in the plane of the sails, "it is possible, by a slight mental effort, to change the apparent direction of rotation, and back again."

A similar effect I have often observed, but it seems in no way dependent on the will. Look, for say 30 seconds, steadily at the revolving disks of an anemometer; they will soon reverse their apparent direction, whether you wish it or not. Continue still to gaze, and that reversed direction will be changed back.

All whom I have asked to try this experiment felt the effect to be involuntary. The changes take place not gradually or confusedly, but distinctly and with decision. The fact is plain; the explanation not so simple. HERCULES MACDONNELL.

4 Roby Place, Kingstown.

Earthquake Tremors.

PERMIT me to say that Mr. John Perry, in his criticism (October 2, p. 545) of my "Method of observing the Phenomena of Earthquakes," has assumed that the phenomena observed were due to vertical displacement; whereas they were probably due to a swaying of the building in which the observations were made.

This assumption seems also to have been made in the case of the man mentioned by Mr. Wire in your last issue (p. 593).

Marine Villa, Shanklin, I.W., H. G. DIXON.
October 18.

A Ball of Fire.

AT about 12.5 last night I was going through the street at Milverton, and saw a bright light about south of me. I saw also a bright ball of fire appear through a break in the clouds proceeding with great rapidity, at about the height of 45°, in a direction which I estimate to be from south to north-north-east; it disappeared behind a church, and I saw nothing more. I am told this may be of interest, and therefore forward the account to you. CHARLES RANDOLPH.

Milverton, Somerset, October 17.

HYDRAZOIC ACID—A NEW GAS.

A NEW gaseous compound of nitrogen and hydrogen has been obtained by Dr. Theodore Curtius, the discoverer of amidogen, and its nature and properties were described by him in the Chemical Section during the recent scientific meetings at Bremen. The composition of the gas is HN_3, and its constitution $H-N\langle^{N}_{N}\rangle$. It is, in fact, the hydrogen compound corresponding to the well-known diazobenzene imide of Griess, $C_6H_5N\langle^{N}_{N}\rangle$, the three nitrogen atoms being united in the form of a closed chain. The gas dissolves in water with great avidity, forming a solution which possesses strongly acid properties, and dissolves many metals, such as zinc, copper, and iron, with evolution of hydrogen gas and formation of nitrides, the metal taking the place of the liberated hydrogen. The derivation name of the gas, azoimide, is somewhat unfortunate in view of its strongly acid nature, and Prof. Curtius proposes the name "Stickstoffwasserstoffsäure." Perhaps the nearest English equivalent, open to the least objection, is hydrazoic acid—a name which will serve to recall the many analogies which this acid bears to hydrochloric and the other halogen acids.

In studying the reactions of his recently-discovered hydrazine (amidogen) hydrate, $N_2H_4 . H_2O$, Dr. Curtius found that benzoylglycollic acid, $C_6H_5CO-O-CH_2COOH$, was decomposed by two molecules of hydrazine hydrate, with elimination of water and formation of benzoylhydrazine, $C_6H_5CO-NH-NH_2$, and hydrazine acetic acid, $NH_2-NH-CH_2COOH$, in accordance with the equation—

$$C_6H_5CO-O-CH_2COOH + 2N_2H_4 = C_6H_5CO-NH-NH_2 + NH_2-NH-CH_2COOH + H_2O.$$

Under the influence of nitrous acid benzoylhydrazine forms a nitroso compound, $C_6H_5CO-N\langle^{NO}_{NH_2}$, which spontaneously changes into benzoyl-azo-imide, $C_6H_5CO-N\langle^{N}_{N}\rangle$, with elimination of water.

$$C_6H_5CO-NH-NH_2 + NO-OH = C_6H_5CO-N\langle^{NO}_{NH_2} + H_2O.$$

$$C_6H_5CO-N\langle^{NO}_{NH_2} = C_6H_5CO-N\langle^{N}_{N}\rangle + H_2O.$$

Benzoyl-azo-imide decomposes, upon boiling with alkalies, with formation of benzoate of the alkali and the alkaline salt of the new acid.

$$C_6H_5CO-N\langle^{N}_{N}\rangle + 2NaOH = C_6H_5COONa + Na-N\langle^{N}_{N}\rangle + H_2O.$$

When this sodium nitride is warmed with sulphuric acid, hydrazoic acid, $H-N\langle^{N}_{N}\rangle$, is liberated as a gas. The gas is decomposed by hot concentrated oil of vitriol; hence diluted acid requires to be employed, and the gas can thus only be collected in a moist state. HN_3 possesses a fearfully penetrating odour, producing violent catarrh, and dissolves in water with an avidity reminding one of hydrochloric acid. The solution also bears a surprising resemblance to aqueous hydrochloric acid; for, on distillation a concentrated acid first passes over, and afterwards a more dilute acid of constant composition. The aqueous solution possesses the odour of the free gas, and is strongly acid to litmus. With ammonia gas, hydrazoic acid gas forms dense white fumes of the ammonium salt, N_4H_4 or $NH_4-N\langle^{N}_{N}\rangle$, a compound which is completely volatile below 100°, and which crystallizes, but not in crystals belonging to the cubic system, in this respect indicating its different constitution to ammonium chloride. The aqueous solution rapidly evolves hydrogen in contact with zinc, copper, iron, and many other metals, even when largely diluted. As in the case of hydrochloric acid, the silver and mercurous salts are insoluble in water, the others being generally readily soluble. As the acid possesses feebly reducing properties, solutions of many of its metallic salts, the copper salt for instance, yield precipitates upon boiling of compounds of the lower oxides of the metals. The barium salt, BaN_6, crystallizes from solution in large brilliant anhydrous crystals. With silver nitrate the aqueous solution of the acid or a soluble salt yields a precipitate closely resembling silver chloride in appearance. Silver nitride, $Ag-N\langle^{N}_{N}\rangle$, does not, however, darken when exposed to light, and is further distinguished from silver chloride by its fearfully explosive properties. During the course of his description at Bremen, Prof. Curtius placed a quantity of this salt less than 0·001 gram in weight upon an iron plate, and then touched it with a heated glass rod. A sharp and loud detonation resulted, and the plate was considerably distorted. The mercurous salt, Hg_2N_6, is likewise very explosive. The metallic salts are readily converted into