

steep, is positive proof that the non-existence of extensive reefs cannot in such places be owing to any deleterious influences arising from volcanic action, but must be on account of the depth of water on the coast.

S. J. WHITMER

Upolu, Samoa

Mirage on Snowdon

ON Monday, July 12, I, with a party, ascended Snowdon. The atmosphere was clear until we had reached within half a mile of the summit, when a light cloud rising stealthily from amongst the southern peaks enveloped it. Drifting towards us, when very near, the cloud dropped over the eastern shoulder of the mountain just where it dips towards Capel Curig. As we stood watching, great was our surprise and delight as we beheld painted upon it, not the *arc-en-ciel* with which we are familiar, but a complete and brilliant prismatic circle, apparently about thirty feet in diameter, in the very centre of which we ourselves were depicted, the image being somewhat enlarged but clearly defined; as we arranged the party in groups, or bowed to each other, every form and movement was faithfully reproduced in the picture. It was now about 8 o'clock, with the sun nearly in a line with us. Our guide, who had made some hundreds of ascents, had never witnessed such a sight before.

H. J. WETENHALL

Fordfield, Cambridge

OUR ASTRONOMICAL COLUMN

KEPLER'S NOVA, 1604.—We learn from Prof. Winnecke that, in consequence of the remarks upon this star which appeared in *NATURE*, vol. xi. p. 249, he has lately examined the neighbourhood, and, in addition to the star of 11.12th magnitude there mentioned—the position of which for 1855.0 he finds to be R.A. 17h. 22m. 46s., N.P.D. 111° 23'6"—he found one of 12th magnitude in R.A. 17h. 21m. 49.3s., N.P.D. 111° 19'3". This star agrees almost precisely in place with the 10th magnitude marked upon No. 52 of Chacornac's charts, though not at present of that brightness; but we are able to state that in August 1871 and June 1872 nothing was visible in this position in a telescope which would show stars to 13.14 magnitude in Winnecke's scale. It will be desirable to watch this small star closely, as it is quite possible it might be identical with Kepler's famous star, the observed place of which is not so accurately known as in the case of the similar object observed by Tycho Brahe in 1572. Prof. Winnecke, however, suggests that, as the star marked by Chacornac is just upon the margin of his map, where some distortion exists, it might possibly be identical with No. 16,872 of Oeltzen's Argelander, a star estimated 8.9 in the Bonn Zones; still the place of the 12th magnitude agrees much more closely with that of Chacornac's 10th, read off from his chart as nearly as the circumstances permit. It may be well to compare the fainter star found by Prof. Winnecke, from time to time with the 11.12th close at hand, and easily identified if the instrument be set for Argelander's star, which may be considered a bright 9th magnitude.

THE BINARY STAR 4 AQUARI.—If good measures of this star are practicable during the present season, an idea of the form of the orbit may perhaps be obtained. Dawes's series of epochs will be of material service in this respect; without them, doubt might have been occasioned by the two discordant epochs of Mädler, which may have been owing to distorted images at low altitude. The object is certainly one of considerable difficulty, and really trustworthy measures are perhaps only to be expected from practised observers in command of instruments of excellent definition. In Barclay's second catalogue it is described as just elongated in the direction 144°, with power 450 on the 10-inch refractor at Leyton, at the epoch 1865.74; this angle shows direct progress, very much in accordance with Dawes's measures. Possibly the companion may now be found nearly due south of the primary.

THE NEBULÆ.—Prof. Schönfeld has published in Part II. of "Astronomische Beobachtungen zu Mannheim"—Carlsruhe, 1875—a continuation of the valuable series of observations commenced by him in 1860, for accurate determination of the positions of a selected list of nebulae. In this second part we have the places of 336 of these objects, obtained by direct reference to stars, which, as in the case of those employed in fixing the positions of the nebulae included in the first part (Mannheim, 1862), have been meridionally determined at Bonn by the late Prof. Argelander; the mean places are found in Vol. vi. of the Bonn Observations. Schönfeld's epoch is as before, 1865.0, for which year the precessions are computed with Bessel's constants, still preferred by many of the German astronomers. The differences from Schultz's Preliminary Catalogue are shown, and are generally small. As one result of more recent observations, it is remarked by Schönfeld that a sensible proper motion of the great nebula in Andromedæ, which appeared to be indicated by a comparison of Flamsteed's observations with those of D'Agelet and Lalande, is not confirmed.

