

Apogamy in *Pteris serrulata* (L. fil.) var. *cristata*.

CASES of apogamy are so rare and so intrinsically interesting, that it may be worth the while to record at once the following fact:—

About a fortnight ago, while preparing prothallia for imbedding in paraffin, my attention was called by a student to a specimen obtained from a pot containing a fine plant of *Pteris serrulata cristata*.

The prothallium was of somewhat unusual form, perfectly destitute of archegonia and antheridia, but yet had midway between base and apex a peculiar protuberance. This I suspected to be a young sporophyte apogamously developed.

The prothallium was imbedded in the usual way, and yesterday it was cut into a series of sections. These demonstrate conclusively, I think, that the prothallium was apogamous, for while there is no trace of an archegonium, I find, in the first place, a row of scalariform tracheides, and in the second place—except over a limited area, where I believe the apex of the root has been separated off by the appearance of a conical split—there is no sharp distinction between the cells of the sporophyte and gametophyte.

It should be added that my examination of the sections was necessarily a hurried one, and that at present it is impossible to be certain that the prothallium was developed from a spore of *P. serrulata cristata*. The ferns of the garden and house where the prothallium grew, however, included no known apogamous forms.

It is not unlikely that I may be unable to follow the matter further, and this must be my excuse for making public, without further investigation, this interesting fact. A. H. TROW.

University College of South Wales and
Monmouthshire, February 27.

Fireballs.

THE large meteor of February 21 last, mentioned in NATURE of March 1 (p. 419), was also observed by me at Bristol. The time was noted at 7h. 18m., and the meteor was estimated as bright as Jupiter, but its light was much dimmed by the fog, low on the northern horizon, where it appeared. Its direction of flight was not well determined, the path being short and rapidly traversed in a place barren of visible stars, but it was roughly recorded as from $252^{\circ} + 53^{\circ}$ to $253\frac{1}{2}^{\circ} + 49^{\circ}$. Comparing it with the description by Mr. Greig at Dundee, and with notes from North Lincolnshire and other places, it seems the meteor disappeared at a height of about thirty miles over Bolton, Lancashire; but the place and height of its first appearance are not satisfactorily indicated. The probable radiant is in Ursa Major. A good observation from Ireland, or the north-west part of England, would be very useful in assigning the precise path.

A fine example of a fireball, visible in sunshine, was afforded by the meteor of February 8, oh. 28m. p.m., which appears to have been very widely observed in this country. Its real path was from a point above the Irish Sea, west of Southport, where its approximate elevation was seventy-five or eighty miles, and from thence it passed rapidly over Lancashire into Yorkshire, finally disappearing near Leeds at a height of twenty miles, or possibly less. Its radiant point was in Hercules, and the direction of its motion from west by south to east by north. This daylight fireball may have had its origin in the same system as that which supplied the brilliant fireball seen in the evening twilight of February 7, 1863, the radiant of which was about $270^{\circ} + 35^{\circ}$.

Bristol, March 4.

W. F. DENNING.

Astronomy in Poetry.

A *propos* of the subject of "Astronomy in Poetry," permit me to quote one verse from "The Faërie Queene" of Spenser:—

Yet all these were, when no man did them know,
Yet have from wisest ages hidden be:
And later times things more unknown shall show.
Why then should wilsesse man so much misweene,
That nothing is but that which he hath seene?
What if within the Moones fayre shining spheare,
What if in every other starre unseene
Of other worlds he happily should heare,
He wonder would much more: yet such to some appeare.

I have followed the spelling and the punctuation of the text of the "Globe" edition (1879).

Kendal, Westmorland.

G. W. MURDOCH.

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RECENT PUBLICATIONS OF THE AMERICAN GEOLOGICAL SURVEY.

TO initiate and to be left behind—that seems to be the fate of England in the latter half of the nineteenth century. In science, at any rate, it is too often so. A sight of the volumes—fourteen in number, the earliest dated in 1891—with which our table is loaded, a glance at those which are already ranged upon our shelves, indicate that this is emphatically true of the work of the Geological Survey. We mean no reproach to British men of science or to the British surveyors. The State despises the one and starves the other; and the "people love to have it so"; for what care they for learning or research, unless it will obviously put money into the pocket? But this is a large question, and our space will not suffice even for an adequate notice of the volumes before us. These consist of one bound octavo volume on the mineral resources of the United States (the eighth of a series), nine paper-covered numbers of the *Bulletin*, slightly larger in size, ranging from thirty to five hundred and fifty pages; two volumes, still larger, of the Annual Report (eleventh), and yet two volumes of Monographs of quarto size.

Passing by the first as of commercial rather than of scientific interest, we come to the *Bulletin*. Four of the numbers, smaller than the others, though they make up to full 220 pages, have little in common. No. 90 is a report of work done in the Division of Chemistry and Physics, mainly during the years 1890–91. It contains several studies and analyses of special minerals, including a research on certain micas, vermiculites and chlorites, and a note on the colloidal sulphides of gold, in which it is suggested that the separation of free gold in the upper strata of the earth's crust may have been effected by the action of sulphuretted hydrogen on chloride of gold, at no very great depth, though at one less than that at which pyrites is formed. The report concludes with a number of analyses of miscellaneous rock specimens. No. 91 is a "Record of North American Geology for 1890," a very useful bibliography of papers, &c., classified not only under names of authors, but also under subjects. No. 93 is a pamphlet by Mr. S. H. Scudder, on "Some insects of special interest, chiefly from Colorado," and No. 94, which is about the same length, is by Mr. E. S. Holden, on "Earthquakes in California in 1890 and 1891."

The larger volumes of the *Bulletin* are all "Correlation Papers," or memoirs written on some one geological period, by a specially qualified author, "for the purpose of summarising existing knowledge with reference to the geologic formations of North America, and especially of the United States; of discussing the correlation of formations found in different parts of the country with one another and with formations in other countries; and of discussing the principles of geological correlation in the light of American phenomena." Of these four memoirs the largest (No. 86), written by Prof. C. R. van Hise, deals with the "Archæan and Algonkian" systems.

By these names the author designates the vast mass of rocks which lies beneath the *Olenellus* zone of the Cambrian system. In dealing with the subject he has adopted the following method:—Each chapter treats of some important district. It gives full abstracts of the more important papers bearing on the geology of that district, which is followed by a bibliographical list, and concluded by a summary of the results. More than four hundred pages are thus occupied, and the work is ended by a long chapter (about eighty pages) on "general successions and discussion of principles."

The author employs the term Algonkian for "the pre-Olenellus clastics and their equivalent crystallines," and Archæan for the completely crystalline rocks below