

SCIENTIFIC AMERICAN

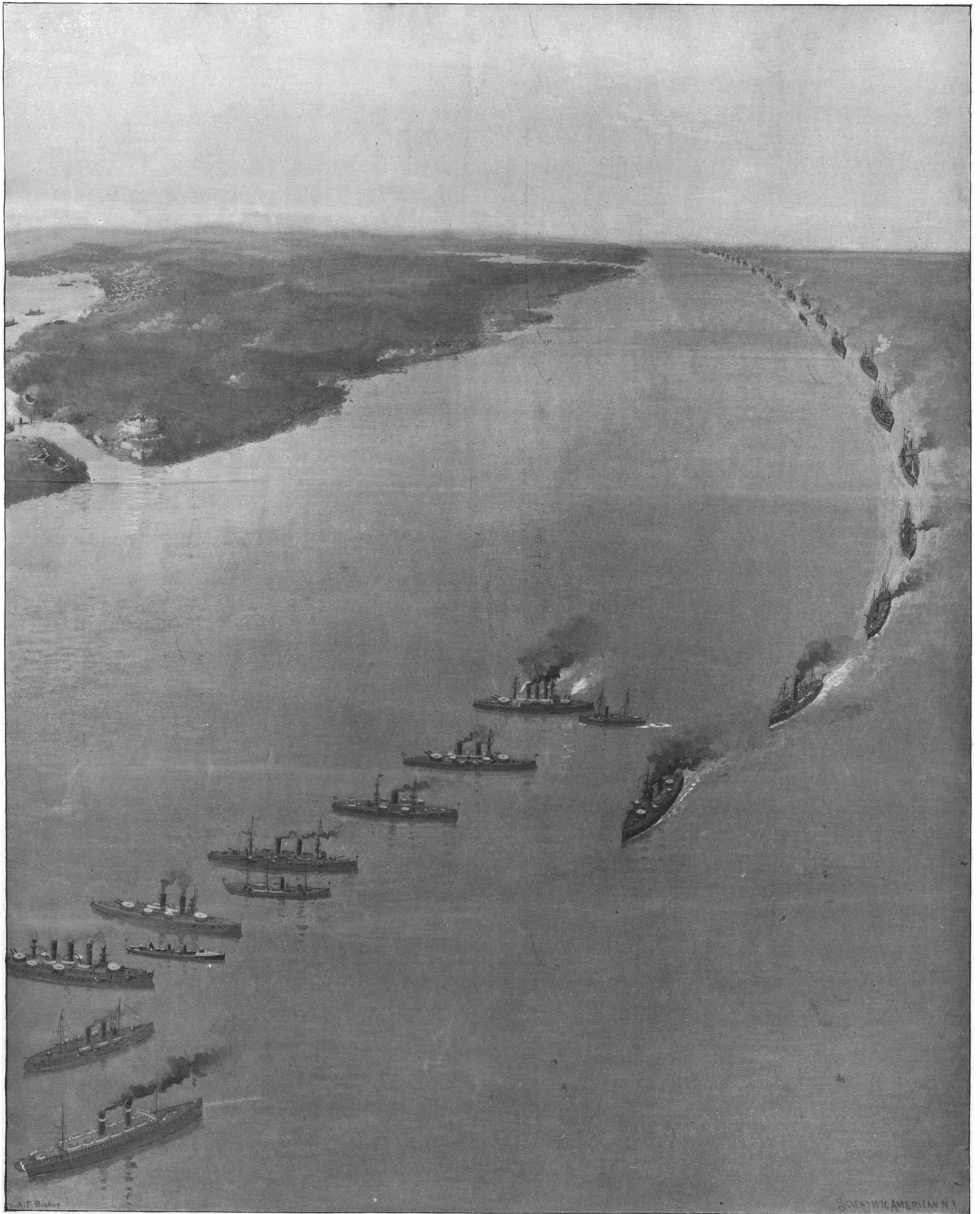
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A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS CHEMISTRY, AND MANUFACTURES.

Vol. LXXIX.—No. 1.
ESTABLISHED 1845.

NEW YORK, JULY 2, 1898.

[\$3.00 A YEAR.
WEEKLY.]



ARRIVAL OF GEN. SHAFTER AND THE UNITED STATES ARMY AT SANTIAGO, JUNE 19.—[See page 8.]

