

of manuals, and translated into English in 1887 by Dr. Davidson.

—Three years ago our readers' attention was directed to the then recently concluded barometric observations of Prof. A. Heilprin among the giant volcanoes of Mexico, made with a view to redetermining the elevations of the four principal summits of the Republic, the Nevado de Toluca, Ixtaccihuatl, Popocatepetl, and Citlaltepētāl (or Peak of Orizaba, as it is commonly called). The results obtained showed, contrary to common supposition, that the Peak of Orizaba (18,205 feet) exceeded Popocatepetl in elevation by nearly seven hundred feet, and that it was justly entitled to the first position among the Mexican mountains, if not among all the summits of the North American Continent. Much incredulity was at the time expressed regarding this determination of altitude, and it even appears that considerable feeling was aroused by it in the City of Mexico, so justly proud of the "smoky mountain," one of the "watch towers" of the Valley of Anahuac, are the inhabitants of the Mexican capital. More recent determinations of the two rival summits, made by J. T. Scovell of Terre Haute, Ind., in charge of a special commission of exploration, confirm Prof. Heilprin's measurements, and place them within an unusually narrow margin of error. The average of the barometric determinations of the Peak of Orizaba gives 18,179 feet, and of the triangulation, 18,314 feet—a mean of 18,246 feet. Assuming this altitude to be approximately correct (and it is, so conceded by the editor of the Royal Geographical Society's Proceedings), the question as to the culminating point of the North American Continent resolves itself into a consideration of the claims of Orizaba and Mount St. Elias. The latter mountain, which the earlier determinations of Russell and Kerr had almost consigned to the level of the higher peaks of Colorado and California, has since been reconstituted by Russell into a mountain of the first order, with an elevation of approximately 18,100 feet. As such it confirms the position stated in the *Nation*, that while a close rival of the Mexican peak, its place is probably after, rather than before, that mountain.

—In his forty-seventh annual report, Prof. Pickering, Director of the Harvard College Observatory, makes fitting allusion to the death of a second member of the famous firm of Alvan Clark & Sons, Mr. George B. Clark, to whose genius for mechanical devices, indomitable perseverance, and devotion to the interests of the Observatory, the success of many of the most useful of the Harvard instruments is due. While, as noted in previous years, the work with the equatorials and the meridian instruments, circle and photometer, is systematically prosecuted, the research of the Henry Draper Memorial continues to absorb very largely the interests of the Observatory. Two eight-inch telescopes are constantly photographing the sky, about 2,800 plates having been taken with the Draper telescope at home, and nearly 2,000 with the Bache telescope of like pattern in Peru. A fruitful research with these plates has been the repeated discovery of variable stars, which are readily distinguished by having the hydrogen lines bright in their spectra. The valuable material continually accumulating with these instruments has frequently proved useful in studying the history of newly discovered objects, conspicuously so in the case of Nova Aurigæ, which was found to have been photographed more than twenty times antecedently to its discovery. The last

plates of this now familiar object show its spectrum resembling that of a planetary nebula. With the eleven-inch Draper spectrograph nearly a thousand photographs were taken, about one-third of them being spectra of β Aurigæ, from which will be determined the law of that remarkable periodic doubling of the lines which is regarded as indicating actual duplicity of the star itself. In the lunar eclipse rather more than a year ago, attempt was made, both at Cambridge and in Peru, to photograph a possible satellite of the moon, but with only a further accumulation of negative evidence of the existence of such a body.

—By the establishment of the fund bearing his name, the wish of Mr. Boyden, who desired to secure an astronomical station where atmospheric hindrances would be greatly diminished, has been eminently fulfilled in the Harvard station at Arequipa, Peru. A quivering atmosphere is no longer, as heretofore, the chief obstacle to the progress of observations of the first order, and a limit would now seem to be enforced rather by the size of available telescopes. At 8,000 feet elevation, Prof. W. H. Pickering has employed a thirteen-inch telescope in a critical scrutiny of the planet Mars at its recent near approach to the earth, determining exact positions of nearly a hundred points on its surface, discovering forty minute black points (provisionally designated lakes), and measuring the oblateness of our neighboring planet, which, it is found, may possibly have an excess of equatorial cloud. Also, the reality of the so-called canals of Schiaparelli has been confirmed, various measurements of them secured, and the relative colors of different portions of the planetary disk made the matter of minute record. Nor have Mercury and Venus been neglected, the behavior of the markings on the surface of the former confirming Schiaparelli's view that axial rotation and orbital revolution of this planet are accomplished in the same time, while on Venus no permanent markings whatever were detectable. The Magellanic clouds, too, have come in for their share of attention, the result having been reached that their light is due partly to stars and in part to nebulous matter. Meteorology also is regularly attended to, with observations not only at Arequipa, but at the Chachani Ravine, elevation 16,650 feet, as yet the loftiest meteorological observatory in the world. Little space is left for mention of the Bruce photographic telescope, of twenty-four inches diameter, now about to be brought into operation at Cambridge, and which, if successful, will be in many respects the most powerful telescope in the world. After a period of use upon the northern sky, it will be sent to the Boyden station in Peru for a few years' study of the southern heavens, upon which only a very few telescopes of great capacity have yet been turned.

