Charlemont. Facing the house, a stone's throw or two in front of the lawn, was a river called the Tall, which ran into the close-at-hand Callan, which again ran into the Black Water, which, in turn, emptied itself into that immense puddle which bears the name of Lough Neagh. The waters of Lough Neagh, unable, by reason of the obstructions in the Lower Bann, to escape rapidly enough into the sea, swell up and cause backwater in the rivers I have named, and others as well. The result is the periodic flooding of thousands and tens of thousands of acres of valuable land, to the immense prejudice of the occupants and country at large. The Tall, I should observe, was banked or dyked up on both sides. In some places, however, the dyke had given way, so that at flood-time—and it was flood-time at the period I speak of—the waters of the Tall were awash with those of the flooded meads on both sides. There was further a rapid current in the Tall, and before it merged into the Callan the stream had to pass under the arch of a bridge which it filled to the crown. In fact the battlements themselves were nearly covered, and the country, as far as the eye could reach from the position which I at the moment occupied at the foot of the lawn, wore the aspect of a sea. At this precise juncture two horses, whilom occupants, I presume, of the then flooded meads, were to be seen slowly wading in the direction of the Tall. The green summit of the dyke was for the most part visible, and upon this the poor brutes mounted, in quest, I suppose, of some outlet. They had not gone very far when, owing to the treacherous footing, one of the horses lost his balance and fell, rolling over and over into the Tall. He swam on bravely, the other horse stretching down at intervals a sympathising muzzle, making indeed repeated efforts to escape, but falling back each time into the surging current. I was alone, surveying the transaction, from which I never removed my eyes, with the deepest interest. All at once the horse that was on the dyke, keeping pace at a sort of half-trot with the other, burst into a hand-gallop, and when he had got sufficiently beyond his struggling comrade, bounded himself into the Tall. Swimming briskly onwards for a few fathoms, he then made his way out through what he must have seen beforehand was a practicable breach in the dyke, followed on the instant by his friend, evading, not a moment too soon, the submerged bridge, where they would have otherwise inevitably gone under. So long as my eyes could follow them they dashed onwards at a gallop, throwing up their exultant heels and flourishing their tails across the flooded meadows. It is now many years since I beheld this astonishing spectacle, which my memory recalls as freshly as if it had happened yesterday, awakening, as I think it is well calculated to do, serious reflections in regard of our mysterious associates and the wondrous Power which has called them into being, and now sustains them and ourselves alike in this transitory state which we term life. HENRY MACCORMAC

Belfast, August

Radiation.—A Query

IN Baily's experiments with the torsion-rod and two leaden balls weighing 380½ pounds each, it was found that the radiation of heat from the leaden masses affected the vibrations of the torsion-rod. These masses were thereupon gilded, and the torsion-rod protected by a gilt box covered with thick flannel, and the disturbing influence overcome. How did radiation affect the motion of the torsion-rod? F. G. S.

"On a Mode of Explaining the Transverse Vibrations of Light"—The Expression "Radiant Matter"

WITHOUT wishing at all to underrate the apparent difficulty noticed by your New Zealand correspondent, Mr. J. W. Frankland (NATURE, vol. xxii. p. 317) in regard to my paper under the above heading (NATURE, vol. xxi. p. 256), as it would be against the interests of truth to do so; I may nevertheless call his attention to a letter of mine (NATURE, vol. xxi. p. 369), where an attempt is made to meet the difficulty in question. The point is to account for the circumstance (admitting that it is rendered necessary by physical evidence) that the velocity of propagation of gravity must, at least, be very much greater than that of light. I will merely confine myself here to recapitulating one of the main conclusions in a somewhat different form, viz., it appears to be necessary to look to a separate medium for gravity, or (more accurately) to *one* medium with particles of two grades of dimensions; the one set of particles having very minute mass, and consequently enormous velocity, and concerned in the effects of gravity; the other set, of much greater mass and slower velocity, concerned in the phenomena of light. It will, I think, be so far tolerably evident that if the *number* of the more minute set of particles be comparatively very great, the pressure produced by them would be correspondingly great, and therefore these particles would be mainly (*i.e.*, almost exclusively, if their number were sufficiently great)[1] concerned in producing gravity. On the other hand, on account of the extreme velocity of these particles, they could not apparently be appreciably concerned in the phenomena of light, since the molecules of gross matter would vibrate among them without appreciable resistance. For it is a well-known dynamical fact that the resistance opposed to the motion of a body in a medium *diminishes* as the velocity of the particles of the medium increases. It may be worth observing perhaps that this idea of three grades of dimensions in matter (viz. gross matter, light-carrying matter, and gravific matter) appears to be an old one. Thus a book was published in 1827 by Dr. Blair, formerly Regius Professor of Astronomy in the University of Edinburgh, entitled "Scientific Aphorisms" (to which my attention was called by Prof. Tait), where the idea of three grades of dimensions in matter is set forth, and a theory of gravity very similar to that of Le Sage expounded. Also M. Prevost ("Deux Traités de Physique mécanique") expresses, I believe, the view that matter exists fundamentally in three grades of magnitude.

It may be rather a curious fact to notice that if the theory, that the æther consists merely of finely sub-divided matter in the ultra-gaseous state, light being regarded as a vector property carried off by the atoms in their passage through the open structure of the vibrating molecules of gross matter, as suggested by the late Prof. Clerk Maxwell, article "Æther," new edition of the "Encyclopædia Britannica" (*i.e.*, with range of free path greater than planetary distance, NATURE, vol. xxi. p. 256),[2] should ultimately turn out to be substantially true; then the term "radiant matter," employed by Mr. Crookes in connection with his experimental researches, would have its practical application in nature on a large scale—or light would be actually propagated by "radiant matter." If, on an examination of the theory in that spirit of good-humoured impartiality representing entire freedom from the predilections of any school of thought (the best guarantee of truth)—the difficulties attaching to it should not be considered insurmountable; then it may be worth remarking that the theory, without violating in the least the essential principles of the firmly-established undulatory theory, contains nevertheless (in its corpuscular essence) *one* of the ideas of Newton; so that it would appear that the latter might not have been entirely wrong, nor the upholders of the opposite view completely right, but that a partial reconciliation of their rival ideas might be possible. S. TOLVER PRESTON

London, August 10

Earthquake in Smyrna

ACCOUNTS are freely coming forward, but they are of popular interest, seismological details being scanty. I must premise that in 1862 I took great interest in promoting Abyssinian wells in Smyrna, and that large numbers were put down. When the French Company built the quay the new works there were similarly supplied, and the result has been that for some years the surface and pipe-wells in the parallel Marina and Frank Streets have been wanting in water.

Within a few hours after the earthquake it was noticed that both classes of wells, say 600 feet from the sea, were freely supplied with water. This fact appears to me deserving of record.

It is said that the earthquake was most felt near the Greek Cathedral of St. Photius, at the Three Corners in Frank Street. It was here the ground opened in the last century earthquake and swallowed up two men, as I heard by tradition; and I always walked across the churchyard in full remembrance.

Of late years some kind of a landslip took place on Mount Pagus, or the Castle Hill, where Alexander the Great fell asleep.

[1] It may be worth noting in connection with this that (according to a principle developed by Sir W. Thomson, *Phil. Mag.*, May, 1873) it appears that if the "elastic rigidity" of the *larger* particles were such that they suffered no appreciable diminution of velocity at rebound from gross matter, they would not be appreciably concerned in the effects of gravity (even if their number were comparable to that of the smaller set of particles).

[2] Also previous papers by the present writer (on the same subject)—*Phil. Mag.*, September and November, 1877, February, 1878, April and May, 1880.