



## XL. A simple mode of exhibiting Netwon's rings, and a mode of exhibiting the fixed lines in the spectrum

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N.B. Should it be in your power to procure me any observations made of this eclipse in England or America, you would greatly oblige thereby

Your obedient Servant,

Hamburg, Oct. 5, 1836.

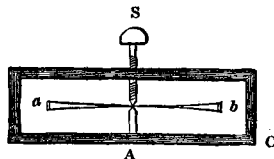
C. RÜMKEK.

*XL. A simple Mode of exhibiting Newton's Rings, and a Mode of exhibiting the Fixed Lines in the Spectrum. By the Rev. W. RITCHIE, LL.D., F.R.S., Professor of Natural Philosophy in University College, and in the Royal Institution of Great Britain.\**

1. **T**O exhibit Newton's rings a lens of a long focal distance is generally considered necessary, which is both expensive and difficult to obtain. In a lecture which I delivered nearly two years ago in the Royal Institution, I showed a very simple mode of performing the experiment, which, I have no doubt, will be acceptable to many of your readers. Take two circular pieces of thin plate glass (Dutch plate) about six or eight inches diameter.

Gild a ring of one of the plates about a quarter of an inch broad from the circumference of the circle with gold-leaf, place the plates over each other, and by means of a rectangular frame of iron or brass and a screw, bring the plates to touch in the centre. Let  $a\ b$  represent the glass plates,  $B\ C$  the rectangular frame,  $S$  a screw, and  $A$  a projecting point.

By means of the screw the plates will be brought to touch in the middle, whilst they are separated at the circumference by a single gold-leaf. When this is held so that light from the sky or a lamp falls obliquely on the plates so as to be reflected by the under plate to the eye, the rings will present themselves in circles round the dark spot in the centre.



2. Procure a prism of good flint glass, having one of its angles containing 70 or 80 degrees. Place two thin slips of metal with smooth edges in an opening in a window-shutter, through which the white light of the clouds is admitted. View this *film* of light through the *large* angle of the prism kept close to the eye, and the principal fixed lines as well as many of the others will be distinctly visible. If a bottle containing nitrous gas be placed opposite the opening, the lines will become more strongly marked and more numerous. With one

\* Communicated by the Author.

of my finest prisms this spectrum appears like a piece of *striped* cloth.

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XLI. *On a Method of producing Achromatic Light in Solar and Oxy-hydrogen Microscopes, and on the Effect of a Current of Air upon the Rays that occasion Heat.* By the Rev. J. B. READE, M.A.\*

IT will no doubt be admitted, that the experiments of Melloni on radiant heat and light have not only given us much insight into the nature of these two agents, but have also tended to solve the important problem which had been raised as to their identity. Henceforward, therefore, any new facts can occupy but a secondary place, and, however interesting in themselves, their real value must depend on their conforming to a theory which has already been independently proved.

The received theory is, that the luminous and calorific rays are two essentially distinct modifications which the æthereal fluid suffers in its mode of existence, and that they may be easily separated the one from the other by transmitting the æthereal fluid through screens of different substances.

Melloni, in his experiments, has employed a variety of radiating sources, and received the rays on screens of coloured and uncoloured glass, liquids, and crystallized bodies. The tables with which he has furnished us of both solid and liquid bodies, exhibit the common thickness of the screens employed, and besides the substance, the indications of the thermomultiplier, and the number of rays transmitted as compared with the whole radiation. The effect produced appears to vary with nearly every variation of the substance, and it is only with sulphate of copper, and a peculiar species of green glass coloured by means of oxide of copper, that no calorific action is perceptible.

In following out Melloni's idea of the separation of the calorific and colorific rays†, I have sought in my own experiments to attain this object by modes sufficiently effective in themselves, and, at the same time, admitting of such easy application to the solar and oxy-hydrogen microscopes, that achromatic object-glasses, and objects mounted in balsam, may be used without risk or danger.

That method which I have found to be very successful, and attended with the least possible amount of trouble, consists, as I have stated in a paper communicated to the Royal Society, in a certain position of the condensing lens and the field-glass of the solar microscope, by which a difference of at least 50°

\* Communicated by the Author.

[† A translation of Melloni's paper on this subject will be found in Scientific Memoirs, Part III. p. 388.—EDIT.]