THE CUBAN INVASION.

On Tuesday, June 14th, approximately 16,000 men, representing all branches of the land service, were embarked at Tampa on 35 transports, and these with two water boats set sail in convoy guarded by the "Indiana," "Helena," "Castine," "Bancroft," "Morrell" and "Hornet," a force that was further strengthened off Rebecca Shoals Light by the "Detroit," "Manning," "Osceola" and "Wasp," and off the coast of Puerto Principe by the "Montgomery" and "Porter"—an array of war vessels more than sufficient to cope with the entire force now available to Spain in West India waters.

The impression generally was that the fleet and transports would pass around Cape San Antonio, at the western end of Cuba, a supposition doubtless encouraged by the government for its own purposes. Instead, the voyage was made eastward via the old Bahama Channel, rounding Cape Maysi, which consumed six days—Sampson's blockading squadron was first sighted on Sunday, the 19th. A few men were seized with typhoid fever and measles, doubtless contracted at Tampa; a few mules and horses, confined to the holds, succumbed to heat; and from the time of leaving Egmont Key, at the entrance of Tampa Bay, only a single ship, aside from U. S. men-of-war, was encountered, and this a freighter from Jamaica. Fortunately, even the elements were propitious, pleasant weather being the rule, and only a few suffered from seasickness. Taking all in all, the expedition has been remarkable, first for the utter lack of unpleasant or untoward happenings, and second as being the largest of its kind sent out by any nation since the Crimean war.

On Tuesday the disembarkation of the troops began and was practically completed the following day. Surgadero de Baquiri, seventeen miles east of Santiago, was selected for the initial operations of the army, after due conference with the Cuban leaders in the province and the admiral on station commanding. The advantages of this locality are a wooded plateau of considerable breadth extending along the coast westward without material interruption to Aguadores, and continued again beyond the latter point to the east shores of Santiago Bay; two highways, one along the coast, the other inland, the latter affording superior opportunities, as far as Cuban roads can, for the transportation of light artillery and supply trains; finally, the region provides an abundance of good water, which is a matter of no little moment.

If the inland road is selected, it will be necessary for the troops to either ford or bridge three streams, viz., the Senilla, Guama and San Juan, neither of which, fortunately, is more than a few yards wide; and though at this season all are in "spate," they are seldom more than breast deep at the fording places. As the banks are high, the construction of suitable bridges should entail no great difficulties. The greatest drawback to the march on Santiago, apparently, will be the forwarding of heavy artillery, for not alone is the highway unsuitable to the transportation of such loads, but it is commanded by hills and ridges all the way, and bordered on both sides with heavy brush and jungle, affording excellent opportunities for harassing guerrilla operations on the part of the foe.

It is apparent, therefore, even under the most favorable conditions, the speedy fall of Santiago can hardly be looked for. A well equipped Spanish army of not less than 30,000 men is admittedly encamped in and about the city, and many believe this estimate entirely inadequate.—A gentleman recently arrived from Havana by H. M. S. "Talbot" assures the SCIENTIFIC AMERICAN that the total is not less than 45,000, and perhaps exceeds 50,000. The city itself, aside from its harbor defenses and Cervera's fleet, is well guarded by lines of entrenchments that have been pushed beyond the boundaries and atop of the hills, at every available point and equipped with the latest types of modern ordnance; there are newly erected batteries at the villages of Altares, Juragura and Sevilla; and finally the fortifications at Aguadores are to be reckoned with, and perhaps still more recent defenses than the foregoing, manned and equipped by men and guns from the Spanish fleet. All in all, the ground about Santiago is ideal in the opportunities afforded for defense, and doubtless every foot thereof will be stubbornly contested.

Although it is claimed there are two well armed and equipped bodies of insurgents, numbering respectively 3,000 and 5,000, encamped to the eastward of Aguadores, and another body near Asseradero of 930, all anxious to co-operate with the United States troops, it is probable these figures are somewhat exaggerated; but if true, and counting the marines and sailors that may be spared from Admiral Sampson's fleet, the total forces available to General Shafter do not exceed 26,000 combatants. It is, therefore, a source of satisfaction that three brigades have already been forwarded from Newport News by the Washington authorities, and that it is also proposed to send further reinforcements at an early date. While the press is inclined to underrate the strength of the foe, there are no reasons for believing that the military officers in command are misled, but

that they fully appreciate the magnitude of an undertaking like the invasion of Cuba.

