

greater cheapness and abundance would be secured in the future. The very advantages that England would still obtain in the exportation of such classes of goods in which she has had the supremacy is lost to her now by "hostile tariffs," and treaties which once secured her valuable international advantages in national trade, are allowed to expire without any prospect of renewal. It is not then to be wondered at that English manufacturers have so much anxiety for the future, and that a growing feeling of discontent is felt against free trade, and that protection is now sought for by many to guard themselves from being undersold by those very countries from which they once drew their wealth—who now in return compete successfully with them in their own markets, and draw wealth from coffers into which they at one time poured millions. The machinery of Great Britain is equal to the requirements of half the world; and that of the United States could, if fully employed, supply the other half; therefore it evidently seems conclusive that, without an enormous and continuous export movement, only a small part of England's machinery and labour can be profitably employed, and when that comes to pass, poverty and ruin must come to her, or to any other commercial nation whose main source of wealth depends upon her manufactures and not upon her agricultural productions. If other nations have derived benefit from protecting their industries, they are of a kind that will not lightly be surrendered, because the protection of those industries benefits most directly the working classes. There has evidently been too great an indifference or security felt by British manufacturers to the rapid progress of other nations to perfection in those very matters in which they held the supremacy. It is possible that, although tardily awakening to the fact, and alarmed at the war of competition being carried into her own country, she will throw aside her conservative notions and more energetically exert herself hereafter, so as to still be able to undersell other countries in certain classes of goods. With her vast accumulated wealth, trained skill and long experience, backed by the enterprise of her merchants and manufacturers, and, also, the readiness of her government to promote the interests of British commerce, Great Britain may long remain a great commercial manufacturing nation, and probably she will, for many years, find new fields from which she can reap future wealth.

The United States may well take a lesson in time from the present depression in business, that, to a very great extent, has been brought about by the rapid improvements made in machinery, which has enabled her to manufacture much in advance of the requirements of the nation.

GEOGRAPHY.

THE NORTH-EAST PASSAGE SUCCESSFULLY ACCOMPLISHED.—At the time when the anxiety of his friends and of the scientific world at large had culminated in the equipment of a special expedition for his succor, and when even the more sanguine confessed their apprehension lest the history of the unfortunate enterprise of Sir John Franklin had been repeated in his case, the happy announcement is made that the "Vega," with Prof. Nordenskjöld and his crew, had reached Behring Strait in safety, having accomplished the memorable task of passing, by way of the Arctic Sea, from the Atlantic to the Pacific. After recruiting the energies of his men, Nordenskjöld proposes to return to Europe by way of the China Sea and Indian Ocean and the Suez Canal.

The voyage just accomplished is the third of Nordenskjöld's Arctic enterprises. Having in the two earlier voyages demon-

strated the practicability of navigating the Sea of Kara, and of establishing, by this new highway, a profitable maritime commerce with Eastern Siberia, Nordenskjöld boldly affirmed the possibility, at certain seasons, of reaching the Behring Strait and Japan and China by the Arctic Sea. To test this practicability, the present expedition, on a larger scale than any of its predecessors, was fitted out and sailed from Gothenburg on the 4th of July, 1878, on the ambitious enterprise which has just been crowned with success. We have already recorded that the "Vega" (Nordenskjöld's ship) and the "Lena" (her companion vessel) sailed in safety through the Kara Sea, reached the mouth of the Yenesei, in North-western Siberia, on the 6th of August; and that, sailing thence on the 9th of the same month, they doubled the North Cape of Asia on the 19th, and on the 27th reached the mouth of the Lena, where the "Vega," parting company with her consort (which proceeded up the river), set out alone to accomplish the last and most hazardous task of reaching the straits. Of what transpired after the "Vega" left the mouth of the Lena, the details are yet unknown. It appears to be probable, however, that she was caught in the ice and detained for months near Kellett Land, where she safely rode out the Arctic winter, and at length, as is now reported, happily reached the goal of her intrepid commander's ambition.

HOT MINES.—Probably the hottest mines in the world are those situated on the Comstock lode in Nevada. The highest mine temperature reported to the British Coal Committee was 106 deg. Fahrenheit, but some of the Cornish mines have shown an air temperature rising to 113 deg. Fahrenheit. The hottest water reported in a Welsh mine was at 125 deg. Fahrenheit (J. A. Phillips). In the Comstock mines, according to Professor Church, who has lately described the conditions, the air is never hotter than the rock, as it is in Cornish mines, and the rock in the lower levels (1,900 ft. to 2,000 ft.) appears to have a pretty uniform temperature of 130 deg. Fahrenheit. The readings were obtained by placing a thermometer in ordinary drill-holes, 10 in. to 3 ft. in dept, immediately these were finished, and keeping them there 10 minutes to half an hour. The mining in the Comstock proceeds with remarkable rapidity, the drifts being advanced 3 ft., 5 ft., and sometimes even 8 ft. or 10 ft. a day, so that there could not be any sensible diminution of heat at the bottom of a drill-hole. The temperature of the air is subject to more fluctuations than that of the rock, for the simple reason that it is artificially supplied to the mine. In freshly-opened ground it varied from 108 deg. to 116 deg. Fahrenheit; but higher temperatures are reported at various points (reaching 123 deg. Fahrenheit in one case). The water reaches much higher temperatures, 150 deg. Fahrenheit and upwards. One small stream that has flowed 150 ft. over the bottom of a closed drift with little evaporation gave 157 deg. Fahrenheit. Belts of excessively hot ground are often met with in these mines, and also, though fewer in number, belts of unusually cold rock.

THE LARGEST LOCOMOTIVE.—Uncle Dick, says an American paper, weighs 65 tons, and he is 60 ft. long from his head-light to the rear end of his tender. He is the biggest locomotive in the world, and has been turned out of the Baldwin Locomotive Works for duty on the precipitous inclines of Atchison, Topeka and Santa Fe Railroad. A boiler 21 ft. long supplies steam for cylinders 20 in. by 26 in., and gives motion to eight 42 in. drivers, while a large tank surmounting the entire structure not only carries a water supply, but helps to give Uncle Dick a tighter grip on the rails. His driver will have control over three independent systems of air-brakes, and can bring to bear at once upon his wheels a restraining force of 75 tons, which is none too large, inasmuch as a "shoe pressure" of 50,000 lb. is required to keep him, when standing still and alone, on the steep road over the Ruton Pass from surrendering to gravitation and rushing down hill by his own weight. How heavy these grades are can be understood when it is noted that one end of Uncle Dick will often stand more than 3 ft. higher than the other, so that in travelling his own length will do the work of lifting about 250 tons a perpendicular foot. And yet this monster, rejoicing in his strength, will rush up the flank of the Rocky Mountains with ten loaded cars behind him.

PROPERTIES OF GLYCERINE.—Glycerine should not be rubbed on the skin in an undiluted state. One of its remarkable properties is its power to absorb moisture, and hence its irritating effect on the skin. About three fluid ounces of water to one of glycerine will form a mixture which will neither attract moisture nor evaporate, the weight scarcely varying from week to week, either in one direction or the other. The mixture should be kept in a cool, moist place, and used as required.