

more advanced stage in a similar land-forming process. Into that western bay the river Toce, whose valley forms the southern approach to the Simplon Pass, empties its waters, laden with the detritus of the glaciers and torrents of the great Alpine range from Monte Rosa to the Monte Leone. Now, the Toce, like the Maggia, enters the western bay sideways; and the fan of mud which it has deposited at its mouth has therefore at last succeeded in cutting off the end of the bay entirely from the main lake. The smaller sheet of water thus isolated is known as the Lago di Mergozzo; and it is separated from the rest of Maggiore by a low and muddy plain, through which a sluggish river empties its waters with slow meandering into the main basin. But if, from the summit of the neighbouring Mont Orfano, you look down upon the two lakes, the greater and the lesser, you can see at once, by the continuity of the mountain outline, that they were formerly both one; while the shallow sheet of alluvium that separates them sinks at once when seen from that height into its proper insignificance as a mere mud-bank.

The well-known view of the eastern end of the lake of Geneva from the platform at Glion still further impresses the mode of action of these torrent streams in filling up lakes with an alluvial mud-sheet. Observed from that point, it is quite clear to the most untrained eye that a long arm of the lake once extended right up the Rhone valley as far, at least, as Bex and St. Maurice, while other subsidiary lakes apparently occupied the flat bottom about Martigny and Sion. But the mass of mud brought down by the glaciers and streams on either side from the Alpine range and the Bernese Oberland has now succeeded in covering the whole of this vast arm with a flat and level mud-sheet, which on the low shore between Villeneuve and Bouveret is yearly spreading itself further into the lake with marvellous rapidity. There can be little doubt that in time the Rhone deposits will fill up the whole lake of Geneva, as the Ticino will fill up the bed of Maggiore, the Adda that of Como, the Oglio Iseo, and the Sarca Garda.

But when, from the narrow theatre of the lakes and mountains, one emerges upon the broader scene of the Lombard plain—that interminable plain of poplars and vines that stretches from Turin in one monotonous level down the valley of the endless Po to Venice and Ravenna—it comes upon one with a burst of personal realisation that this, too, is one gigantic mud-sheet; that rivers can fill up, not only lakes and minor bays or tarns, but vast gulfs and branches of the sea as well. It is quite clear that in the beginning of the recent geological period, the skeleton (so to speak) of Upper Italy consisted only of the Alps and Apennines, while a mighty bay, almost comparable in size to the Adriatic (which is, in fact, its lower still unstilted portion) spread up to the very base of the two mountain ranges. But into this bay the rivers and torrents of the twin mountain systems brought down their mud with ceaseless activity, gradually filling it up with alluvial detritus. Step by step the rivers won upon the bay, at first, no doubt, as distinct streams, each with its own minor delta; but at last they almost all united in the single central channel of the Po, which at present carries off the joint waters of the Ticino, the Adda, the Adige, and the Mincio. Even now, however, the Brenta and a few other Alpine streams have separate outlets; and their mud must fill up a good deal more of the Adriatic before they succeed in joining the Po some forty or fifty miles east of its existing debouchure. But in the long line of marshes, sand-banks, and islets which spread from Venice along the coast to Comacchio and Ravenna, we see this process of gradual silting up now actually in action and daily increasing.

And what is thus taking place on a comparatively small scale before our very eyes in the Po valley, has taken place, and continues to take place, in a vastly greater way over the valleys of the Nile, the Ganges, and the Mississippi. India, for example, at the dawn of the modern period, consisted only of a vast island, the Deccan, bounded on the north by an arm of the sea, which spread from the Indian Ocean to the Bay of Bengal, and from the base of the Himalayas to the base of the Vindhya. But the rivers which flowed from the mountains on either side have gradually filled up the whole of the intermediate sea with those vast alluvial deposits which we now know as the Ganges and Indus valleys; while the Ganges especially is still increasing its delta and carrying huge floods of Himalayan *débris* into the Bay of Bengal with astonishing and almost incredible rapidity. The eternal hills are for ever being ground down by rain or glacier, and the material thus produced is for ever being deposited by rivers in arms of the sea to form those immense alluvial plains which are the chief seat of human population.—MR. GEORGE GRANT, in *Knowledge*.

THE STREETS OF OUR GREAT CITIES.

To the thoughtful American, visiting Europe for the first time, nothing seems so strange as the different condition under which people lived in the cities of the past, as compared with the cities of the present. In the former, the wall of a city was an invariable accompaniment—a hard and fast line having no elasticity, so that if the population grew, as populations did grow, even in the centuries that have passed, the people could only provide for the increase by squeezing more closely together. They were not even permitted to build upon the country outside the wall, within the distance of a league, as buildings would have rendered the wall useless as a protection—the land might be cultivated, but that was all.

Even the space that was allowed for streets—passages, we should call them—was begrudged by the inhabitants, who built their houses with such projecting upper storeys, that the occupants could almost shake hands across the narrow way.

And, as for the pavement, once down, it seemed to last forever. It had but little wear and tear other than that of the foot-passenger; there were no water or gas pipes to be placed beneath its surface, no telegraph poles to obstruct its sidewalks.

But with the cities of the present how changed. There are no walls to mark a limit to their growth, their inhabitants pride themselves upon the width of their streets, they boast of their length, while below their surface is such a network of pipes conveying water, gas and steam, and wires for the electric fluid, as would amaze the people of the past. Even their merchants, instead of living in small rooms above their places of business, seek, when the day's labor is accomplished, to get as "far from the madding crowd's ignoble strife" as possible.

But with this change, comes the great problem: How can these men of business get to and from their places of business, and their homes, with the greatest expedition to themselves and the least obstruction to others? and how can the water and other pipes—the necessities of civilization—be placed in position and kept in repair without injury to the surface of the streets?

In the great city of London, as most of our readers are aware, the former difficulty was sought to be overcome by the construction of the underground railway. But this required an enormous outlay. Steam was the recognized motive power; but the steam engine requires a smoke-stack, and space above for the escape of the smoke and steam, and for this a greater depth