still nearer, the bands re-appear and become narrower, but he thinks are not seen so distinctly as when the eye is too far off (this may, however, depend on the practical difficulty of that part of the experiment). 7, Bands which are visible when the mica is on the violet side, and invisible when it is on the red side, never occur when the spectrum is pure. 8, Bands are frequently visible when the spectrum is pure, but in that case they can be seen equally well whether the mica be placed on the violet or on the red half of the pupil. Mr. Airy then gave a rapid sketch of the leading features of the undulatory theory,—showed how a series of rays or a wave in passing through a convex lens being more retarded in passing through the middle of the lens than through the edges, was bent so as to be convex to the lens after passing through it, and thus was made to converge to a focus. Next, if a thin plate of a transparent substance like mica were made to cover half the lens, one-half the waves were retarded; and thus, when the lens represented the eye, and the place of the focus the retina, interference was produced, which, when the distance of the retardation bore a certain relation to the distance of two waves (or the wave length), might obliterate the light altogether. Next, if a luminous point be looked at, it never is seen as a point, but as a small circle of light; and if a retarding plate be interposed, under some circumstances bands or fringes parallel to the edge of the retarding plate are generated in the circular image of the luminous point; and those bands are not symmetrically arranged from the centre of the circular image. Now, if different luminous points be superimposed (as, suppose, points of the different coloured lights contained in white or solar light), in general it would be easily understood that the bands belonging to one colour would fall asymmetrically between the bands in the circular image of another colour; and thus, if a multitude of them were superimposed, they would tend to obliterate each other. It resulted from a mass of calculation to which he had subjected these conditions, that the relation of the wave lengths of the different colours, in passing from the violet to the red end, was such, that, under favourable circumstances, a retarding plate being made to cover the half of the eye next the violet end, the bands came together, and so strengthened each other and became obvious to sense, but on turning the plate to the red end, the bands separated and obliterated each other. Thus the phenomenon became a simple consequence of the undulatory theory.

Sir David Brewster said, that though Mr. Airy had kindly put into his hands, some days ago, his memoir on this subject, he had not been able to look into it, and was therefore the less qualified to express any opinion on the explanation which it contained. It appeared, however, from the abstract given by Mr. Airy, that his theoretical explanation was founded on the fact, that the dark bands are only seen when the prismatic spectrum is out of focus. Now (said Sir D. Brewster) this fact was never observed by me; and I can state explicitly that the bands are well seen when the definite lines of Frauenhofer are sharp and distinct; and indeed this must have been the case in my observations, for, whether the spectrum was seen with a telescope, or simply with the unassisted eye, I frequently counted the number of bands which lay between the first lines of the solar spectrum. With regard to the cause of the phenomenon in question, I cannot avoid mentioning the singularity of the circumstance, that the undulatory theory, in the superabundance of its power, shall have furnished us with two different and incompatible explanations of the same phenomenon. Prof. Powell, of Oxford, has given one theory as the undoubted one, and Mr. Airy another. I have put myself to a great deal of trouble in satisfying my own mind that Prof. Powell's explanation has no physical foundation; but I cannot hope to arrive at the same result respecting the more elegant and profound theory of the Astronomer Royal. But the mere existence of the bands and their disappearance is but a small part of the results which I have obtained. The appearance of the bands, when seen most distinctly, is very curious—resembling sometimes a screw or a granular line, or a dark line, including within it specks of light. Still more remarkable phenomena are displayed when the spectrum is simultaneously viewed through different thicknesses of the retarding film. Beautiful systems of bands are thus exhibited, all the phenomena of absorbent media are produced, and bands of white light, incapable of decomposition by the prism, are insulated. With films of doubly refracting media a different system of bands is exhibited in the ordinary and extraordinary spectrum, and phenomena exhibited which will call forth all the resources of the undulatory theory. An account of these experiments I am now preparing for the Royal Society; but I have been prevented from completing them by a troublesome affection of the eye.

Sir David Brewster gave a short account of four optical communications:—Dr. Reade's Theory of the Iriscope,—Mr. A. Bell's account of what he considered a new case of Interference,—an account of a singular Rainbow seen by Mr. Bowman, in which parts of a bow, between the primary and secondary bows, were formed by reflection from the sea,—and of another Rainbow seen by the Rev. Mr. Fisher in Dumfriesshire, in which the primary bow was accompanied with *five* supplementary bows, and the secondary one with *three*.

Sir D. Brewster stated that Mr. Fisher had observed more supplementary bows than had been previously noticed; and that a rainbow similar to that observed by Mr. Bowman had been seen by Dr. Halley, at Chester, in 1698. He also mentioned the existence of *deep purple light*, occupying the whole space between the two rainbows, which he had described to the British Association at Edinburgh in September, 1834, he had also observed on the 5th of November, 1834, and on the 24th of September, 1836. In these cases, the light within the primary bow, and without the secondary one, was white.

Prof. Forbes reported that, agreeably to the instructions of the Association, Mr. Osler's anemometer had been erected at the Astronomical Institution, Edinburgh, and is now at work under the superintendence of Prof. Henderson and Mr. Wallace.

