clusions, using a rather different method. Although Bowden's work is very much more comprehensive and complete than our own, we feel that a brief account of our results obtained under different conditions may be thought of interest as confirming his. The results are also interesting as indicating the nature of residual current.

In our work a pool of carefully purified mercury of about 7 sq. cm. area was used as cathode, the electrolyte being normal sulphuric acid. Air was dispelled from the cell by boiling and cooling under a stream of hydrogen, obtained by electrolysis from a portion of the same solution. A very thorough elimination of oxygen was absolutely essential. A current of the order of 10^{-4} amp. per sq. cm. of cathode surface was then passed to the mercury as cathode for a few minutes to deposit any stray mercury ions that might be in the solution. After standing for a minute or two the electrode was positive to the saturated calomel electrode, that is, its potential was more positive than the hydrogen electrode by more than 0·3 volt. On passing a current of the order of 1 micro-amp. per sq. cm. to the mercury as cathode, the rise of potential could be followed easily with a potentiometer. Overpotentials of 0·3 or 0·4 volt were produced (that is, the electrode potential changed by 0·6 or 0·7 volt) when less than one-eighth of a monomolecular layer had been deposited. From the nature of the time rise curves there were indications of oxygen being incompletely eliminated, and it seems probable from this and other observations that a still smaller deposition would give rise to an overpotential under ideal experimental conditions.

Unless the greatest care was taken to remove oxygen, no overpotential was produced with currents so small as this; instead, the familiar effect of residual current was observed at a potential more positive than that of the hydrogen electrode. This was evidently due to depolarisation by dissolved air.

A. L. McAulay.
D. P. Mellor.

Physics Laboratory,
University of Tasmania.

Correlation.

In Nature, June 2, under the heading "Correlation," Mr. Dufton refers to a graphic method for the determination of a linear function, from 14 points, which must be taken as having the same weight, in the absence of any information as to their respective worth.

It is difficult to follow Mr. Dufton's method. He refers to the 'median of X,' without defining what is meant by this. The figure shows a vertical dotted line, likewise unexplained, except that there are seven plotted points on each side. The line seems then to have been drawn at random, except that the same number of points is found on either side. But any person accustomed to graph work can see at once that the line is wrongly placed: the points on one side are as a whole farther from it than the points on the other side; in other words, the line does not pass at all *evenly* among the points.

Readers of Nature may be interested to know that while there is no need to have recourse to the method of least squares in such a simple case, yet there is a method which enables one to ascertain fairly accurately the position of the graph. It is Cauchy's method, which yields in a few minutes, in this case, the equation $y = 9{\cdot}25 - 0{\cdot}75x$. This line passes through two of the given points ($y = 7, x = 3$, and $y = 1, x = 11$), and it satisfies also Mr. Dufton's criterion, as it has six points on each side, but a glance shows that it is a far better solution, as it is possible to 'pair off' the points so that the points of each pair are very nearly symmetrically distributed with respect to the graph, which is not possible with the graph given by Mr. Dufton. The points below the line are, except one, much nearer than the points situated above the line, as can be verified by drawing the line representing the above equation.

Cauchy's method appears to be practically unknown among physicists and engineers. It applies to functions of a higher degree as well. A description of this method for the determination of the constants of empirical formula will be found in *The Engineer* for Sept. 13, 1912, p. 267, with applications to functions of the first, second, and third degree, completely worked out.

It is easy to go astray when drawing a line to suit points so erratically distributed as those in the example selected by Mr. Dufton, and a method which enables one to obtain the equation without fumbling is invaluable in such cases.

M. E. J. Gheury de Bray.
40 Westmount Road, Eltham Park,
London, S.E., June 24.

The Arc and Spark Spectra of the Halogens.

The issue of Nature for June 30, 1928, contains a very interesting note from Dr. Laporte on the arc spectrum of chlorine. The reader will, however, be surprised to find it stated there that the separation of the chlorine lines into arc and spark lines has not hitherto been accomplished, reference being made to Kayser's "Handbuch," which lists the two types of lines together indiscriminately.

So long ago as 1915, Nelthorpe showed (*Astrophysical Journal*, vol. 41, p. 16) that the two sets of lines are quite well distinguishable by their different behaviour in a condensed discharge. More recently L. and E. Bloch (*Annales de Physique*, vol. 7, p. 206, and vol. 8, p. 397) have given a complete separation of the arc and spark spectra, as well as a division of the latter into spectra of the first and second orders. This division has been effected not only for chlorine, but also for bromine and iodine (*Comptes rendus*, vol. 180, p. 1740; 1925; and vol. 184, p. 193; 1927). We may add that in the meantime a third order spark spectrum of the latter metalloid has been found, well developed in the ultra-violet. The data have been examined, and have already led us to a recognition of some fundamental terms in the spectrum Br II.

Leon Bloch.
Eugène Bloch.

École Normale Supérieure,
Paris.

The Green Flash.

In some localities the green flash at sunset is by no means so rare a phenomenon as might be inferred from Prof. Wood's experience on the Atlantic Ocean and from the letters of some other correspondents of Nature. Here in Southern California in the last two years, I have seen the flash many times as the sun has set over the Pacific Ocean, or over the Santa Monica Mountains a few miles west of our residence. On one occasion Mrs. Barnett and I both saw the flash as the sun sank behind a dense cloud; and at least once I have seen the colour of the flash change distinctly from green to blue or blue-green before disappearance.

S. J. Barnett.
University of California at Los Angelos and
California Institute of Technology,
May 30.