Key to the Universe; or, a New Theory of its Mechanism. Founded upon a (1) Continuous Orbital Propulsion, arising from the Velocity of Gravity and its Consequent Aberrations; (2) Resisting Ethereal Medium of Variable Density, with Mathematical Demonstrations and Tables. By Orson Pratt, Senior. 'Second Edition. (Salt Lake City, Utah Territory, 1879.)

MR. ORSON PRATT'S work is not a text-book for students, but an application of dynamical principles to the system of the Universe. "The aim of the author is to vindicate the UNIVERSALITY of the law (*i.e.*, of gravitation); to rescue it from the environed limits sought to be thrown around it, and to give it that unlimited freedom of action which the distinguished name 'UNIVERSAL' so appropriately and definitely imports." Mr. Pratt states that astronomical science needs a theory which will answer as far as possible nine questions, which he propounds; the second is, "Why do planetary bodies rotate upon their respective axes? Why do they rotate from west to east, instead of the contrary direction? Is there any law governing their diurnal periods?" The ninth, "Will cometary orbits ever be converted into those of a planetary form?" "Unaided and alone, he launches his humble barque upon this great unexplored ocean, with a compass of his own invention." The discussion occupies thirteen chapters, and his investigations result "in the development of the following beautiful law: *The cube roots of the densities of the planets are as the square roots of their periods of rotation.*" Without making any long comments of our own we can say that Mr. Pratt's book gives evidence of much hard work and, it may be, of ingenious speculation, and we quote as appropriate to the work before us the following remarks of Prof. Newcomb ("Popular Astronomy," p. 233): "It is true that many ingenious people employ themselves from time to time in working out numerical relations between the distances of the planets, their masses, their times of rotation, and so on, and will probably continue to do so; because the number of such relations which can be made to come somewhere near the exact numbers is very great. This, however, does not indicate any law of nature."

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

The Recent Gas Explosion

THE explosion of the gas main in the neighbourhood of the Tottenham Court Road appears to be an example on a large scale of the phenomenon which occurs on the bursting of a eudiometer.

It is known (although I do not speak from experience) that when such an accident happens the glass gives way at the surface of the mercury in the tube, for at this point the explosion is most violent, in consequence of the gas being compressed by the explosion of that above it. When no accident takes place the flash of light is more brilliant at the surface of the mercury than in the upper part of the tube. In order to see if this fact would throw any light on the explosion of the gas main I tried a few experiments about a fortnight ago, an account of which may possess some interest. A piece of combustion tube 1.93 m. long and 13.75 mm. in diameter was closed at one end, and at 100 mm. from the open end of the tube a pair of platinum wires was sealed into the glass. The tube was filled over water with a mixture of hydrogen and oxygen obtained by the electrolysis of dilute sulphuric acid, and the mouth of the tube closed with a plug of wet cotton wool. The tube was placed on the lawn and secured to a heavy weight by a piece of string tied near the open end; a spark from an induction-coil was then passed

between the wires. The explosion of the gas blew out the plug of cotton wool and bent the platinum wires against the sides of the tube, but the glass was not broken. The tube was again filled with the mixed gases and closed with a cork, which was not forced tightly into the mouth of the tube. This time the tube burst in the middle, leaving .78 m. of the closed end and .59 m. of the open end without damage. The cork was projected some distance, but the wires were not bent by the rush of gas; the closed end of the tube was only slightly moved from its original position by the explosion.

Another piece of similar tube, but only about .88 m. in length, was next filled with gas and exploded in the same manner. The closed end was burst, and .475 m. of the open end remained. In this case the cork was also projected, but the wires were not bent. The experiment being made at night, it was noticed that the flash was much more brilliant at the closed than at the open end of the tube. A third tube of the same length as the first was next tried; the cork was blown out, but the tube did not burst. It was again filled and the cork forced in tightly, but it was again projected. The third time a block of stone was placed a few millimetres in front of the cork; this prevented its projection, but the tube did not burst, being apparently of thicker glass than the previous tubes. In the last three cases the flash was brilliant in the half of the tube towards the closed end.

The explanation of the experiments seems to be, that in the two tubes that burst the pressure produced by the explosion at a distance of about three quarters of a metre from the point at which the gas was fired was sufficient to overcome the resistance of the glass; and in the case of the long tube, which burst in the middle, the release of the pressure prevented the closed end from being destroyed. If the tube had been much longer there would probably have been another place where the violence of the explosion produced by the compression of the gas would have burst the tube.

The press of work at the end of the term has prevented my carrying the experiments farther, but I intend to try the effect of an explosion in a long lead or composition pipe, when I expect to find several swellings or burstings of the metal at the points where the pressure is greatest. When the experiments have been made I hope to be allowed to communicate them to you.

HERBERT MCLEOD

Cooper's Hill, July 24]

The Freshwater Medusa

IN NATURE, vol. xxii. p. 241, Prof. Lankester asserts that I had in a previous number (vol. xxii. p. 218) incorrectly represented him as holding that in *Limnocoelium* the radial canals terminate blindly, and as denying the presence of a marginal canal. In proof of my inaccuracy he makes the following statement:—

"A reference to NATURE, vol. xxii. p. 147, will show that in my first publication on the subject I gave as a character of the new genus, '*Radiating canals 4, opening into the marginal canal. Marginal or ring canal voluminous.*' I made the same statement in my communication to the Royal Society on June 17, and have not since deviated from it."

I have read the article to which Prof. Lankester here refers, and which was published on the date of the reading of his paper at the Royal Society. The only allusions in it to this subject are the following:—

"*RADIATING CANALS 4, terminating blindly at the margin of the disk.*"

"*MARGINAL or RING CANAL obliterated (or, if present, of very minute size).*"

GEO. J. ALLMAN

Storm Effects

THE storms about this part of Surrey have been lately local and violent, and the effects produced in some instances curious. Visiting a neighbour's farm on Wednesday evening (21st), we found a field of standing wheat considerably knocked about, not as an entirety, but in patches forming, as viewed from a distance, circular spots.

Examined more closely, these all presented much the same character, viz., a few standing stalks as a centre, some prostrate stalks with their heads arranged pretty evenly in a direction forming a circle round the centre, and outside these a circular wall of stalks which had not suffered.

I send a sketch made on the spot, giving an idea of the most