

ture concerning this material. He states that he has found none at present.

THE physical papers read at the seventy-eighth meeting of the German Association of Naturalists and Physicians are published in No. 20 of the *Verhandlungen* of the German Physical Society, and also in Nos. 21 and 22 of the *Physikalische Zeitschrift*. A striking case of "chemiluminescence" is described by Prof. E. Wedekind; the interaction of chloropicrin with magnesium phenyl bromide in ethereal solution is accompanied by the production of a green flame beneath the ether, without the latter, however, being caused to kindle or explode. In a dark room the luminescence appears very intense. An interesting lecture on the so-called "liquid crystals" was delivered by Prof. Lehmann at a general meeting of the association; its general scope was to illustrate how the development of such "crystals" appears to mimic the phenomena usually supposed to be characteristic of the simplest forms of living matter.

A COPY of a paper entitled "Niederschlag, Abfluss und Verdunstung auf dem Landflächen der Erde," prepared by Dr. Richard Fritzsche to attain his doctorate (Friedrichs Universität Halle-Wittenberg), has been received. The paper is an attempt to re-calculate from recent data the total yearly rainfall over the earth's surface, and to indicate the transference of water between land and sea. The flow of water through the world's rivers is, of course, also considered in detail, and in this connection a very full list of authorities and references is given, adding greatly to the value of the thesis. In most cases the figure used is compared with that given by Murray. The unit adopted is the cubic kilometre per year. The total rainfall over the whole world is given by Fritzsche as 465,300 cubic kilometres per year, which is equivalent to a uniform depth of 91 centimetres; Brückner gave 94 centimetres. The rain falling on land is estimated by Fritzsche as 111,940 cubic kilometres per year, by Brückner at 122,540 cubic kilometres, and by Murray at 122,318 cubic kilometres per year. The amount given by Fritzsche is equivalent to a depth of 75 centimetres. Considering only the land which is drained by rivers into the sea, it is calculated that only 30 per cent. of the water returns to the sea in this way, the remaining 70 per cent. being removed by evaporation. The tables which accompany the paper are very full and interesting.

SINCE the publication of the first edition of his "Sinnesorgane im Pflanzenreich zur Perception mechanischer Reize" (Leipzig: Engelmann) in 1901, Prof. G. Haberlandt has continued his investigations of the sense organs, or organs of perception, of plants, and he includes his new observations in the second edition of his work just published. The original volume was reviewed in NATURE of April 10, 1902 (vol. lxx., p. 529).

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JANUARY, 1907:—

- Jan. 2. 7h. Neptune in opposition to the Sun.
 3-4. Epoch of January Meteors (Boötids, radiant $230^{\circ} + 53^{\circ}$).
 4. 6h. Venus at maximum brilliancy.
 7. 9h. 56m. to 12h. 56m. Transit of Jupiter's Sat. III. (Ganymede).
 9. 17h. 44m. to 18h. 20m. Moon occults γ Libræ (mag. 4.1).
 10. 17h. 12m. Moon in conjunction with Venus. Venus $0^{\circ} 17' N$.
 13. Total eclipse of Sun, invisible at Greenwich.
 14. 13h. 13m. to 16h. 13m. Transit of Jupiter's Sat. III. (Ganymede).

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- Jan. 16. Venus. Illuminated portion of disc = 0.353.
 17. 11h. 28m. Minimum of Algol (β Persei).
 20. 8h. 17m. Minimum of Algol (β Persei).
 21. 9h. 7m. to 10h. 12m. Moon occults ξ^2 Ceti (mag. 4.3).
 24. Neptune $\frac{1}{2}^{\circ} N$. of 36 Geminorum (mag. 5.2).
 26. 2h. 4m. Jupiter in conjunction with Moon. Jupiter $2^{\circ} 37' N$.
 ,, 6h. 40m. to 7h. 45m. Moon occults ν Geminorum (mag. 4.1).
 28-29. Partial eclipse of Moon, invisible at Greenwich

COMETS 1906h (METCALF) AND 1906d (FINLAY).—From observations made at Mount Hamilton and Rome, Herr M. Ebell has calculated a set of elliptic elements for comet 1906h, after finding that the observed places could not be satisfied by a parabola. The time of perihelion passage, according to these elements, was October 10.794 (Berlin), and the period of the comet is 7.588 years. The elements exhibit a similarity to those of comets Faye, Wolf, 1892 V., 1896 V., and 1900 III., but it is improbable that comet 1906h is identical with any of these, although it probably belongs to the same family. An ephemeris extending to January 28 is also given by Herr Ebell, but, as the comet is so extremely faint, it is not worth while to reproduce it here.

On December 8 Prof. Hartwig, at the Bamberg Observatory, examined the neighbourhood of the comet, and of the star B.D.— $3^{\circ} 696$, with a 10-inch refractor, for the nebulous objects seen at Bordeaux on November 22, but was unable to find them (*Astronomische Nachrichten*, No. 4141).

An ephemeris extending to March 22 is given for comet 1906d in No. 4140 of the *Astronomische Nachrichten* by M. L. Schulhof. This object is now very faint, and is about $1\frac{1}{2}^{\circ}$ south of Pollux.

TWO STARS WITH A COMMON PROPER MOTION.—In vol. ix. of the Monthly Notices of the Royal Astronomical Society, Mr. Bellamy announced that the two stars AG Berlin B 5072-5073 have a common proper motion, and this was confirmed later by Prof. Kreutz. Additional confirmation now comes from Prof. Millosevich, who has compared the available observations since the year 1881 with more recent ones, the last of which was made at Rome at the epoch 1906.39, and finds the proper motion on a great circle to be $1''.385$ in the direction $142^{\circ} 7'$ (*Astronomische Nachrichten*, No. 4132).

OBSERVATIONS OF VENUS.—Continuing his articles on "Planets and Planetary Observation" in the *Observatory*, Mr. Denning discusses the observation of Venus in No. 377, and points out that the difficulties attending such observations have hitherto prevented any final determination of the planet's rotation period, or of the nature of her surface markings.

He also states that the best times to observe the planet are during the evening apparitions in the early part of the year and the morning apparitions which occur in the latter half of each year, when Venus is above the horizon for a long time after sunset or before sunrise. The chief observations of reputed surface markings which have been made since the time of Galileo are discussed at some length in Mr. Denning's notes.

A BRILLIANT METEOR.—Mr. H. E. Wood, of the Government Observatory, Johannesburg, records, in No. 4141 of the *Astronomische Nachrichten*, the observation of a brilliant meteor on July 16 in various parts of South Africa. An observer at Mbabane, in Swaziland, describes the object as a large white ball with a long trail of sparks, and states that it split into two masses each larger than the full moon, whilst a loud explosion accompanied its disappearance. Attempts to locate the object, which apparently struck the earth near to Mbabane, have been unsuccessful. Mr. Wood himself saw a meteor, which he believes to have been the same object, at Johannesburg, two hundred miles away, at 8h. 45m. p.m. (standard time of $30^{\circ} E.$), but he heard no detonation, although the object was very brilliant and left a trail of sparks. As a similar body was observed in Germany on the same evening, Mr. Wood suggests that possibly the earth encountered a stream of meteoric bodies on July 16, and that both the observed meteors were members of the same stream.