THE *Rivista Geografica Italiana*, No. 6 of 1908, contains a short note on the remarkable eruption of Etna on April 29 last. This was preceded by violent earthquakes, and accompanied by the opening of a fracture of more than a kilometre in length and from 20 to 50 metres in breadth. Several parasitic cones of small size were formed along it, and about 500,000 cubic metres of lava poured out, but the fissure was only partially obscured by erupted material, and remained conspicuous after the eruption had ceased. Although this eruption was violent while it lasted, and although the interval separating it from the next preceding eruption was more than fifteen years, or about two and a half times the average during the last 150 years, the eruption was of very short duration, commencing at 5.20 a.m. on April 29 and ceasing at 5.40 p.m. on April 30, but practically lasting for only about seventeen hours.

THE report of the Meteorological Committee for the year ending March 31 last contains much useful reading for those interested in the development of meteorological science, and shows that great efforts are being made both from practical and theoretical points of view. Many useful publications have been issued during the year, to some of which we have already referred; among those still in the press we may specially mention:—(1) meteorological results for the western portion of the Atlantic anticyclone, by Dr. R. H. Scott; (2) seasons in the British Isles since 1878; and (3) summary of hourly values at four observatories, 1879–1908. The most important point to be noted in connection with the periodical publications is the revision of the form of the monthly weather report, which gives summaries from all stations in connection with the office, either directly or through the meteorological societies and other bodies, and includes a rainfall map contributed by Dr. H. R. Mill. This change is based on the principle that the value of the observations is much enhanced by prompt publication, and now extends to all branches of the work; *e.g.* the marine department, under the able superintendence of Commander Hepworth, issues elaborate monthly pilot charts for the Atlantic and Indian Oceans, which include the latest intelligence of use to seamen received by cable from the Canadian and Indian Meteorological Services. In view of the importance of a homogeneous system of weather telegraphy in western Europe, the committee has changed the hour of reports from 8h. to 7h. a.m.; the additional expense of the earlier opening of the telegraph offices gives rise, however, to a serious question of ways and means. The use of wireless telegrams and the investigation of the upper air are among the many other important matters engaging the earnest attention of the committee.

THE June number of *Terrestrial Magnetism and Atmospheric Electricity* contains a short article on the work of the magnetic survey yacht *Galilee* from the pen of the director, Dr. L. A. Bauer. During the three years' voyages of the *Galilee* a complete magnetic survey of the Pacific Ocean was made with scarcely a hitch in the programme originally sketched out for it. The experience gained on board has led to the conclusion that for future work a vessel must be specially constructed, and the Carnegie Institution has undertaken to defray the cost of a new wooden sailing vessel, the *Carnegie*, 155 feet long, with auxiliary power (125 horse-power) provided by a gas engine, built, so far as possible, of non-magnetic materials, so that the outstanding magnetic effect of the ship will be less than the errors of observation. It is hoped that the ship will be ready next year, when a survey of the Atlantic will be commenced.

IN a further article in the same magazine Dr. Bauer points out that the recent attempts to represent the magnetic state of the earth by means of spherical harmonics have not led to results of which any practical use can be made, owing to the wide divergence between the calculated and the observed values for any point. This he puts down to the distribution of areas of irregularity of varied amounts and extents over the earth, and the difficulty of representing their effects analytically without calculating a prohibitive number of terms. He concludes that the time has come to halt in our attempts to calculate more terms, and to fix on a small number as representing the principal features of the magnetic state of the earth with sufficient accuracy, and to deal with each of the residuals separately.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN SEPTEMBER:—

Sept. 7. Venus. Illuminated portion of disc = 0·431; 27th = 0·568.
9. 7h. 56m. to 8h. 56m. Moon occults τ^2 Aquarii (mag. 4·3).
10. 16h. 9m. to 16h. 56m. Moon occults 30 Piscium (mag. 4·7).
11. 7h. 45m. Saturn in conjunction with Moon (Saturn 2° 33′ N.).
13. 11h. 42m. Minimum of Algol (β Persei).
14. 9h. Venus at greatest elongation (46° 2′ W.).
15. 13h. 37m. to 14h. 40m. Moon occults ϵ Tauri (mag 3·7).
,, Saturn. Outer minor axis of outer ring = 5″·32.
16. 8h. 31m. Minimum of Algol (β Persei).
,, 16h. 12m. to 17h. 29m. Moon occults o Tauri (mag. 4·8).
20. 19h. Venus in conjunction with Moon (Venus 5° 0′ S.).
22. 12h. 19m. Jupiter in conjunction with Moon (Jupiter 3° 45′ S.).
,, 22h. 59m. Sun enters Libra; Autumn commences.
29. 19h. Saturn in opposition to the Sun.

