and Florida; in summer throughout northern United States and the Great Basin; and in fall over the California coast, central Rockies, southern and eastern United States. The duration of sunshine is about the reverse of the cloudiness indicated, for the cloudiness records are practically only from observations in the daytime.

Previous cloudiness charts for the United States were published (1) in 1890 by General A. W. Greely, of the Signal Service; (2) in 1898 by the Weather Bureau;[5] (3) in 1911 by K. McR. Clark.[6]

AUSTRALIAN METEOROLOGY

THE Australian Weather Service has recently published new monthly and annual temperature and rainfall charts of Australia and Tasmania based on observation series from twenty to forty years in length. These charts correspond closely with earlier ones except that the annual isotherms sweep north in the center of Australia instead of south and the isohyts show the rainfall in greater detail. An annual rainfall of less than 5 inches is indicated in South Australia and as high as 140 inches on the Queensland coast. Commonwealth Meteorologist H. A. Hunt has invented a novel rotary diagram called a "rainfall clock," which indicates in a striking manner the progressive monthly changes of Australian rainfall.

The remarkable constancy and regularity of Australian weather has led Mr. Hunt to suggest the foundation of international meteorological observatories there for purposes of research in the fundamental problems of dynamic meteorology.[7]

NOTES

HOFRAT PROFESSOR DR. JULIUS VON HANN writes that a third edition of his great "Lehrbuch der Meteorologie" will soon begin to appear. It is coming out in sections to make its purchase easier. He expects the work to be complete in the fall of 1914. The first edition appeared in 1901 and the second in 1906. From 1908–1911 Dr. von Hann published the third edition of his great "Handbuch der Klimatologie" in three volumes. These two magnificent works are second to none in the realm of meteorology and climatology.

THE Royal Academy of Holland has conferred the Buys-Ballot Medal on Dr. H. Hergesell in recognition of his service in the investigations of the upper air in the subtropics and arctic, and as head of the International Commission for Scientific Aeronautics. In 1903 this medal was conferred on Professors Assmann and Berson, and in 1893 on Dr. von Hann.

DIRECTOR M. A. RYKATCHEW, of the Nicholas Central Physical Observatory, at St. Petersburg, retired on May 7, after having served 46 years, of which the last 17 were as director.

IN the report of the Chief of the Weather Bureau for 1911–12, recently issued, mention is made of preparations for proposed anemometer tests by Professor C. F. Marvin, now Chief. A whirling machine with an arm thirty feet long and capable of producing wind velocities up to 70 or 80 miles per hour will be used. There will be tests carried on also in a "wind tunnel" through which with blowers a current of air exceeding 100 miles per hour can be forced. These tests are for the purpose of correcting the standard Weather Bureau anemometers to record true wind velocities instead of some 18 per cent. too high as in the past and at present.

CHARLES F. BROOKS
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[5] Report of the Chief of the Weather Bureau, 1896–97.

[6] *Quarterly Journal of the Royal Meteorological Society*, April, 1911, pp. 169–175.

[7] See *Nature*, London, Vol. 91, pp. 355, 435–436, 489.

SPECIAL ARTICLES

THE REDISCOVERY OF PERIDERMIUM PYRIFORME PECK

THE name *Peridermium pyriforme* was proposed by Peck in 1875 for a blister rust growing "on pine limbs in the spring, Newfield, New Jersey." In his original description Peck laid emphasis on the form of the spores which he described as "obovate, pyriform, or oblong-

pyriform, acuminate below, .0015–.0025 inch long." So far as published reports show, no specimen of *Peridermium* has been recorded since that time having spores of this sort. Among mycologists it generally has been assumed that there must have been some error about Peck's description, and the name has been made to apply to a species having the ordinary small ellipsoid spores. The species to which the name has been thus applied is the one which has been culturally connected with *Cronartium Comptoniæ*.

After giving some attention to the matter several years ago the writers came to the conclusion that in Peck's original examination he possibly mistook some of the smaller peridial cells for spores.[1] In studying fresh specimens recently communicated to us from British Columbia, by W. P. Fraser, and from Colorado, by E. Bethel, we have found large pyriform cells which agree exactly in shape and size with the spores of the original description of *Peridermium pyriforme*. It is very evident that in these specimens they can not be peridial cells, for the peridial tissue is present and is composed of very different cells. There seems to be little doubt that we are dealing here with a striking species, very aptly named *Peridermium pyriforme* so many years ago, but which has been unrecognized ever since, while the name has been misapplied. Examination of our herbarium shows that there are a number of other specimens belonging here which had been erroneously, and carelessly, placed under other species. In addition to the three above-mentioned localities we have specimens from Wisconsin, South Dakota, Washington and Alberta. The range for the species is thus seen to be northern United States and southern Canada from ocean to ocean.

Having established the existence of a characteristic heterœcious form of wide geographical range, the question of the alternate phase becomes of immediate interest. Judging from analogy and distribution, together with some field observations, we suggest with much confidence that *Peridermium pyriforme* may be connected with *Cronartium comandræ*.

J. C. Arthur
Frank D. Kern

Purdue University,
Lafayette, Ind.,
July 15, 1913

[1] See *Bull. Torrey Bot. Club*, 33: 420, 1906.

A WINE-RED SUNFLOWER

In *Popular Science Monthly*, April, 1912, I described the finding and subsequent development of the red sunflower. The darker form predicted for 1912 duly appeared, but most of the intensely red types were bicolored, with the ends of the rays yellow. This is ascribed to the fact that the wild plant (var. *lenticularis*) carries a factor for marking, which is not clearly apparent until joined by the factor for red. In the orange or yellow rayed plants nothing more is apparent to the eye than a deepening of the color on the basal part, not distinctly defined or very readily noticeable. In photographs, however, the marking comes out, as is well shown in Dreer's "Garden Book," 1912, p. 221, for the perennial species. One would imagine from Dreer's figures of "Wolley Dod" and "multiflorus maximus" that the rays were bicolored. A much more striking illustration is given by Mr. G. N. Collins,[1] where *Bidens heterophylla* appears to have strongly bicolored rays when photographed in the ordinary way, but when photographed on an orthochromatic plate with a color screen does not appear bicolored at all. To the eye "the difference in color between the base and tip of the rays is barely perceptible."

We obtained from Sutton, of Reading, England, a variety of *Helianthus annuus* with very dark disc and pale primrose yellow rays. It is a tall, upright form, with the ends of the involucral bracts longer than usual. The seeds are black, or nearly. This plant, which comes quite true from seed, is called by Sutton, "Primrose Perfection"; we will call it var. *primulinus*.

In our red sunflowers so far obtained, the red, however bright, was always chestnut, as the result of the orange background. We saw

[1] *Plant World*, November, 1900, plate VII.