A Geographical Commemoration.

The year 1898 will long be noted for the commemoration of three great explorers, the Portuguese Vasco da Gama, the Italian Vespucci and the Russian Deschnev, and a few notes concerning them, giving the results of recent investigations, will, perhaps, be interesting.

It was Bartolomeu Dias who first doubled the Cape of Good Hope, but it was Vasco da Gama who first made use of the knowledge then gained to sail from Portugal around Africa to India, just 400 years ago. The King of Portugal desired to conquer India, and though his council was opposed to it, he set about making preparations for the conquest. Four ships were fitted out under the superintendence of Dias, and the commander-in-chief was Vasco da Gama, who directed the fleet from his flagship "San Gabriel." They sailed July, 1497, and the first landing was made at St. Helena, and the Cape of Good Hope was passed without difficulty. On Christmas Day a coast was seen, and for that reason the place was called "Natal," the name which it still bears. He made other landings on January 6 and 22. He reached Melinda on April 15, and on April 24 he started for India under the guidance of an Indian pilot, whom Gama had procured from the ruler of Melinda through fraud and violence—methods which were not unknown in the Iberian peninsula even in those days. On May 20, 1498, Gama anchored in Calicut on the western coast of the Indian peninsula. He stayed in India until the 5th of October and then sailed westward. The trip back to Africa took three months, and it was not until the 20th of March that the Cape of Good Hope was rounded again, and it was not until the end of August or beginning of September, 1499, that what remained of the expedition again anchored in the harbor of Lisbon. The career of this explorer was tarnished by a series of outrages which completely undermined the dominion which the Portuguese founded in India. "Nevertheless, in its relation to the world at large," says Natural Science, "the achievement was one scarcely inferior to the slightly prior discovery of the new world. It forms an absolute turning point in commercial, economic and political history of Africa and Asia." The four hundredth anniversary of the voyage was celebrated at Lisbon, May 7th to the 20th, an exhibition being held there. The voyage itself did not effect any extension of our knowledge of the geography of India other than a more exact determination of the distance between Africa and India, but the enthusiasm with which his achievement was hailed in Portugal was for a long time of immense influence on the development of commerce and navigation. Not only single vessels, but whole fleets were manned and sent to India by the route that Gama had opened. As a result, the wave of Portuguese exploration and geographic discovery passed rapidly through the Indian Ocean to Ceylon, the Sunda Islands and Malacca; to Socotra and Ormuz, and thence to the interior of the Red Sea and Persian Gulf; from Malacca to the Moluccas, China and Japan. Among the chief conquerors and explorers we may recall the well known names of Tristão da Cunha, Afonso d'Albuquerque, João de Castro and Ferdinand Magellan; and not less immortal is the name of Camoens, who sang the story of his country's deeds while banished to the distant gardens of Macao.

The third congress of the Italian Geographical Association was held at Florence during the week beginning April 12. The proceedings of the congress included the celebration of the four hundredth anniversary of the discoveries of Toscanelli and Vespucci. As to the forename "Amerigo" of the latter, there has been much dispute, and there have not been wanting geographers to take opposite views and say that this name was really "Alberico," and that he changed it himself or it was changed by his friends to "Amerigo," in order to make it resemble more closely "Amerrique," which is said to have been the aboriginal name of the tribe of Indians living in Nicaragua discovered by Columbus. Fortunately the explorer's register of baptism has recently been discovered at the church of San Giovanni, at Florence, and is given in full in the SCIENTIFIC AMERICAN for March 19, 1898. Vespucci's claim to be the discoverer of America rests chiefly upon his own word, and, unfortunately, contemporary history is silent regarding the alleged voyage, and he was busily engaged at Seville and San Lucar fitting out the fleet at the time when he alleged he made his remarkable voyage. He did go to America with three subsequent expeditions, concerning each of which he wrote a narrative.

It is stated that Martin Waldseemüller, in his "Introduction to Cosmography," 1507, first proposed the name "America" for the western continent, and in 1510, in a manuscript map of Glareanus, we find the legend "Terre America." We have already illustrated in the number cited above the interesting portrait of Amerigo Vespucci recently discovered.

