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SCIENTIFIC AMERICAN SUPPLEMENT

No. 1035.

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THE ISLES OF SHOALS.

Attention is called to an interesting article by Dr. Horace C. Hovey, in this week's SUPPLEMENT, announcing recent discoveries concerning the Isles of Shoals. This picturesque group is nine miles from Portsmouth, and includes nine small islands, five of which belong to Maine and four to New Hampshire. Although discovered in 1614 by Captain John Smith, and visited by thousands of tourists, their geology has been neglected. After briefly giving a few historical facts, Dr. Hovey tells what he found during his explorations among the rumpled and twisted rocks of this group. There are proofs that Star, Haley, Cedar and Malaga islands are undergoing a process of elevation, having risen six feet within fifty years. Potholes that once were at tide level and used by the fishermen as basins for cleaning fish are now a hundred feet back from the sea, and six feet above the ordinary tides. The channel between these islands was formerly six feet deeper than it now is. The petrography of the islands has only been partly worked out; but the signs of igneous action are impressive. Dikes of diorite and gneiss and seams of quartz and feldspar run in every direction. The trap rock yields more readily to the action of the sea than do the granitic rocks, and on being worn away leaves channels through which the waves rush with violence. In some cases the work is not yet complete, and the huge basaltic blocks lie like gigantic stairs, thus justifying the etymology of trap from "trappa," meaning steps.

A remarkable column on Appledore Island is described that is eleven feet in diameter, and that must once have been as much as twenty-five feet high, but now has been singularly sliced off by the waves. In shape it is sharply hexagonal. The rock is light colored granite crushed and baked, and protrudes from a mass of black gneiss, beyond which are walls of white granite. It is an altogether unique occurrence.

The violence of the waves that beat about these islands would seem incredible, were not so many proofs at hand. Some of them are given. The Laightons, who own most of the islands, built a wall to protect their Appledore hotel. The wall was six feet high and six feet thick. But a single winter storm broke it down and scattered the stones in every direction. Last winter a storm carried great bowlders completely across the islands. A bowlder weighing many tons was tossed by the waves and lodged on the cliff of White Island fifty feet above the sea level. The lightning has also done its share in the work of demolition. Glacial action has been powerful. These causes combined, glacial, aqueous, igneous and electrical, have rent these islands apart, severed them from the mainland, and comminuted their rocks into the masses of sand now piled up as dunes about the mouth of the Merrimac.

THE RAILROAD ACROSS SIBERIA.

The Russian government is displaying an activity in prosecuting this great enterprise which makes it certain, not only that it will be completed, but that it will be completed before the date originally arranged.

Before the close of this year the road will be opened as far as the River Obi. It will then be possible in the Old World to take a continuous journey from the Atlantic eastward of over 4,000 miles. It is probable, judging from the present rate of progress, that, by the opening of the twentieth century, a continuous belt of steel will stretch from Paris to the Pacific.

It has already been suggested—and, as the Siberian road approaches the Pacific Ocean, the matter will receive increasing attention—that it would be possible to extend our American system of roads northeasterly to Alaska, to a terminus at Bering Strait on the Pacific.

With a powerful and efficient system of train ferriage across the strait—a distance of say fifty miles—the United States system of railroads would be placed in touch, not merely with that of Siberia itself, but with the whole Asiatic and European system.

Regarding Siberia, it is certain that that country has vast mining and agricultural possibilities, which only need transportation facilities to develop them. In the manufacture of implements and plant for agriculture and mining, the United States are particularly successful. Such a railroad to Alaska, while developing our own territory, would undoubtedly foster a large trade with Asia. China, to the south, must ultimately establish a railroad system; and, when she does, it will merely be a matter of time before she touches the Siberian road to the north and the Indian roads to the south. With an Alaskan road built, every such extension in Asia will lay a new country open to our trade. Freight could then be shipped from New York or New Orleans to Canton, Irkutsk, St. Petersburg, or Paris without breaking bulk.

A railroad to and through Alaska would present engineering difficulties, it is true; but probably no greater than the eleven thousand foot pass on the Rio Grande Railroad, or the famous pass through the Andes of South America.

