THE MEASUREMENT OF STELLAR DIAMETERS.—When the objective of a telescope is covered with a screen having two slits in it, the image of the object under observation takes the form of a series of fringes lying in the direction of the slits; and every one with an elementary knowledge of physics knows that this appearance is due to the interference of the beams of light traversing the instrument. Fizeau appears to have been the first to point out that the size of the fringes depends upon the angular dimensions of the luminous source producing them, and that this fact might be utilised to determine stellar diameters. The means by which Prof. Michelson has applied the principle to the measurement of the diameters of Jupiter's satellites has already been described in these columns (vol. xlv. p. 160); but the subject is so important that we give here the gist of a discussion of the theory of the matter, contributed by M. Maurice Hamy to the number of the *Bulletin Astronomique* just issued. By means of Prof. Michelson's interferential refractometer—an instrument with a life of usefulness before it—it is possible to measure diameters down to $0''{\cdot}01$, that is, to the angle which the sun would subtend if it were removed to the distance of α Centauri. In fact, there is little doubt that the diameters of stars are measurable by this means. All that is necessary theoretically is to cover the object glass of the telescope with a screen having two rectangular, parallel slits, equal and of variable width. The interference fringes produced at the focus of the instrument are made to disappear by separating the slits, and when the fringes corresponding to light of a wavelength represented by λ have vanished, the distance (l) between the centres of the slits must be measured. The exact formula which enables the diameter (ϵ) of the object under examination to be determined from these data is, according to M. Hamy,

$$\epsilon = 1''{\cdot}22\,\frac{\lambda}{l \sin 1''}$$

There are, of course, a few difficulties in the way of perfectly realising the theory, but they are being overcome, and it is not too much to say that the interferential refractometer will add very considerably to astronomical knowledge before the end of this century. It would be interesting to measure the diameters of Algol, and some of the spectroscopic binaries, and compare the results with those deduced from observations of motion in the line of sight.

THE MOON AND WEATHER.—The solitary observable effect of the moon on our atmosphere was believed by Sir J. Herschel to be exhibited in the tendency of clouds to disappear under a Full Moon. He attributed this to the heat radiated from the lunar surface. Humboldt speaks of this connection as well-known in South America, and Arago indirectly supports the theory by stating that more rain falls about the time of New Moon than at the time of Full Moon; the former period being cloudy, and the latter cloudless, according to theory. With the idea of obtaining information upon the matter, the Rev. S. J. Johnson has examined the state of the sky at moonrise and at midnight on the day of Full Moon only for the last fifteen years. His results were communicated to the Royal Astronomical Society on January 12, and they confirm the opinion now held by almost every astronomer, viz. that the Full Moon has no effect in breaking up clouds.

GEOGRAPHICAL NOTES.

MRS. BISHOP (Miss Isabella Bird) has set out *via* Canada for Korea, where she intends to spend some time studying the country, and whence she may afterwards make a journey into Manchuria.

THREE Christmas lectures to young people by Mr. Douglas W. Freshfield, were arranged by the Royal Geographical Society, and were delivered in the second week of January to an interested audience. The subject was mountain-study as a branch of geography, and the lectures were illustrated by a large collection of extremely fine photographic views of the Alps and Caucasus.

MR. H. J. MACKINDER commenced the second series of his lectures on the relation between geography and history, in pursuance of the Royal Geographical Society's Educational Scheme, on January 11, in the theatre of the Royal United Service Institution, Whitehall Yard. The lecture was introductory to the present course, which will be continued weekly, and consisted of an epitome of last year's lectures, showing that physical and geographical conditions largely determine the order of history and the movements of peoples. The remaining lectures will deal with a series of concrete examples, focussing the essential features of the relation between the geography and history of the chief countries of Europe, and especially of the British Islands.

THE *Zeitschrift* of the Berlin Geographical Society publishes an interesting paper, by Dr. Wegener, on the Chinese map of northern Tibet and the Lob-nor District, being a sheet of the official Chinese Atlas compiled by the labours of the Jesuit missionaries at the Court of Pekin, who trained and superintended Chinese surveyors. It was first published in 1718, and an enlarged edition appeared in 1863 extending over the greater part of Asia. This work still is the basis of the European maps of many parts of Tibet, and the careful index of names prepared by Herr Himly, which accompanies the report, is of extreme value, as, not content with the Chinese lettering, he has had recourse to the original Tibetan, Turki, and other native names, which he transliterates with great care.

AUGUST ARTARIA, the eminent Austrian map publisher, who has done much to maintain the character of scientific cartography, died at Vienna on December 14, 1893, aged 87.

MM. SCHRADER AND DE MARGERIE, whose long study of the geology of the Pyrenees is well known, have contributed to the last volume of the *Annuaire* of the French Alpine Club a concise discussion of the geographical conditions of the chain illustrated by a large-scale coloured orographical map. The denudation of the northern slope has been much more complete than that of the southern; the tertiary strata remain on the latter, but on the French side have been eroded away to form the vast fans of alluvium of the lower plain. Despite their general form, the Pyrenees are not composed of ranges running east and west, but of mountain knots and short ranges oblique to the general direction running towards E. 30° S. and then turning towards E.N.E. as a rule. The mean altitude of the chain is about 1000 metres, or say 3300 feet. Elie de Beaumont, on the assumption that the southern slope was strictly similar to the northern, made his estimate of the mean height 500 metres greater. The mass of the Pyrenees, if spread over the surface of France, would raise the level of that country by 102 metres, or 330 feet.

A NEW SULPHIDE OF CARBON.

A NEW liquid sulphide of carbon of the composition C_3S_2 has been isolated in a somewhat remarkable manner in the chemical laboratory of the university of Buda-Pesth, by Prof. von Lengyel, who contributes an account of it to the current *Berichte*. In addition to the well-known disulphide of carbon, several other substances supposed to be compounds of carbon and sulphur have from time to time been described; but as they appear to have been amorphous insoluble solids very difficult to purify, there is very little evidence of their being definite compounds. The substance now described, however, appears to be a very well characterised liquid compound of unmistakable odour and corrosive action upon the skin, and capable of being distilled under diminished pressure.

The method of preparing it was accidentally discovered during the elaboration of a number of lecture experiments illustrating the synthesis and decomposition of carbon disulphide. It was long ago pointed out by Berthelot that this familiar substance decomposes at a temperature but slightly higher than that at which its formation from its constituents occurs. Buff and von Hofmann subsequently showed that the temperature of a glowing platinum wire was ample to bring about slow dissociation of the vapour, and that the disruption of the compound occurred very rapidly indeed at the temperature of red-hot iron wire. An experiment was therefore arranged to ascertain whether rapid removal of the vapour of the synthesised compound from the heated sphere of action would largely prevent the loss by dissociation, and in order that the test should be a severe one, the rapidly moving vapour was subjected in its passage to the high temperature of the electric arc. It was during this experiment that the new sulphide of carbon was unexpectedly produced.

A little more than a hundred cubic centimetres of carbon