—Russian agriculture is the subject of a report recently issued by the British Foreign Office. From this it appears that in European Russia, as a whole, the spring crops of 1892 were again considerably below the average, while in three of the sixteen so-called "famine governments" the harvest hardly repaid the cost of ingathering; in ten more it was deficient in quality and in quantity; and in only three was it fairly abundant. The autumn harvest, on account of a long drought in April and May, the scorching winds of August and September, and an incursion of locusts, was believed to be still worse. In five provinces (Saratov, Riazan, Tula, Kursk, and Voronezh)

the yield of the whole year has not been sufficient to feed their 10,000,000 inhabitants, and by this time, unless they have been relieved from other districts, they are reduced to starvation rations. But their ability to meet this scarcity is less than it was a year ago. Then they had cattle and a little money laid up. Now their cattle have been sold or eaten and their money has been spent. In some districts one may wander by the hour without seeing a horse or a cow. In the Government of Saratov, for instance, there were in May, 1891, 2,000,000 head of cattle; to-day there are probably not 100,000, while, in addition, the debts of the peasantry of the sixteen famine governments for unpaid taxes and borrowed money amount to more than \$100,000,000. The direct cause of last year's failure in these provinces appears to have been the fact that the seed sent by the Government was poor in quality and deficient in quantity, and was not distributed until some three weeks after the time for sowing. The gradual deterioration of agriculture in this region—the famous black-soil country, the most fertile in Europe—is attributed in the report to three principal causes. The ruthless destruction of the great encircling forests, by which the moisture has been diminished and the protection from the scorching winds has been taken away, has changed the climate. The Mir system of land-tenure, by which the arable land is divided by lot every three years, tends to exhaust the soil, the temporary cultivator naturally desiring to get all he can from his land and being unwilling to enrich it for the benefit of his successor. The third cause is the oppressive taxation and the time of collecting the taxes, immediately at the close of harvest and before the crops are sold. From all these causes combined, and taking into consideration the ignorance of the Russian peasant and his tendency to fatalism, there is great reason to fear that the famine conditions are becoming chronic.

MAHAN'S SEA-POWER.—II.

The Influence of Sea-Power upon the French Revolution and Empire. 1793-1812. By Capt. A. T. Mahan, U.S.N. 2 vols. Boston: Little, Brown & Co.

CAPT. MAHAN'S second volume treats of the civil and administrative, as well as naval, warfare against commerce during the Napoleonic wars, and discusses in a critical and appreciative manner the career and Ministry of the younger Pitt. The struggle for existence between France (or rather Napoleon) and Great Britain, represented mainly by the two personalities of Pitt and the Emperor, enters into almost every page, and the strength of the sea-power of Great Britain is as clearly shown upon its commercial side as it is in the more familiar and vivid aspects in which the forces of war were employed. At the end of 1799, when Napoleon assumed the First Consulate and made overtures for peace to Great Britain which received an impossible answer, the power and prosperity of that country, notwithstanding the immense burdens of the war, had greatly increased. Her insular position and control of the sea gave her peace at home, while from the maritime and commercial paralysis of France and Holland, her great rivals, she had now become both the warehouse and factory of Europe. The foreign trade, which in the last year of peace had amounted to £44,500,000, in 1800 exceeded £73,000,000 in value, and thus Pitt was able so to

increase the revenue that the receipts above the great war taxes far exceeded anything known before. At this time, although Napoleon was almost supreme upon the Continent, his dominion upon the sea was limited to the range of his guns from shore, and, notwithstanding the abundance of French corsairs and attempts upon English commerce, the carrying trade was under the control of England, and not a single merchant-vessel was upon the sea carrying the French flag.