The third notable explorer is Deschnev, the Cossack, who sailed in 1648 from Kolyma, past the northeast point of Asia down to the mouth of the River Anadyr, on the Asiatic shore of the Pacific, thus being, it is

supposed, the first European to sail down the strait afterward named after Bering, and to prove not merely the possibility of a northeast passage, but the more important fact of the separation of Eurasia and America. It is a curious fact that, for many years, the exploit of Deschnev was unknown to the Russian authorities, but now a statue is to be erected to him at Chabarowsk, on the Amur, and the name of East Cape is to be changed to Cape Deschnev, so that the three notable explorers are to be commemorated by the nations to which they belong, for the real or supposed discovery of the route to the East and West Indies and of the northeast passage.

Recent Comets.

BY WILLIAM R. BROOKS, M.A., F.R.A.S.

On June 11, a comet was discovered at the Lick Observatory by means of photography.

Mr. Codrington was exposing a plate for the photographic registration of some celestial objects, when, upon developing the same, a streak of light was found thereon, which indicated the presence of a comet. This was confirmed by visual observation with the telescope.

The comet was observed by the writer on June 14, in right ascension, 16 h. 14 m. 40 s.; declination south, 27 deg. 7 m.

It was in the constellation Scorpio, near the bright red star Antares.

Daily motion, about three-quarters of a degree in a southwesterly direction.

The comet is a moderately bright telescopic object.

My latest observation was on June 17, when its position was, right ascension, 16 h. 4 m. 2 s.; declination south, 29 deg. 1 m. On July 1 its approximate place will be right ascension 15 h. 19 m.; declination south, 36 deg. 10 m.

ENCKE'S COMET.

This well known comet was recently detected at its present return by Tebbutt, in Australia. It has the shortest period of any known comet—three and one-third years. The comet passed perihelion on May 24, and was then in good northern declination, but too near the sun to be seen—setting in bright twilight.

Several attempts were made to detect it at this observatory, but the above conditions were unfavorable. From now on the comet may be well observed in southern latitudes.

WOLF'S PERIODIC COMET.

This comet was detected by Hussey, of the Lick Observatory, on its present return, on June 16, in right ascension 2 h. 16 m.; declination north, 19 deg. 42 m.—very near to the predicted place as indicated by the ephemeris. It is in the eastern morning sky.

The following ephemeris will show its course through the heavens for the next few weeks:

	R. A.	Decl. N.
	h. m.	deg. m.
June 27.....	2 48	+20 9
July 1.....	2 59	20 11
July 9.....	3 23	20 4
July 17.....	3 47	19 41
July 25.....	4 9	19 0
July 29.....	4 21	18 33

On June 14 a faint comet was discovered at Lick Observatory by Perrine, in right ascension 3 h. 29 m.; declination north, 58 deg. 36 m. It is best observed in the northeastern morning sky.

The comet was observed by the writer with the 10-inch refractor of this observatory on June 17, thirteen hours, in right ascension 3 h. 46 m. 30 s.; declination north, 58 deg. 2 m.

Its predicted place on July 2 is, right ascension 5 h. 10 m.; declination north, 52 deg. 27 m.

It is slowly increasing in brightness.

Smith Observatory, Geneva, N. Y., June 20, 1898.

The Current Supplement.

The current SUPPLEMENT, No. 1174, has a number of articles of interest. "The Causes of the Explosive Effect of Modern Small Caliber Bullets" is very timely, in view of the fact that the Spaniards use Mauser rifles and that both our navy and army are also equipped with guns firing small caliber bullets. "The Competition of Automobile Hackney Carriages" illustrates the most modern types of automobile carriages which now ply for hire in Paris. The article shows that in Paris, at least, the horseless carriage industry is on a firm foundation. An important paper by Mr. James W. See on "Patents" deals with modifications, divisional patents, solicitors, contingent fees, infringements, government divisions, copies of patents, digests, foreign patents, etc. "An Apparatus for the Production of Acetylene Gas" describes a number of modern forms of apparatus for producing the new illuminant. "Liquefied Air for Industrial Purposes" describes the devices of M. Pictet and M. Cailletet. "A New Railroad Station in Dresden" describes one of the finest railroad stations in the world. "Don Carlos" gives some particulars of the life of this interesting and picturesque pretender to the throne of Spain. "Indian Hemp" is an article by Dr. G. Archie Stockwell. "The Dussaud Telescope" describes an interesting French invention.