

into everything, and yet they combined it with a coolness and presence of mind which never failed them in the most desperate emergency. They hunted for months, season after season, in the country of hostile Indians, jealous of the white intruders on their hunting-grounds, and as keen as quick to read their "sign." A broken twig or a crushed blade of grass might be enough to betray them. They launched their frail canoes on the streams, shooting down the rapids, and risking shipwreck among rocks and snags, knowing that the water left no trail. Yet each thicket might shelter the lurking enemy, and they paddled with each sharpened sense on the alert. The flight of a wild duck, a strip of bark floating on the river, or the sudden plunge of the otter or the muskrat round a wooded corner, was enough to give the alarm. They knew no mercy, as they felt no fear, and neither gave nor expected quarter. Had we never read Washington Irving, we should have found far less enjoyment in the delightfully sensational romances of Mayne Reid; for we always like to think fiction credible. But even when Reid is giving the rein to his imagination, he can hardly overcolour such experiences and exploits as those of the exploring pioneers of the rival fur companies—of Captain Barneville and his determined followers. There can be no doubt as to Cooper's idealizing the red man, for he made him impressionable to all the softer passions, and he painted a noble type of barbaric chivalry in Uncas, the last of the Mohicans. The real Indian was a very different being, as we learn by reference to the more matter-of-fact volumes of Catlin. Nevertheless, and not only to boys, Cooper's novels in this way are unapproachable. But they should be as familiar as that preliminary epistle in "Marmion" which we did not venture to quote. Sensation follows on sensation, and each strong situation has a satisfactory termination, save occasionally when there is a touching but natural piece of tragedy. We lose ourselves with the scout and his comrades in the woods, alarmed at the terrors which threaten each step in advance, but confident in the instincts and courage of our guides. In log forts or lumbering scows, in bark-canoes on the rivers, or in small craft on the great lakes, we are beset by all manner of mortal perils. And we have an epitome of the whole range of border adventure and frontier history in the graphic and vivid biography of Mr. Bumpo, from the days when, in the high lands between the Hudson and the Canadas, he won from the Mingoes his name of Hawkeye, and from the French his sobriquet of "Lalongue Carabine," to his last appearance on the Western prairies, a superannuated trapper, with a toothless hound.—*Blackwood's Magazine*.

WORLD-RENOVED AQUEDUCTS.

THE approaching celebration of the opening of the new Croton Aqueduct will suggest comparisons with other famous water-works of ancient and modern times. It is an interesting fact that, to this day, Athens is partly supplied with water by conduits planned under the rule of Pisistratus in the sixth century B. C. The system of tunnels and underground pipes, which conveyed water to Syracuse in the fifth century B. C., and which, according to Thucydides, was partly destroyed by the Athenians, still supplies the wants of the modern town, and the tunnel passing under the sea to the island of Ortygia bears witness to the engineering capabilities of the countrymen of Archimedes. The great masters, however, of aqueduct construction were the Romans. In the time of Marcus Aurelius, Rome was supplied with water by no less than fourteen aqueducts. The chief of these were the Aqua Claudia and the Anio Novus Aqueducts, respectively forty-five and sixty-two miles distant from the city, thenceforth travelled together in two distinct channels, one above the other, supported by a chain of arches attaining at one place the height of 109 feet. Of the fourteen aqueducts required by ancient Rome, three, including the Aqua Claudia, suffice for the needs of the modern city. The aqueduct bridges, or arched walls which traverse the Campagna, are not the tallest structures of the kind reared by the Romans. The Pont du Gard near Nîmes consists of three rows of arches, and the vaulted water-course, which surmounts the topmost row, is 180 feet above the ground. We may here remind the reader that the High Bridge over the Harlem River is 114 feet above high water mark, and 1,460 feet long. The principle bridge of the aqueduct of Antioch was only 700 feet long, but it was 200 feet high. The aqueduct bridge of Segovia in Spain, also built by the Romans, is 2,400 feet long and 102 feet high. The aqueduct near Spoleto, built by the Byzantines in the seventh or eighth century, is 300 feet in height. At Mayence are the ruins of a Roman aqueduct, 16,000 feet long, and carried on from 400 to 600 pillars. The Pyrgos, or Crooked Aqueduct, still serves to convey to Constantinople the waters of a valley situated on the heights of Mount Haemus, fifteen miles from the city. One section of this aqueduct is composed of three rows of arches, one row above another, which are collectively 106 feet in height. One of the most remarkable works of the kind constructed in modern times is the aqueduct-bridge of Maintenon, erected for the purpose of conveying water from the river Eure to Versailles. It consists of three rows of arches, one above another, and is 200 feet high by five-sixths of a mile in length. The conduit that supplies Marseilles with the water of the Durance is about sixty miles in length, and one of its aqueduct bridges is 262 feet high. The length of the conduit which brings water from Kaiserbrunn to Vienna is fifty-six and a-half miles, but the tallest of its aqueduct bridges

