

Hopefield Observatory
Haddenham
Thame

31 January 1866

Dear Professor Secchi,

Your last very interesting & welcome letter reached me on the 24 Oct. 1865; I found me unfortunately rapidly failing in health, & sickening, as it proved, for a dangerous & very nearly fatal illness, which confined me to my bed for some weeks; & now, at the end of three months, I am still unable to leave my chamber; but, while sitting propped up by pillows in an easy chair, I am able to spend a little time on most days in writing. But I regain strength at so wonderfully slow a pace that I must not expect to be able to resume any of my usual occupations for many weeks or perhaps months to come: & indeed my Medical Attendants tell me that, having so narrowly escaped a fatal termination of a most painful disease, which in three or four weeks produced the emaciation & debility of advanced Phthisis, & at my age too (67), I cannot reasonably expect a more speedy restoration to anything like even my usual very imperfect health. - Indeed, I greatly fear I shall never again be able to engage in my favourite Observatory work.

But having thus explained the cause of my long silence, I proceed to offer a few remarks on the contents of your letter, - assured that you will readily make every allowance for my present feebleness whether of thought or expression.

It appears ~~that~~ to me that almost the only point on which we do not agree, in respect of the ~~diff~~ nomenclature of the different appearances on the solar photosphere & spots, consists in the propriety of the term "leaves" as applied to the forms of some ^{bright} elongated bodies projected on to the penumbra, & to a small extent on to the umbra also, - especially of large spots of somewhat symmetrical figure.

I must acknowledge that I have strong objections to the name "Leaves":
1st Because most persons who have heard of Nasmyth's "10 to 1" "Willow Leaves" are still apt to associate the name with such forms as he has so described, & most carefully & accurately depicted: - for he possesses the immense advantage of being an exquisite draughtsman. Thus therefore, many might continue to be misled by it, unless some

modification were attached to ~~the~~ the term, specifying in each particular instance what kind of leaf was referred to; & thus removing in fact the very impression which it is calculated to make. But surely the necessity for this would be very undesirable. — 2nd Because the term "leaf" is exceedingly indefinite; "leaves" being of almost all forms, from nearly linear to broader than they are long. — It also happens that in almost every spot of considerable size, there are many different forms of these bright elongated bodies: these are not impregnably mingled together. To say therefore that "the penumbra of such a spot was covered with leaves" would convey no definite idea ^{of the forms of} of those bodies.

You will doubtless remember that I first used the word "straws" as a term of comparison for the ends only of the bright lines on the penumbra, as they are seen projected beyond its inner edge to somewhat irregular lengths onto the umbra, — describing them as resembling "the edge of a piece of coarse thatching with straw left untrimmed." — The term "straws" may not be so applicable to the whole length of some of the bright ridges or faculae; — certainly not if straws were always straight, which however with us they are not. — The more sharply they are defined under large apertures, a fine state of the air permitting the use of high powers, the more rarely are they seen really or regularly divided into small portions of nearly the same dimensions or proportions. — Such at least is the result of my own very careful observations, with which some of the best that have been made in this country agree very well. — Have you seen the Paper on the Solar Photosphere by Mr. Fletcher, which is printed in the Mon. Not. of the R. A. S. for Nov. last? He has been a most careful observer for nearly 20 years; & he now possesses one of the most perfect refractors in this ~~country~~ country, whose clear aperture is 9½ inches (English). Its mounting is of extraordinary solidity, & convenience also. — We ~~are~~ have not lately corresponded on the subject, & therefore his results are perfectly unbiased by any prejudice or influence from me personally.

Pray accept my cordial thanks for your very acceptable present of your "Catalogue of Measures of Double Stars", (1860); & the Bellefleur Photometeorologico, bearing date 31 Oct 1865. — I only wish I were as well acquainted with your beautiful & elegant language, as you are with our rough & composite tongue. You have really taken immense pains to render my letter intelligible to your scientific countrymen generally, few of whom I suppose are well acquainted with English; & I really feel that in so doing you have paid me a high compliment. Its subject is one of public

scientific interest, & therefore I could not have the least objection to its publication; & I trust you will feel the same respecting your extremely interesting & valuable letters addressed to myself.

Feb 10. - Alas! My dear Professor! though I had been better the whole of the day on which I wrote the former portion of this letter, than I had been since the first attack of my complaint; yet in the night I was seized with a rather severe relapse, which soon brought me down very low again, & sadly disappointed the hopes which had begun to be entertained of my advancing rather more ~~more~~ rapidly. Unfortunately, no cause for this relapse can be found, unless it be, that on that day I had walked further (though only to & fro in my bed-chamber) than I had previously ventured to attempt. So weak a vessel I have become! - Being well acquainted with my enemy, & having most efficient help at hand in my kind & clever Nurse, - a real Sister of Mercy, - a very vigorous ^{upon the complaint} attack, soon mitigated the violence of the ~~relapse~~ ^{relapse}; & I am thankful to say that I am now greatly relieved. Still, I have been thrown back very considerably. I am however so anxious to resume my letter that I hope you will excuse the too obvious evidences of feebleness.

Not indeed that I have much more to say on the subject at present; - only one or two remarks on your ~~very~~ interesting & important questions, - "Are these granules really taking the elongated shape of leaves? How do they so? In what circumstances? On the influence of what forces do they so, & undergo such a transformation?"

As a preliminary question, may it not be asked, "How are the bright ridges or faculae formed on the photosphere itself?" Are they composed of conglomerated granules? They usually abound of very various dimensions, from very small to very large, in the vicinity of spots which are breaking out: in large spots they may not unfrequently be traced extending from a very bright portion of the photosphere at the edge of the spot, entirely across the penumbra, & forming a luminous bridge across the umbra, or even reaching the photosphere again on the other side. - Now, the bright lines or ridges (as I believe them to be) on the penumbra do not appear to me to differ at all in essence from the faculae on the photosphere. These vary much in appearance & proportion under different circumstances, especially when under the influence of spot-forming, or spot-closing forces: yet it seems to me better to retain the well-established name of faculae (though far from appropriate); or to employ the

the general appellation of ridges (which I should prefer if we could get it adopted) than to call them "Leaves", which, while it seems to express something definite in form, does in fact avoid no difficulty on the ground of indefiniteness; & may mislead by being understood in a more definite sense than was intended by the writer employing it.

Feb 7/15. I have not recovered from my late relapse so well or so speedily as I hoped. The latter part of this letter has been written during very brief intervals of comparative freedom from pain; & I must trust to your kindness to excuse all blunders of every kind.

Remain,

With great esteem

Yrs most truly

WR Dawes

P.S. During my illness I have received two very interesting Meteorological Bulletins from Palermo, dated May (N^o 5) & Nov (N^o 11) 1865. Unfortunately I am quite unable to send any suitable notice of them at present.

WRD

M. R. Dawes