Prof. Adams, in his last address as President of the Royal Astronomical Society, remarks upon the great value attaching to Schönfeld's micrometrical observations of the nebulae, of which we have here the continuation.

ENCKE'S COMET.—Mr. J. Tebbutt of Windsor, New South Wales, reports his discovery of a comet, which he supposed to be Encke's, on the morning of May 7th, in the constellation Cetus. It is, we believe, the second occasion upon which this able amateur astronomer has detected this comet, before the arrival of an ephemeris from Europe, and no doubt in the present case his independent discovery, which he communicated telegraphically to the Government astronomers at Sydney and Melbourne, will lead to a number of observations for position at the Australian observatories, which might have been otherwise lost. The search for comets without the aid of an ephemeris is hardly an occupation which can be expected in a public observatory, where time is valuable for routine work—hence an argument for the early and general publication of ephemerides—and an inducement for some amateurs, especially in southern latitudes where a great necessity for systematic sweeping of the sky in search of comets appears still to exist, to so employ their leisure time. One at least of the lost comets of short period, is far more likely to be recovered in the southern hemisphere, than in these latitudes.

THE ARGENTINE OBSERVATORY.—Dr. Gould has just circulated in two small pamphlets, in English, the annual Report for 1874 of proceedings at the Observatory of Cordoba, and at the Meteorological Office, which has also been organised by this distinguished astronomer. With regard to astronomical work, the observations for the "Uranometry" are completed, as already mentioned in this column. The charts will be thirteen in number, including the whole of the southern heavens as well as the first ten degrees north of the equator, and about 8,500 stars will be represented upon them, of which about nine-tenths have southern declination. A catalogue will accompany the Atlas, as with the works of Argelander, Heis, and Behrmann. The zone-work was in a very forward state, 82,537 stars having been observed, and with the exception of an insignificant number of zones for which it might be necessary to wait till a later period of the year, Dr. Gould expected to complete this laborious undertaking by the end of last month. The third of the principal sub-divisions of work at Cordoba, the formation of what is called "the smaller Catalogue" is also well advanced: the catalogue is intended to consist of nearly 5,000 of the brighter stars of the southern heavens, each one observed not less than four times; in the year 1874, 12,500 observations of 3,600 different stars were made, the greater number during Dr. Gould's visit to his native city, a sufficient proof that he has been

zealously supported in the extensive plans of observation arranged by him, by the other officers of the establishment. The great comet of 1874 was followed with the large refractor of the Argentine Observatory (which, Dr. Gould informs us, is an 11-inch by Fitz, of New York) until the 18th of October, the comet having been first seen there, in the morning twilight on July 27; at the last observation it was within about 12° of the South Pole. [Our last remarks on this comet should have been headed Comet, 1874 (III.).]

THE LATE W. J. HENWOOD, F.R.S.

THIS distinguished mining geologist, who died at Penzance last week, in his seventy-first year, was originally a clerk in the employment of Messrs. Fox, of Falmouth, to whose counsel he was considerably indebted in his early scientific work. By very great industry and careful observation he acquired an unsurpassed knowledge of the mineral deposits of Cornwall and Devon, and after fulfilling a succession of important mining appointments, he became Assay Master of tin to the Duchy of Cornwall. This post being abolished, Mr. Henwood's great experience was utilised in reporting upon and developing a number of mining districts in South America, Canada, &c.; and after the cessation of his travels, he lived at Penzance in comparative retirement. His great works are the fifth and eighth volumes of the "Transactions of the Royal Geological Society of Cornwall," devoted respectively to the metalliferous deposits of Cornwall and Devon, and to those of the foreign countries he had visited. But his scientific writings, besides these, were very numerous; a list of them occupies seven columns in the "Bibliotheca Cornubiensis."

As a scientific man Mr. Henwood was characterised by indefatigable labour, great caution, love of accuracy, and moderation of expression. In his publications he scarcely ever mentions a fact of any kind which had not come under his own experience, without giving the authority for it. Thus many of his writings are marvels of copious reference. He persisted in doing everything with this extraordinary amount of labour and care up to the last, notwithstanding that he suffered for many years from a very painful heart-disease. His scientific work ceased only with his death. So long as he could sustain even an hour's intellectual effort during the day, that was devoted to the arrangement of his stores of facts and observations. I believe that scarcely one of his cherished objects in this respect remains unfulfilled.

