

W., the amount of elevation always increasing as we proceed towards the North Cape, where it may equal 5 feet in a century. If we could assume that there had been an average rise of $2\frac{1}{2}$ feet in each hundred years for the last fifty centuries, this would give an elevation of 125 feet in that period. In other words, it would follow that the shores, and a considerable area of the former bed of the Baltic and North Sea, had been uplifted vertically to that amount, and converted into land in the course of the last 5000 years. Accordingly, we find near Stockholm, in Sweden, horizontal beds of sand, loam, and marl containing the same peculiar assemblage of testacea which now live in the brackish waters of the Baltic. Mingled with these, at different depths, have been detected various works of art implying a rude state of civilization, and some vessels built before the introduction of iron, the whole marine formation having been upraised, so that the upper beds are now 60 feet higher than the surface of the Baltic. In the neighborhood of these recent strata, both to the northwest and south of Stockholm, other deposits similar in mineral composition occur, which ascend to greater heights, in which precisely the same assemblage of fossil shells is met with, but without any intermixture of human bones or fabricated articles.

On the opposite or western coast of Sweden, at Uddevalla, post-pliocene strata, containing recent shells, not of that brackish water character peculiar to the Baltic, but such as now live in the northern ocean, ascend to the height of 200 feet; and beds of clay and sand of the same age attain elevations of 300 and even 700 feet in Norway, where they have been usually described as "raised beaches." They are, however, thick deposits of submarine origin, spreading far and wide, and filling valleys in the granite and gneiss, just as the tertiary formations, in different parts of Europe, cover or fill depressions in the older rocks.

It is worthy of remark, that although the fossil fauna characterizing these upraised sands and clays consists exclusively of existing northern species of testacea, yet, according to Lovén (an able living naturalist of Norway), the species do not constitute such an assemblage as now inhabits corresponding latitudes in the German Ocean. On the contrary, they decidedly represent a more arctic fauna.* In order to find the same species flourishing in equal abundance, or in many cases to find them at all, we must go northwards to higher latitudes than Uddevalla in Sweden, or even nearer the pole than Central Norway.

Judging by the uniformity of climate now prevailing from century to century, and the insensible rate of variation in the organic world in our own times, we may presume that an extremely lengthened period was required even for so slight a modification of the molluscos fauna, as that of which the evidence is here brought to light. On the other hand, we have every reason for inferring on independent grounds (namely, the rate of upheaval of land in modern times) that the antiquity of the deposits in question must be very great. For if we assume, as before

* Quart. Geol. Journ. 4 Mem. p. 48