It is interesting to note that such a scheme, if completed, would make the circuit of the globe a matter of not more than one month's traveling. Allowing five days from New York to the coast, six days to Bering Straits, fourteen days from Bering Straits to London, and six days from London to New York, it would only consume thirty-one days of twenty-four hours to perform the feat which, only a few years ago, in a daring flight of his imagination, M. Jules Verne suggested might be done in eighty days.

Thus it is that in the arts and sciences the marvels of yesterday become the commonplaces of to-day!

THE GREAT AVALANCHE OF THE ALTELS GLACIER.

When we speak of the magnitude of the pent-up forces of Nature, the mind can only have a vague sense of the meaning of the words. Occasionally, as in the awful cataclysm that happened some years ago among the islands of the Indian Ocean, or as in the case of this recent fall in the Alps of a whole glacier through some thousands of feet into the valley below, we get a concrete example of what ruin these forces of Nature can work, when once they lose their equilibrium and are violently set in motion.

We publish in this week's issue of the SUPPLEMENT a very interesting contribution to the London Engineering, from the pen of Mr. C. S. Du Riche Preller, describing in detail the fall of the Altels glacier. He analyzes the momentum set up by this immense body of ice as it swept down through a vertical height of nearly a mile upon the doomed valley of the Spitalmatte below. An approximate idea of the magnitude of the forces at work may be formed by considering that this mass of ice, whose bulk was equal to one and a half times that of the great pyramid of Egypt, swept down a mountain side through a vertical height equal to ten times the height of the pyramid, and in so doing acquired a momentum that carried it up some 1,200 feet to the crest of the opposite mountain, before it finally fell back to a state of rest in the valley below.

LONG-DISTANCE TRANSMISSION OF WATER POWER.

The history of human progress in the mechanical arts is the history of a great struggle between the forces of Nature, active or dormant, on the one hand, and the intelligence of man on the other. No sooner does the mind perceive the magnitude and utility of these forces than it begins to seek out a way to control them. Every new invention marks a further mastery of matter by mind, a more complete subjection of Nature's forces to man's service. Among the many natural storehouses of power that have been drawn upon, perhaps the most available and earliest used was that contained in the rivers and waterfalls. Here was a seemingly boundless supply; and men were quick to avail themselves of it. A glance at the map shows that very often the location of a city has been determined by the presence of available water power. A notable instance of this is the city of Minneapolis, with its world-renowned water-driven flour mills.

But though it is true that, where circumstances permitted it, cities have been built up around a natural source of power supply, it frequently, and more often than not, happens that the particular spot where the fall of water is located, or where the topography of the country favors the impounding of the waters, is ill adapted for the building of a city and the location of factories. In such cases the forces of Nature have been left to run to waste; not because their value was not appreciated, but simply because men knew of no means by which they could utilize them from a distance.

Electricity, the annihilator of space, has solved the problem of transmission; and the water turbine has solved the question of conversion of the stored-up energy of all our streams and rivers. The matter has passed the experimental stage; and there are cities in the United States to-day where the people are transported, lighted, and their factories driven by water power that is located at a distance of many miles, perhaps amid hills or mountains difficult of access.

It is difficult adequately to estimate the benefit that will accrue to this country from the utilization in this way of its vast natural supplies of water power.

Not to mention Niagara, whose possibilities are shown in the successful plant now in operation, it is asserted by experts that Great Falls, Montana, has 268,000 horse power within reach. The Snake River, in Idaho, has three great falls, the American Falls of 50 feet, the Twin Falls of 90 feet, and the celebrated Shoshone Falls of 310 feet. The Grand River in Colorado has been estimated as affording 200,000 horse power. The Colorado River, formed by the junction of the Grand and Green Rivers, flows in great volume and very swiftly for hundreds of miles. By impounding the waters of such rivers as these a power supply could be obtained that would cover all the possible needs of those countries through which they flow.

The States that lie to the west of the Rocky Mountains, and furthest from the sources of coal supply, have been, as was to be expected, the first to avail themselves of the electrical transmission of water power.

Among the earliest instances of this transmission is