright edge of the moon at 11:53 p. m., E.S.T., while it will emerge from the dark edge at 1:13 a. m., E.S.T., on the 31st. For other parts of the country, the times will be a little different. A telescope, or a pair of binoculars, will help reveal the star when close to the moon.

Phases of the Moon

		E.S.T.
First quarter	Oct. 1	6:45 a. m.
Full	Oct. 9	4:37 a. m.
Last quarter	Oct. 16	4:24 a. m.
New	Oct. 23	3:42 a. m.
First quarter	Oct. 31	2:45 a. m.

Science News Letter, September 24, 1938

PSYCHOLOGY

Expert Asks Why Reading Should Be Taught to All

WHY learn to read?

Modern invention is fast minimizing the need for ability to recognize the printed word. The radio has done away with need for reading the newspapers; even the comic strip is presented over the air. Fiction comes to you in sound movies.

You can now buy excellent magazines containing whole stories in pictures. Even if you are a historian, important events are recorded for you in motion pictures. The voices of great men may bring their messages to you on sound film or phonograph records.

Even the letters of friendship or business may soon be outdated by mailable dictating machine records on which the sender can speak directly to his correspondent.

Seriously, it is proposed by Dr. Arthur Lichtenstein, of the Johns Hopkins University, who has had the problem of teaching reading to those who cannot learn, that we modify the school curriculum so as to lighten the burden for those lacking in literary aptitude.

The story of Rae is told by Dr. Lichtenstein in *School and Society,* where this revolutionary proposal is made.

Rae was a "nice, friendly boy, making every effort to succeed, and a great help around the home."

Normal IQ

Rae's troubles were due to the fact that at ten years he was unable to pass the second grade reading test. Despite this handicap his intelligence was normal. Every effort was made to teach him to read.

Four years later his IQ had dropped 15 points. He had gained 18 months in mental age in the four years and in silent reading he had lost two months.

"The time spent in attempting to make a reader of Rae was wasted," comments Dr. Lichtenstein. "Fortunately, no greater harm to his personality appeared to result than the development of a marked inferiority feeling and dislike and apprehension in the presence of a reading situation.

"Had reading been relegated to a minor place in his program instead of the all-powerful bugbear it became, he would be just as well off educationally and far better off from a mental hygiene point of view."

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