OBSERVATION OF PHŒBE, SATURN'S NINTH SATELLITE.—From a note in No. 4270 of the *Astronomische Nachrichten* (p. 362, August 21) we learn that photographs of Saturn's ninth satellite, Phœbe, were obtained at Greenwich, with the 30-inch reflector, on July 31, August 1, 2, and 3. Provisional measures of the position-angle and distance of the satellite, about 63° and 39′ respectively, are given for each date. On August 3 the satellite was at, or very near, eastern elongation, so that these positions, in combination with those determined at western elongation about October 30, 1907, will furnish valuable data for the determination of the mass of Saturn.

THE PARALLAX OF 61 CYGNI.—From meridian observations, made with the small meridian-circle of the Astronomical Institute of Heidelberg Observatory, Herr Giorgio Abetti has determined the parallax of the well-known double star 61 Cygni, and publishes a preliminary communication of his results in No. 4270 of the *Astronomische Nachrichten*. These preliminary results give a somewhat lower value than previous determinations, the respective parallaxes of the preceding and following components being $+0''.24 \pm 0''.05$ and $+0''.22 \pm 0''.05$.

PROMINENCES AT THE SUN'S POLES.—In No. 7, vol. xxxvii., of the *Memorie della Società degli Spettroscopisti Italiani* (p. 107) Father Fenyi discusses, at some length, the occurrence and appearance of large prominences near the solar poles. The discussion embraces the question as to the epoch of the sun-spot period at which such prominences are most frequently seen, and it is shown that their maximum takes place some months after the sun-spot maximum. Among other conclusions, Father Fenyi finds that there is a periodical sharp maximum to which it is desirable that further attention should be paid. He also shows that the estimation of the heliographic latitude of the sun's polar cap from the continuous observations of the positions of prominences in regard to the limb is not

satisfactory, as a prominence 60″ in height will remain visible and simply appear to oscillate during a whole rotation. It is suggested, however, that satisfactory determinations of the polar rotation in high latitudes could be made by observing these prominences, whereas the sun-spot observation method cannot be applied and the spectroscopic method is unsatisfactory.

OBSERVATIONS OF VARIABLE STARS.—The periods and light-changes of several variable stars are discussed in Bulletins Nos. 15 and 16 of the Laws Observatory, University of Missouri. No. 15 is devoted to the discussion of 395 observations of the Algol variable RW Monocerotis (24, 1907) made during the period October, 1907, to April, 1908, and a period of 1·9 d. is deduced, the light-changes taking place in 7h. 34m.

The observations of the long-period Algol variable RZ Ophiuchi are discussed in Bulletin No. 16, and a period of 261·8 d. is found to satisfy them. The other variables, for which only preliminary announcements are given, are RS Boötis, 43.1907 Draconis, 44.1907 Ursæ Majoris, and SW Andromedæ (5, 1907).

THE INFLUENCE OF THE EARTH'S ROTATION ON THE COURSES OF RIVERS.—In a paper published in the Transactions of the New Zealand Institute (vol. xxxix., pp. 207–213) Dr. F. W. Hilgendorf discusses some very careful observations made by himself of the possible influence of the earth's rotation on the course of the rivers which flow over the Canterbury Plains, New Zealand. These plains, being of a very homogeneous structure, afford an excellent site for the testing of "Ferrel's law" concerning the deflecting force of the earth's rotation, and Dr. Hilgendorf succeeds in showing that this deflecting force has, in all probability, been an effective factor in the modification of the banks of the rivers which flow in a N.E.–S.W. direction across the Canterbury plains.

A POSSIBLY UNDISCOVERED FORM OF SOLAR RADIATION.—In No. 5 of the *Comptes rendus* (p. 318, vol. cxlvii., August 3) M. E. Durand-Gréville discussed the secondary twilight and dawn which are observed in the Alps and at other great altitudes, and suggested that reflection of the sunlight from the temperature-reversing layer of the atmosphere, discovered by M. Teisserenc de Bort, might account for these phenomena; but in No. 7 of the *Comptes rendus* (August 17) M. Deslandres offers an alternative suggestion. It is that, in addition to the solar radiations which traverse our atmosphere and those ultra-violet radiations which are known to be absorbed by it, there may be others, in the further ultra-violet, to which the atmosphere may be transparent or which are able to produce a phosphorescence which would account for the secondary illumination of the mountain sides, &c., after the passing of the ordinary twilight. He further suggests a method whereby the existence of such radiations may be demonstrated.