The armed neutrality of 1800 and the peace of Lun'ville left Great Britain alone in 1801 in her war against France, who was aided for the moment directly or indirectly by the rest of Europe. The Baltic expedition, aimed against the Northern Powers, with Nelson as the fighting spirit, sailed in March to attack the Russian and Danish fleets. The latter, under the protection of the guns of Copenhagen, was committed to a stationary defence, and Nelson proposed to his superior to go direct to Revel and attack the Russian fleet and destroy it, suggesting, also, the alternative of a detachment of ten ships for that purpose and "with the remainder attempt the business at Copenhagen." Nelson's bold suggestion receives the strongest commendation from the author as a blow at the soul of the Confederation, or, as Nelson terms it, "a hewing of the trunk" which would carry the limbs in its fall. The author fails, however, to condemn, as we think he should, the alternative which would expose the English fleet to a defeat in detail, as the remainder left for the Danes would not have been sufficient to provide for the contingencies that might and did arise before Copenhagen. The battle of Copenhagen was never a popular one in England, and neither his country nor history has given Nelson credit for the courage, skill, and endurance displayed upon this occasion. Fighting from fixed defences, the courage and endurance of the Danes were most marked. Jurien de la Gravière, the first of French naval critics, says of the fight and Nelson's merits upon this occasion, that "they will always be, in the eyes of seamen, his fairest title to glory. He alone was capable of displaying such boldness and perseverance, he alone could confront the immense difficulties of that enterprise and overcome them."

Events in this notable year followed each other rapidly: the Russian fleet escaped from Revel, the armed neutrality was dissolved, Bonaparte's attempts to relieve Malta and Egypt failed, and, finally, his endeavors to collect a fleet of the allied forces at Cadiz upon the flank of the English communications with the Mediterranean resulted in the battle of Algesiras, with its varied fortunes but ultimately disastrous results for the allies. The advantages of the interior position were well exemplified here, and the strategic superiority of the fleet or squadron that closely masks an enemy's port. Soon after, peace was declared, leaving Great Britain with a naval force of 202 ships of the line, as against 135 with which she had commenced the war, while France, beginning with 80 ships, found herself with but 30 at the end.

In 1803 war again began, Cornwallis sailing the day after the declaration with ten ships to resume the watch off the great French port of Brest, while a day later Nelson hoisted his flag on board of the *Victory* on his way to assume the chief command in the Mediterranean. Pitt foresaw the methods by which Napoleon sought to subdue England—one by attempted invasion, the other by the destruction of her trade and consequent undermining of her financial stability. After the occupation of Hanover and the reoccupation of the lower part of the Italian

peninsula, Napoleon turned his attention towards the invasion of Great Britain. The construction of the flotilla which, covered by the fleet, was to be the means of transport across the Channel, operated against the construction of the new vessels for the navy also desired by Napoleon. Not only did it absorb the scanty material on hand for ship-building, but the work of construction and constant repairs drained the dockyards of mechanics. Much doubt has been expressed of late years as to the sincerity of Napoleon's intentions to attempt the crossing of the Channel, but the author holds, with such careful historians as Thiers and Lanfrey, that it is not possible, after examining the voluminous correspondence of Napoleon during the thirty months of preparation, to avoid the conviction that so elaborate a deception as it would involve would be impossible even for the Italian nature of Bonaparte. The boldness of the undertaking and the rapid movement against Austria from Boulogne afterwards caused these doubts and strengthen Metternich's report of Napoleon's own declarations; but Boulogne, although admirably situated to disguise the movement against Austria, was not less so with respect to an invasion of England. Besides, it was, as Jomini testifies, customary for Napoleon to entertain an alternative project in case his combinations failed, as this did, when Villeneuve sailed for Cadiz instead of for Brest. The campaign of Trafalgar, in which Napoleon attempted the union of the naval strength of France and her ally, Spain, at or near Brest, followed, ending with Nelson's victory and death. The author thus vividly pictures the period of waiting preceding this victory:

