THE USEFULNESS OF EARTHQUAKES.

We have lately had fearful evidences of the energy of the earth's internal forces. A vibration which, when considered with reference to the dimensions of the earth's globe, must be regarded as a minute quivering, has been sufficient to overthrow cities, to cause the death of many human beings, and to destroy property estimated at millions of dollars. Such a catastrophe as this serves to shew how poor a creature man is, in the presence of the grand workings of nature, and how his strongest buildings crumble into dust with the mere throes which accompany her unseen subterranean efforts. In the face of this, it may seem a paradox to assert that earthquakes are essentially preservative and restorative phenomena, yet such is the case. Had no earthquakes taken place, man would not now be inhabiting the earth; were there none to take place in future, his term of existence would certainly be more limited than now seems likely. There can be no doubt that at one time in this world's history, no land was visible above the surface of the water. In this state of things nothing but the earth's subterranean forces, could produce continents and islands; however, once they were formed a struggle began between them and their great enemy water; now, water works the destruction of land in two different ways. In the first place, the sea tends to destroy the land by beating against its sheres, and thus continually washing it away. It may seem at first sight that the process must necessarily be a slow one, but we must bear in mind that we never have an opportunity of observing the full effects of this cause, as its action is always limited by opposing forces. Many instances of the sea's power of effecting the rapid destruction of land exist, notably on the coast line of Great Britain. Lyell relates a case where along the shores of Norfolk and Suffolk the decay had been so rapid that there was depth of water sufficient to float a frigate, at a point where fifty years before there stood a high cliff with houses upon it. Now this disintegration of land is proceeding, not only along the shores of Great Britain, but also of every country on the face of the earth. Here and there are instances where a contrary process seems in action—low-lying banks or shoals are formed,—but when we examine these, we find they are but fresh proofs of the destructive powers to which the land is subject, for they invariably consist of the *debris* of other coasts. Now there can be no doubt that of earth which is washed away by the action of the sea, by far the larger part finds its way to the bottom, a small portion only is brought to aid in the formation of this new land. Consequently the larger the shoal the larger must be the amount of land carried away never to reappear. If, therefore, we suppose the destruction of land to go on unchecked, it is apparent that at some time or other, the formation of these banks and shoals must come to an end, owing to the fact that the land from which they were supplied will have ceased to exist.

We now come to the second cause of the washing away of the land. Perhaps by some it will hardly be supposed that rain could have an appreciable influence on the demolition of continents. Still, such is the case, and it is sufficiently proved by the enormous deltas which have formed at the mouths of many rivers—in other words the actual growth of land through the effects of rainfall—is a proof how largely this cause must tend to destroy the interior of continents. We see then the necessity there is for some restorative force to counteract the destructive effects indicated above.

Now these effects are brought about by a levelling action, therefore the form of force necessary to counteract them must be one which tends to produce irregularities in the surface of the earth, and this can only be accomplished by upheaval and depression of the earth's crust. Thus, the very factors we require, are found in the earth's subterranean forces. In the first place, their action is not distributed with any approach to uniformity, hence, they are not likely to give to the earth's surface the figure of a perfect sphere. But more than this, it is known that the forces of upheaval act more powerfully under continents, while those of depression are most liable to effect the bed of the ocean, and as one cannot act without the other a balance is preserved. Of the effect of these forces in altering the level of the land there are many instances. They can best be observed in such countries as Chili and Peru where earthquake shocks are of frequent occurrence. In the former of these places a succession of shocks raised the whole coast line to the height of several feet, and at the same time caused a perceptible recession of the sea, and Darwin relates that in the Andes he saw beds of sea shells belonging to a recent species at a height of a quarter of a mile above the present sea-level. One of the most extraordinary of these upheavals on record, took place at Cutch in India, where a tract of country upwards of forty miles in length, was raised to a height of ten feet.

In these and other changes are we reminded of the great forces at work beneath the earth's surface, on every side we see nature's plastic hand modelling and re-modelling the earth in order, that it may be a fit abode for those who are to dwell upon it.

CORRESPONDENCE.

DEAR SIR:—I should be very glad to see a much-needed reform, introduced this year, viz., a "cloakroom" for non-resident students. At present I, as a non-resident, am obliged to keep my gown, surplice, &c., in a friend's room, when I am not at the college, and I have to keep my hat, coat, &c., there when I am at the college. This arrangement works very well when one has a friend, but a stranger has a natural objection to imposing on men, on whom he has no claim. Further, if I keep my gown, &c., in my friend's room, he may possibly go out and lock his