sociated with the other probable causes of tubercle, and it is difficult to give instances where tubercular consumption has made its appearance whilst perfectly pure air is continually breathed. But, we think, various considerations render Dr. MacCormac's views untenable. We will not refer to Iceland or to the inhabitants of the elevated plains of the Andes, or of the Steppes of Asia—all of which are sad stumbling-blocks in his way—because, as he says, they are so far off, and our facts in regard to the frequency of tubercle in these regions are perhaps not quite satisfactorily ascertained. But we may call attention to the circumstance that the disease is more common in England than in almost any other country—than in France, for example; yet, surely, the hygienic relations in regard to ventilation are superior in England to those existing on the other side of the Channel.

If air that has been breathed is so certainly the cause of tubercle, the poor population of London and other large towns should not only be decimated, but should be swept off *en masse*, for they all breathe through the night, and through a great part of the day, air so contaminated. Once more, how is it that one member of a household belonging to the upper class is attacked and dies, though all the rest, notwithstanding their being exposed to the same conditions, are preserved? Looking at animals, again, any Indian medical officer will tell Dr. MacCormac that monkeys kept in confinement, though they have never had a roof over their heads and have consequently never breathed air a second time, will die with their lungs stuffed with tubercle. Lastly, the evidence is very strong in favour of Virchow's view, that tubercular matter is originally composed of cells resembling the white corpuscles of the blood, which are either modified white corpuscles, or, as Virchow himself maintains, proceeds from the prolification of connective tissue corpuscles. Whilst disagreeing, therefore, with Dr. MacCormac in regarding the breathing of air imperfectly freed from the products of previous respiration as the exclusive cause of tubercle, we may fully endorse his views upon the desirability of thorough and complete ventilation, especially in our sitting-rooms and sleeping apartments. The exigencies of modern civilisation seem to lead unavoidably to the close herding of mankind; but we confess it is with a sigh of regret that we see year by year long lines of close-packed houses, springing up on what were but recently green fields on every side of this great metropolis. To reach green fields and breathe fresh air is now a day's work.

H. POWER

Theory of Friction. By John H. Jellett, B.D., P.R.I.A. (Dublin: Hodges and Co.; London: Macmillan)

THIS book is, to a certain extent, of the character of a supplement to ordinary treatises on mechanics. It deals with the question of friction by the use of analytical expressions very general in the possibility of their application, on which account perhaps some of the significance of their physical character may be apt to escape the general reader, and the book is thus, perhaps, rather more suitable for advanced than for junior students.

The author brings well into prominence the radical difference between problems in statical and dynamical friction, namely, that the latter are determinate, whereas the former are not necessarily so. He says:—

"When a system of material particles, each of which rests on a rough surface, is subject to the action of external forces, it will in general be found that, of these particles, some will be in a state of motion and others in a state of rest. Everything connected with the moving particles, namely, their positions, their velocities, and the forces, geometrical and frictional, which act upon them, is fully determined by means of the dynamical and geometrical equations. The geometrical and frictional forces which act upon the quiescent particles will also be determinate, unless it be possible to form by elimination one or more equations between the co-ordinates of the quiescent particles *only*. If this *be* possible, the geometrical force replacing every such equation will be indeterminate in intensity."

The character and cause of the analytical indeterminateness in the case of statical friction is enunciated in the following words, which obviously apply also to forces not frictional:—

"If any one or more of the forces acting upon the particles of a system be not determinate functions of the co-ordinates, the number of the unknown quantities will exceed the number of equations, and there will be in general an infinite number of positions satisfying the conditions of equilibrium, disposed in one or more groups, in each of which these positions succeed one another continuously."

There is an interesting chapter on the distinction between necessary and possible equilibrium, arising, so far as friction is concerned, from the fact that the coefficient of dynamical friction is less than that of statical friction, so that "if the system be disturbed from its position of equilibrium by the communication of infinitely small velocities to its several points, when the friction at each point will, of course, become dynamical, a finite force tending to augment the displacement may at once be developed at some or all of these points." The whole point of distinction between this and ordinary unstable equilibrium, when friction is not taken into account, consists in the fact of the infinitely small velocity calling into play a finite force, which it would not do in the case of ordinary unstable equilibrium, in the lapse of a finite time. Without questioning the analytical excellence and interest of the investigation, we may hesitate in adopting the change from statical to dynamical friction as a consequence of the assumption of an infinitely small velocity. We would point to the following problem (page 170) as a good example of the concrete application of the principles of the treatise:—"Two rods, AB, CD, firmly jointed together at B, rest so that A presses against a rough vertical surface, and CD lies on a rough peg in the same vertical; find the limiting positions and the nature of the equilibrium."

At the end of the book there are several problems worked out, namely, the well-known problem of a top spinning on a rough plane, the problem of "friction wheels," and one or two problems connected with the driving wheels of locomotives. J. S.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

The Adamites

I SHOULD not have noticed the letter of "M. A. I.," which appeared in the last number of NATURE, with reference to my paper on "The Adamites," were it not that my silence might be interpreted as an acknowledgment of the justice of the remarks of the anonymous writer. If I had been silent, however, I trust your readers would have had more sense than to accept the dictum of a writer, anonymous or otherwise, who thinks to negative the conclusions of a paper, written at least in a truly scientific spirit, by such nonsense as the reference to *Paddy* and *Taffy*. One looks for reasoning in the criticisms which appear in such a journal as NATURE, and not for a misleading statement of an opponent's position, supported by reference to general conclusions and the use of weak satire. When "M. A. I." condescends to advance an argument, I shall be happy to consider it; and if it should be unanswerable, I shall not hesitate to admit it to be so. Doubtless I ought to feel thankful for the tenderness with which he has trodden on my toes, but I have scant regard for mere courtesy where questions of science are at stake; and in the interests of truth I would rather that the errors of my