WELSH ASTRONOMICAL TRADITIONS.

I HAVE put together some notes, compiled out of the flotsam and jetsam of Welsh tradition bearing on the continuity of the astronomy of the stone monuments, with the view of finding out how far such traditional materials will enable us to reconstruct, with the aid of the testimony of the monuments themselves, the story of the megalithic period in Britain, the period or periods of the avenue, circle, and cromlech.

The Testimony of the Bards.

I have already in these columns claimed for the Gorsedd a continuity of bardic tradition of the greatest value. A more careful study of isolated bardic utterances shows us the bard-astronomer at work in the same capacity as the priest-astronomer of the megalithic period.

There are two utterances attributed to the bard Taliesin which strongly suggest the use of stars as heralds of sunrise or as clock stars. In such utterances the note of antiquity is the bard's assumption of exclusive knowledge of astronomical phenomena. He challenges others to tell him "what hour in the small of the day (meinddydd) that Cwy was born?" Who Cwy was I know not, but the expression should be remembered in discussing Welsh solar heroes. Again, the bard speaks contemptuously of some who "do not know the point of separation between dewaint (the midnight watch, 1 to 3) and gwawr (dawn)."

It should be remembered that the body of tradition we are discussing was once common to the inhabitants of Wales as Goidelic or Irish before it became Welsh. The Irish bard Amairgen speaks still more definitely of his indispensableness:—

> "Who foretells the ages of the moon (but I)?
> Who teaches the spot where the sun rests (but I)?"

The sun rests at the solstice. People from the earliest times would have noted as much. But the spot—who but the bard knew the solstitial alignment? The words take us back not only to a period before the popular use of a calendar, but also to the time when the almanac for the year was fixed by direct observation of the solstice sun on the horizon; not that observation of the solstice along the horizon is in itself a proof of antiquity, for a farmer in the parish from which I write still uses that ancient method; but what is curious is the bard's assumption of exclusive credit for the information.

The leading astronomers of bardic tradition are mythical personages. I have elsewhere shown how the leading saints of Wales were regarded as astronomers. But the leading astronomers were the associates of gods, if not gods themselves. "The three sublime astronomers of the Isle of Britain:—Idris the Giant, Gwydion the son of Don, and Gwyn the son of Nudd. So great was their knowledge of the stars, and of their nature and situation, that they could foretell whatever might be desired to be known to the day of doom."

Idris is commemorated in the name of the Merionethshire mountain, Cadair Idris (Idris's Chair). The Milky Way is called Caer Gwydion (Gwydion's Encampment). His mother was a goddess. Gwyn, the son of Nudd, is spoken of as the King of the Fairies. His father seems to have been the Welsh Neptune.

So the remotest antiquity and the place of highest importance is given to astronomy in Welsh or British tradition.

Holed Stones.

These are rather rare monuments. I have notes of some in Wales, and I expect, with the growth of interest in the astronomical study of such monuments, that more will be brought to light. As Cornish and Scottish tradition shows, such stones were used as charms, a fact which largely explains their present rarity.

I have not been able to find out the origin of a familiar Cardiganshire expression. When one makes a vain attempt to make another person understand or heed what is told him, the speaker or a friend makes the remark, "You might as well say Carreg a Thwll (Stone and Hole) to him." This cryptical Welsh expression is the name of the famous holed stone of Cornwall, Men-an-Tol, so that the Welsh colloquial Carreg a Thwll may reasonably be supposed to be the holed stone of the megalithic period.

A holed stone figures prominently in one of our oldest written tales, namely, the tale of Math, son of Mathonwy. The stone was on the bank of the river Cynvael in Ardudwy, a part of Merionethshire, and it was called Llech Gronw, "the Stone of Gronw or Goronwy." Gronw loved, and was loved by, the wife of Llew Llew Gyffes, "Llew of the Un-erring Hand." The woman induced her husband to tell her how he might be slain, pretending the most affectionate concern in such an event. He told her gladly, "Not easily can I be slain, except by a wound. And the spear wherewith I am struck must be a year in the forming. And nothing must be done towards it except during the sacrifice on Sundays. I cannot be slain within a house, nor without. I cannot be slain on horseback nor on foot." "Verily," said she, "in what manner then canst thou be slain?" "I will tell thee," said he. "By making a bath for me by the side of the river, and by putting a roof over the cauldron, and thatching it well and tightly, and bringing a buck, and putting it besides the cauldron. Then if I place one foot on the buck's back, and the other on the edge of the cauldron, whosoever strikes me thus will cause my death."

The woman's paramour toiled for a whole year making