"Meanwhile, that period of waiting from May, 1803, to August, 1805, when the tangled net of naval and military movements began to unravel, was a striking and wonderful pause in the world's history. On the heights above Boulogne and along the narrow strip of beach from Etaples to Wimereux, were encamped 130,000 of the most brilliant soldiery of all time. . . . Growing daily more vigorous in the bracing sea air and the hardy life laid out for them, they could on fine days, as they practised the varied manœuvres which were to perfect the vast host in embarking and disembarking with order and rapidity, see the white cliffs fringing the only country that to the last defied their arms. Far away, Cornwallis off Brest, Collingwood off Rochefort, Pellew off Ferrol, were battling the wild gales of the Bay of Biscay, in that tremendous and sustained vigilance which reached its utmost tension in the years preceding Trafalgar, concerning which Collingwood wrote that admirals need to be made of iron, but which was forced upon them by the unquestionable and imminent danger of the country. Farther distant still, severed apparently from all connection with the busy scene at Boulogne, Nelson before Toulon was wearing away the last two years of his glorious but suffering life, fighting the fierce northwesterners of the Gulf of Lyons, and questioning, questioning continually, with feverish anxiety, whether Napoleon's object was Egypt again or Great Britain really.

"They were dull, weary, eventless months, those months of watching and waiting of the big ships before the French arsenals. Purposeless they surely seemed to many; but they saved England. The world has never seen a more impressive demonstration of the influence of sea-power upon its history. Those far-distant, storm-beaten ships, upon which the Grand Army never looked, stood between it and the dominion of the world. Holding the interior positions they did, before—and therefore between—the chief dockyards and detachments of the French Navy, the latter could unite only by a concurrence of successful evasions, of which the failure of any one nullified the result. Linked together as the various British fleets were by chains of smaller vessels, chance alone could secure Bonaparte's great combination, which depended upon the covert concentration of several detachments upon a point practically within the enemy's lines. Thus,

while bodily present before Brest, Rochefort, and Toulon, strategically the British squadrons lay in the Straits of Dover, barring the way against the army of invasion."

With Trafalgar all attempts of the French to wage purely naval war against Great Britain ceased. The contest continued by Napoleon took the form of war against her commerce, carried on with a vigor almost savage, and with little heed, as we well know, to the rights and interests of weaker and neutral nations. The French made use of privateers and scattered cruisers, directed against both English shipping and neutral vessels with English goods. The rôle of the English in these times was one principally of commerce protection, in ways likely to be employed again under similar circumstances. It consisted in the assemblage of convoys, sometimes numbering a thousand vessels, under man-of-war protection, of patrol by vessels having defined cruising grounds along the commercial routes, and by the capture of the foreign colonial possessions of France and her allies in the West-Indies and elsewhere that served as bases for predatory warfare.

The net results of Napoleon's policy were trifling. By various and mutually confirmatory modes of investigation, Capt. Mahan finds that the loss inflicted did not exceed two and a half per centum of the total value of British trade. This loss, as he well says, practically reduced itself to nothing more than a war tax, onerous, but, under the circumstances, far from being insupportable. The strain of the Napoleonic decrees upon the Continent, then virtually under the control of the great Emperor, was finally too great to be endured; the privations of all classes, the misery of the poor, made the Continental States ready for rebellion when the opportunity came. It came for Spain in 1808, for Russia in 1810, and the peninsular position of Spain and Portugal gave to England's sea-power another opportunity for direct warfare against the forces of the Empire, while the Czar's action led to the invasion of Russia. Napoleon, whose military career had emphasized the overwhelming effect of concentration, was obliged to divide his forces and separate them by the length of Europe. The retreat from Russia began the end of his empire.

WHITNEY'S LINCOLN.

Life on the Circuit with Lincoln; with sketches of Generals Grant, Sherman, and McClellan, Judge Davis, Leonard Swett, and other contemporaries. By Henry C. Whitney. Illustrated. Boston: Estes & Lauriat.

THIS is the bulkiest addition to our Lincoln literature that we have had since the voluminous biographical history of Nicolay and Hay, and in its general make it is coarser-grained than anything its subject has so far inspired, except the biography by W. H. Lamon. Its coarseness, however, is literary in the main, and not moral, like Lamon's, whose brutal frankness took a ghoulish pleasure in unearthing everything sordid in the circumstances of Lincoln's life and everything questionable in the methods of his political career. The hard and cruel facts of his narration nearly all remain in Herndon's *Life*, but so different is Herndon's temper, and so much warmer his appreciation of Lincoln's better parts, that the final impression left upon our minds is very different. Maj. Whitney's book, while reproducing, in less orderly arrangement and with much less of detail, the materials of Herndon's and Lamon's, is marred by an extravagance of laudation