is only about ninety-six feet. The main Paris aqueduct is a little over a 110 miles long, and, with its subsidiary conduits, compelled the construction of seventeen bridges. Whether we look at the cost of construction or at the amount of water deliverable, the new Croton Aqueduct surpasses every other structure of the kind. It is estimated that the new Croton Aqueduct alone will be able to supply a population of 2,120,000 with an allowance of 150 gallons a day per head. With the addition of the old aqueduct and the Bronx River pipe-line, the total capacity of the city's water-works will be 150 gallons a day per head for population of 2,873,000.—*New York Ledger*.

GLACIERS.

IN high valleys, among the mountains whose tops are covered with perpetual snow, are often found seas of ice, called "glaciers." They are formed thus: Snow that falls upon lofty mountains melts very little even in summer. So in valleys high up among the mountains it gathers to a great depth, and, from the weight of the snow lying above, the lower layers become icy, as a snowball does when squeezed. The upper crust melts a little during the heat of the day, and the water sinks down through the snow, and then freezes at night. From this melting and freezing the mass of snow is soon changed into a sea of ice. Remember that when water freezes, it expands. If we fill a bottle with water and let it freeze over night, in the morning we find that the bottle is cracked by the swelling of the ice. So it is with the water that forms glaciers. When it freezes, it stretches, and pushes its way down in whatever direction the valleys slope. Glaciers of to-day are much smaller than the ice-seas of long ago, but still, in studying them, we learn to understand the old glaciers. In travelling down valleys those ancient glaciers left traces of their journey. Over all the places where the ice-seas passed the rocks are rounded and highly polished. A field of these rounded rocks, when seen from a distance, looks like a field filled with sheep crouching on the ground, and Swiss geologists have called them *roches moutonnées*—"sheep-like rocks." In a valley along the summit of the Rocky Mountains, near the "Mountain of the Holy Cross," there is a beautiful display of these polished, rounded rocks. As the glaciers moved down the valleys, great rocks, frozen fast in the ice on the sides and at the bottom, scratched and marked other rocks as they passed by and over them. Sometimes these scorings are very broad and deep, for the immense rocks the glaciers carried were like strong, powerful tools in the grasp of a mighty engine; sometimes the lines are as fine as those of a fine engraving. They usually run all one way, and by looking at the direction in which the lines run, one can tell the direction in which the glacier moved. In the sandstone west of New Haven, Connecticut, the deep, broad scorings can be plainly seen, running toward the south-east. The height at which these scratches occur tells us something of the depth of the ice. Markings in the White Mountains indicate that the ice was more than a mile deep over the region now known as northern New England.—*Teresa C. Crofton, in November St. Nicholas*.

HOW SUICIDES ARE MADE.

IT is commonly believed that the tendency to suicide, like the tendency to madness, runs in families, and that is no doubt true. But the strongest-minded and clearest-headed man in the world has the possibility of suicide in him. On the other hand, the disposition to madness and suicide, which is so decided a characteristic of some families, is, in many cases, easily to be kept at bay by resolution and intelligence on the part of particular individuals. So that, in most cases, if the story of a suicide be read from the very beginning, the full responsibility must be placed on the victim himself. In our own time the pressure of highly civilized environment urges men in the direction of brain weariness and so of disgust with life. But it is to be borne in mind that no man is compelled to enter into the keenest competition of his age. The brain is fairly mature before the age of twenty-five; and before that age few educated men are married, and fewer still are irrevocably committed to a particular calling or way of life. A young man of average intelligence is then quite able to judge his own intellectual force and staying power, and he is also able to take into consideration the history of his family and his inherited tendencies. It is incumbent upon him at that stage to take stock of his mental and physical resources exactly as he takes stock of his capital. If his available money amount to no more than one or two thousand pounds he would consider himself a madman were he to embark in a business requiring a capital of half a million. But is he not just as much a madman if, with a mind of merely average powers, he enters upon a line of life requiring an intellect of the strongest and clearest order and mental endurance of the most persistent kind? A young man acting thus invites brain worry, invites chronic dyspepsia, invites sleeplessness; throws the door wide open for the entrance of all the physiological foes that destroy health and drive sanity out of the home.—*The Hospital*.

THE wig in former times was considered an important part of the insignia of a physician. Even in the last century, so much consideration was attached to it, that Dr. Brocklesby's barber's boy used to carry a handbox through High Change exclaiming: "Make way for Dr. Brocklesby's wig."

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