

I examined carefully, some weeks ago, some extensive heaps of sand and gravel raised on the premises of the Water-works Company on the right across the Hammersmith Suspension-bridge, but found no worked flints. The gravel here may be of more recent deposition.

With regard to the Neolithic implements of Acton, I am interested to hear that Mr. Worthington Smith is familiar with them, and that there are specimens in the Pitt-Rivers Collection. My letter nevertheless will have done good in making their occurrence more generally known.

As regards the quartzite pebble, if more are found on the fields about Acton it will tend to show that they have served the same purpose as those in South-East Devon, and that they have been brought from a region where specimens adapted for missiles would be found in abundance, viz. the south-west coast, as gravel sections and gravel pits were not accessible in Neolithic times, nor would they have proved adequate arsenals. But if the pebble I found at Acton were accidentally derived from the Middlesex gravel (which contains a considerable quantity of Midland Bunter material), it is remarkable that a selection should have been made so well calculated to deceive a Devonshire neolithologist.

July 19

SPENCER GEO. PERCEVAL

### Lightning

ABOUT 10 a.m. of the 6th instant two of the labourers on this farm were sitting on the ground (with their backs against a clover haystack and their faces towards the north, having in front of them and on their left a wood) engaged in eating their lunch. It had been raining and thundering for about half an hour, but not heavily, until suddenly—in the words of one of the men—"a flash of lightning came right at us as if it were shot out of a gun." This man had his knife up to his mouth at the time in the act of eating, and he describes his sensation as a feeling of nausea in his throat and chest, and also that both he and his companion felt an actual push against their shoulders, which swayed and shook them to a considerable extent from the direction of the flash. The other man was blinded for about five minutes, and they were both much dazed for some time. Also they both describe having heard a sharp whiz somewhat resembling the quick escape of steam from an escape valve on an engine. For two days after they both suffered from severe headache.

A. HALL, JUN.

Filstone Hall, Shoreham, Kent, July 11

### THE COMET

IN a paper read to the Paris Academy on the 11th inst., giving further observations on comet  $\delta$  1881, M. Wolf says:—

"The analysis of the light of the comet furnishes data as to the constitution of that body, which it is important to consider before starting any hypothesis as to its nature and mode of evolution.

"I have examined the spectrum of the comet, both with a highly dispersive spectroscope mounted on the Foucault telescope of 0.40 m. aperture, and with a smaller instrument, mounted on the telescope of 1.20 m., giving therefore a very large quantity of light. This spectrum is triple: one sees (1) a continuous spectrum, broad, but very pale, visible in all the regions of the comet; (2) a continuous spectrum nearly linear, and very bright, given by the nucleus; (3) the spectrum of three bands, yellow, green, and blue, characteristic of the light of all comets examined hitherto. I have never been able to see the violet band.

"The continuous spectrum of the nucleus indicates the existence of solid or liquid matter, luminous of itself or by reflection. I have suspected in the strip some dark interruptions, especially in the region near D, without being able to determine their position. The presence of these dark lines, demonstrated by Dr. Huggins' photographs, denotes a reflected light, which can be no other than that of the sun.

"The nebulosity which forms the head of the comet gives, besides the continuous pale spectrum, the bright

bands of an incandescent compound gas. The researches of M. Hasselberg tend to assimilate these bands to those of a carburet of hydrogen, probably acetylene. Besides these bands one sees throughout the strip formed by the light of the nucleus other protuberances very short, and paler, which seem to indicate, in the hotter and more luminous parts of the comet, an incandescent atmosphere of more complex constitution.

"When the slit of the spectroscope is passed over the comet, starting from the head, one finds the three bands all round the nucleus, at nearly the same distance from all the sides. They disappear in the tail properly so-called, the very pale spectrum of which seems to be continuous. Thus only the nebulosity surrounding the nucleus contains incandescent gases. The light of the tail comes to us from a pulverulent matter, luminous, or simply illuminated. Such are the data of spectroscopy.

"The polariscopic examination of the comet's light completes these first results. I used, as polariscope, a quartz plate perpendicular to the axis, giving the sensible tint, and a double-refracting prism, placed between a collimator and an observing telescope, in place of the prism of a direct-vision spectroscope. The two images of the nucleus and the nebulosity surrounding it are projected, well separate, on the common part of the field formed by the background of the sky; this is the process indicated long ago by M. Prazmowski for eliminating atmospheric polarisation. Under these conditions the nucleus and the nebulosity appear both distinctly polarised in the median plane of the tail, consequently in the plane passing through the sun. Here then, at least in all parts of the nebulosity round the nucleus, we have reflected light coming from the sun, and a non-gaseous matter possessed of reflecting power. I have had this important result verified by my assistant, M. Guénaire, and by several students in the Observatory.

"This process, so sensitive, evidently cannot serve for the tail, which occupies the whole field of vision, and does not moreover present very distinct limits. I have vainly tried other polariscopes—Savart's, for example. It would be very difficult besides to separate here the real polarisation of the tail from that of the atmosphere.

"In proportion as the light of the comet is diminished, the spectrum of the nucleus becomes paler; its colours, well pronounced on the earlier days, are no longer seen except on the side of the red; the bright bands retain their brightness. The green band is always distinctly limited in the less refrangible part. It will be interesting to know whether the comet, reduced to telescopic brightness, will at the same time have its light reduced to that of an atmosphere purely gaseous.

"On June 29, at 5h. 49m. sidereal time, during my polariscopic observations, a small star was found in the nebulosity, at a very short distance from the nucleus. Its image had not undergone any change, either of brightness or of form."

At the same *séance* M. Thollon communicated a note of spectroscopic observations of the comet as follows:—

"These observations were made with a direct-vision spectroscope which MM. Henry of the Observatory were good enough to lend me. The dispersion is that of an ordinary prism. A micrometer eye-piece, with point, giving 1-200th of a millimetre, enables one to make measurements of very high precision.

"In the night of June 24 I made my first observations and measurements. The nucleus presented then a very brilliant continuous spectrum, on which no trace of bands could be distinguished. On the violet side it extended beyond the line G. The parts next the nucleus likewise gave a continuous spectrum, on which the bands were still invisible; they only appeared a little further on and faintly. In the continuous spectrum I have thought I perceived several times a very complicated system of dark lines, and occasionally I believed I saw in the spectrum