Mr. Henwood's address to the Royal Institution of Cornwall in 1871, extending, with references, to sixty-five pages, affords ample evidence of the value of his observations and of his scientific ability. It includes the most admirable and complete compendious account of the mode of occurrence of metalliferous deposits in Cornwall which has yet appeared, and is characterised by that absence of theoretical assumption which specially marked him as an observer. The orderly arrangement of accurately-observed facts was his object; theorising he had little affection for; suspended judgment on unproved theories was his consistent attitude.

In personal character Mr. Henwood won the high regard of all who knew him intimately. His acquaintance with men and manners was so great and varied, his memory so retentive, and his conversational style so simple and lucid, that to talk with him was one of the most delightful and instructive of intellectual recreations. His estimate of his own labours and merits was unaffectionately modest, although he would resist, if possible, any unfair representation of his work.

In the spring of the present year the Murchison Medal of the Geological Society was awarded to Mr. Henwood. An extract from a letter written by him to a friend on this subject may fitly close this notice: "Mr.

Evans's far too flattering estimate of my poor labours was most kindly intended. Although the distinction cannot but afford me pleasure, this is as nothing compared with the kind, and even affectionate, congratulations of yourself and my other friends. All these I carefully preserve, as they will show what I have done far better (though in an undeservedly favourable light) than the mere official record."

G. T. BETTANY

THE INTERNATIONAL CONGRESS AND EXHIBITION OF GEOGRAPHY

THE Geographical Exhibition continues to have increasing success, although the price of admission has been raised, except for schools, for which the original price, a penny a head, has been kept, and the galleries are crowded with children under the guidance of their teachers. It is said that all the soldiers of the garrison of Paris will be marched through the galleries under the guidance of their officers, when the Congress is over. The Exhibition will be prolonged to the end of the month.

Several improvements have been made in the English section since our last notice. Examples of the several maps published by the Ordnance Survey have been exhibited from an inch to ten feet per mile. Although completed only at a late period, the exhibition of the Geological Survey of Great Britain has been very successful; an immense number of maps have been exhibited, and are said to be the finest in the whole exhibition building. We might refer to a number of other exhibits honourable to English enterprise, but we must confess that Russia has carried the day, not on account of her private enterprise, but in consequence of the strenuous action of the Government. It is very likely that St. Petersburg will be chosen by common consent for the seat of the next geographical exhibition.

M. Glæsener, member of the Royal Academy of Sciences of Belgium, exhibits a chronograph available for registering the flight of projectiles as well as for recording astronomical observations for the determination of longitude. The cylinder can be put into rotation at the rate of four turns in a second or one turn in thirty seconds, according to the order of phenomena. It requires only the power of Daniell cells and ordinary magnet needles, without any electrical spark. It is very cheap, compact, and easy to set in operation.

The Rysseberghe self-registering meteorograph has been admitted, as we have already noticed, to supersede any similar instrument in existence. Copper plates engraved automatically can be used in printing, having turned into relief by the processes already described.

M. Lynström, of the University of Helsingfors, has sent to the Geographical Exhibition an interesting instrument invented by him to demonstrate that auroræ are produced by electrical currents passing through the atmosphere in the polar regions. The apparatus is put daily into operation by M. Mohn, the director of the Meteorological service of Sweden, and it was constructed at the expense of Mr. Oscar Dickson, the Gottenburg merchant, who has fitted out the Swedish Polar Expedition under Prof. Nordenskiöld. Our illustration will give an idea of the apparatus.

A is an electrical machine, the negative pole being connected with a copper sphere and the positive with the earth.

S S' are of ebonite as well as R R' d d', so that B is quite isolated as the earth in the space. B is surrounded by the atmosphere. d' d' d' d' d' are a series of Geissler tubes with copper ends above and below. All the upper ends are connected with a wire which goes to the earth, consequently a current runs in the direction of the arrows through the air, and the Geissler tubes become luminous when the electrical machine is set into operation.