pressed for taste and smell by Haycraft (*Proc.* Roy. Soc. Edin., 1883–1887).

But we now know gaseous bodies ranging over the whole domain of molecular weights appropriated by odorous and sapid substances, owing to Ramsay's well-known work on He, Ne, A, Kr and X, and to the discovery of SO_2F_2 and SF_6 by Moissan (*Comptes rendus*, cxxx. 1900, 865 and cxxxii. 1901, 374). These last two gases are of special importance because their want of taste and odour cannot be due to the fact that we have become inured to them. The molecular weights of these bodies are respectively 4, 20, 40, 81, 127, 102 and 146, with which may be compared vanillin, with a molecular weight of 152.

It was long ago pointed out by Liebig (see Klimont, "Die Synthetischen und Isolirten Aromatica," 1899) and by Graham (see Bain, *loc. cit.*) that odorous bodies are, as a rule, readily oxidised, and the notion of the chemical origin of the senses in question is much strengthened by the fact that all the new gases above mentioned are very inert. SO_2F_2, although soluble in ten parts of water, can only be decomposed by oxygen by sparking, and SF_6 is extraordinarily stable. It is recorded also by Graham that if an odoriferous principle is sniffed up in a current of CO_2 instead of air, the odour is much weakened.

There is another curious fact which might be accounted for by a chemical hypothesis. It has often been noticed that on purifying odorous or sapid substances, these properties tend to become less marked or to disappear. Thus acetylene, ammonia and acetamide have been described as odourless when pure, and it is said that ordinary sugar becomes less sweet the more it is purified. But it has been found in all carefully studied cases that stability increases very markedly with purity, and therefore on a chemical theory taste and smell would become correspondingly less.

In conclusion must be noted Prof. Ayrton's important contribution to this subject (Presid. Address to Section A. British Association, 1898), in which he definitely proves that the well-known metallic odours are not caused by the metals themselves (which are non-volatile), but by unstable decomposition products, probably unsaturated hydrocarbons.

Such a chemical explanation would not, of course, upset the vibration theory of Ramsay, but would merely mean that instead of these senses being directly stimulated by the ordinary vibrations of the molecules, they are only affected by agitations accompanying chemical change.

F. SOUTHERDEN.

Technical College, Finsbury, London, E.C., March 21.

Electricity and Matter.

IN view of the suggestive close of Sir Oliver Lodge's paper as given in NATURE of March 12, these more than century-old speculations of S. T. Coleridge may be found interesting.

E. H.

"But properties are God: the naked mass
(If mass there be, fantastic guess or ghost)
Acts only by its inactivity.
Here we pause humbly. Others boldlier think
That as one body seems the aggregate
Of atoms numberless, each organized;
So by a strange and dim similitude
Infinite myriads of self-conscious minds
Are one all-conscious Spirit, which informs
With absolute ubiquity of thought
(His one eternal self-affirming act!)
All his involved Monads, that yet seem
With various province and apt agency
Each to pursue its own self-centring end.

(From "The Destiny of Nations—A Vision," Juvenile Poems, S. T. Coleridge.)

Papaw-Trees and Mosquitoes.

Re Prof. Percy Groom's letter in NATURE (January 22, p. 271), I may mention that in Ceylon the papaw-tree gives no immunity against mosquitoes. In my garden here we usually take our afternoon tea under the shade of an old and much-branched example of the common papaw (*Carica papaia*), but far from being protected from mosquito bites in that situation, we are always terribly molested by the small striped mosquito (*Stegomyia scutellaris*). The stem of this tree is also haunted by various spiders and flies. I have not sufficiently studied the tree during the sunny part of the day to say whether flies settle on the leaves or not, but I propose to pay attention to this question shortly.

E. ERNEST GREEN.

Royal Botanic Gardens, Peradeniya, Ceylon, February 26.

A Remarkable Meteor.

WITH reference to the meteor a letter of mine concerning which you printed in your last issue (p. 464), I have received some details from Mr. G. S. Russell, of West Norwood, who saw it from the neighbourhood of the Crystal Palace. From the facts that he saw it E.N.E. (as I did) and saw the "wobbling" close to earth, it is seen that the meteor must have been a great distance off, probably falling a considerable distance out in the North Sea. He is convinced that it reached the earth's surface. Its great distance off would account for its apparently very slow movement. Owing to the steadiness of both its brilliancy and velocity it was probably of great size.

J. E. C. LIDDLE.

Fairfields, Basingstoke, Hants, March 23.

THE MOVEMENT OF AIR STUDIED BY CHRONOPHOTOGRAPHY.

THE investigation of stream lines has occupied the minds of several powerful workers, and great results have been obtained by the late W. Froude and Prof. O. Reynolds, and recently Prof. Hele Shaw has added some striking illustrations of the paths of the flow of liquids. Borda, in an almost forgotten, but remarkable paper (*Memoires de l'Académie Royal*, 1766), writes thus (when describing the conditions under which water flows by an opposing object):— "On imagine ensuit que les molécules du fluid, en s'approchant du corps, decrivent des lignes courbes, ou plutôt se meuvent dans les *petits canaux courbes.*" Borda goes on to show that theoretically the stream lines should flow round and again join in the rear of the object.

Thus the idea of stream lines and their behaviour was regarded as a matter of interest at an early date.

In a recent paper, in the *Bulletin des Séances de la Société Français de Physique*, 1902, M. Marey has added fresh information respecting the form of stream-lines, and by his new experimental methods he shows how air behaves as it flows by different shaped objects. In the first place he draws attention to his experiments on the movements of liquids in which he employed a stream of water, holding in suspension shining pearls of the same density as water; these were brightly illuminated by sunlight, a dark background being placed behind them; by means of a chronophotographic apparatus, a series of pictures of the illuminated parts was taken, their appearance in the picture being that of dotted lines. The direction and speed of the current which carried them along was by this means found.

When obstacles of different shapes were placed in the current the stream lines of the liquid were seen to bend in different ways and to form eddies. For example, in the case of water impinging against an inclined plane, the streams of liquid divide at a point, which appears to be the centre of pressure. In each case eddies form in the rear of the obstacle. The speed of the fluid, at any moment, could be recognised on the photograms by the degree of separation of the shining pearls, for photographed as they were, at equal times, they covered different distances in these equal intervals of time. A divided scale gave the lengths of these distances covered, while the rate of taking the successive pictures (ten per second) gave the speed of the current in its various positions.

By means of a method similar to this the direction and speed of the streams which form in a current of