Mr. Airy gave an account of Mr. Fowler's new Calculating Machine. The origin of this machine was to facilitate the guardians of a poor-law district in Devonshire in calculating the proportions in which the several divisions were to be assessed. The chief peculiarity of the machine was, that instead of our common decimal notation of numbers, in it a ternary notation was used; the digits becoming not tenfold but threefold more valuable as they were placed to the left; thus, 1 and 2 expressed one and two as in common, but 1 0 expressed (not ten, but) three, 1 1, four, 1 2, five; but again 2 can be expressed by three, with one taken from it. Now, let $\bar{1}$, written thus, with a small bar above it, mean that it is subtractive; then, 1 2 and 2 $\bar{1}$ are the same in effect, both meaning five; and, for a similar reason, by replacing 2 by its equivalent 1 $\bar{1}$, we have five written in there several ways: 1 2, or 2 $\bar{1}$, or 1 $\bar{1}$ $\bar{1}$; the last is the form used. It is obvious that by an assemblage of unit digits thus positively or negatively written, any number may be expressed. In the machine, levers were contrived to bring forward the digits 1 or $\bar{1}$, as they were required in the process of calculation.

Dr. Anderson then submitted some observations on the Dew Point, in which he explained the principles of the formula which he deduced several years ago, from the experiments of Dalton and Gay-Lussac, for determining the various objects connected with the hygrometric state of the air; and showed, by means of tables which he had constructed from it, the facility and dispatch with which the absolute as well as the relative humidity of the atmosphere, together with the dew point, might be obtained. He concluded his observations on the subject by pointing out the exact coincidence which holds between the dew-point and the minimum nocturnal temperature; and proved that the quantity of moisture in the state of vapour which exists in the air, in every region of the earth, operates as a check upon the diminution of temperature by radiation, during the night; for this obvious reason, that the transition of the aqueous vapour to the liquid state, evolving its latent caloric, warms the circumambient air, and by giving birth at the same time to cloud in the form of vesicular vapour, counteracts the cooling processes to which the nocturnal air is exposed in the absence of the sun. The fact, so important in meteorology, affords an illustration of the reason why the windward sides of continents and large islands are warmer than their leeward sides, in the same parallel of latitude, and why dry and parched tracts of land are always found liable to severe cold during the night. It also furnishes an explanation of the causes which occasion the deflections of the isothermal lines, when taken in connexion with the modifications which these lines receive from geographical position and elevation above the earth's surface.

Col. Sykes communicated the contents of a letter from India, from Capt. Aston, one of the diplomatic agents of the government of Bombay, in Kattywar, on the subject of a recent singular shower of grain. He stated that full sixty or seventy years ago, a fall of fish, during a storm in the Madras Presidency, had occurred. The fact is recorded by Major Harriot, in his 'Struggles through Life,' as having taken place while the troops were on the line of march, and some of the fish falling upon the hats of the European troops, they were collected and made into a curry for the general. This fact for probably fifty years was looked upon as a traveller's tale, but, within the last ten years so many other instances have been witnessed and publicly attested, that the singular anomaly is no longer doubted. The matter to which he had to call the attention of the section was not to a fall of fish, but to an equally remarkable circumstance, a shower of grain. This took place on the 24th of March, 1840, at Rajket, in Kattywar, during one of those thunder storms, to which that month is subject; and it was found that the grain had not only fallen upon the town, but upon a considerable extent of country and round the town. Captain Aston collected a quantity of the seed and transmitted it to Colonel Sykes. The natives flocked to Capt. Aston, to ask for his opinion of this phenomenon; for not only did the heavens raining grain upon them excite terror, but the omen was aggravated by the fact that the seed was not one of the cultivated grains of the country, but was entirely unknown to them. The genus and species was not immediately recognizable by some botanists of the Section D., to whom it was shown, but it was thought to be either a *spartium* or a *vicia*. A similar force to that which elevates fish into the air, no doubt operated on this occasion, and this new fact corroborates the phenomena, the effects of which had been previously witnessed.

Mr. Graham Hutchinson read a paper 'On a Method of Prognosticating the Probable Mean Temperature of the several Winter Months from that of corresponding Months in the preceding Summer.'—From the slowness with which the increased temperature of summer penetrates the surface of the ground, Mr. Hutchinson thought it probable that the last portion absorbed during the summer half of the year, and which descends to the least depth below the surface, should be the first portion given off during the winter half; and, in like manner, that the first portion absorbed during the summer half, and which must descend to a greater depth below the surface than any other portion, should be the last to be given off during the winter half. And though the diffusive tendency of caloric, and the variations of temperature arising from alterations in the direction of the wind, &c., may render it impossible to predict within a week when the first, the last, or any other portion of the summer's heat is absorbed or given off by the earth's surface; still, by embracing a period of longer duration, such as a month, we may, on an average of years, come somewhat near the truth. Agreeably to the principle above stated, the months in which an absorption of heat takes place should have corresponding months of retrocession, or some approximation thereto; and consequently, that the mean atmospheric temperature of any month in the summer half of the year, would afford a means of prognosticating the mean temperature of its corresponding month in the winter half, so far at least as that mean atmospheric temperature depended upon the retrocession of heat absorbed during the previous summer half. For facility of comparison, the two equinoctial months, September and March, were left out of consideration. The corresponding months of temperature then are as follows:—

August has	October	following
July	November	for its corresponding month of temperature.
June	December	
May	January	
April	February	

If, for example, August be warmer than average, the