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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are sharp, the articles short, and the facts authentic, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

## THE PROPOSED NAVAL MEMORIAL ARCH.

Although, at the time, it was a matter of regret to the friends of the United States Navy—that is to say, to every right-hearted American—that the memorial arch which was erected at the time of the home-coming of Admiral Dewey was not perpetuated in marble as a lasting tribute to the triumphs of our navy in the late war with Spain, for various reasons it was certain that the appeal for the necessary funds to build a permanent Dewey Arch would meet with a half-hearted response. The committee which had charge of the scheme has done the wise thing in returning the subscriptions and giving the matter a quiet burial.

The failure of the Dewey Arch proposal has left the way clear for the erection by the people of the United States of a memorial, not merely to one hero of one particular naval war, but to all of the men who, from Paul Jones and Perry to Dewey, Sampson, and Schley, have contributed to the glory and renown of the United States Navy; and we are greatly pleased to learn that the project for erecting a fitting memorial monument of the kind, which was undertaken some months ago by the alumni of the Naval Academy, has been advanced so far that it is now certain of accomplishment.

The memorial is to take the form of an arch of such colossal proportions that it will be twice as lofty as the Dewey Arch, and will exceed in height and bulk the famous Arc de Triomphe in Paris, and will, therefore, be the largest structure of the kind in ancient or modern times. It will be enriched with sculpture symbolical and commemorative of the greatest events in the history of the navy, and niches will be provided to receive statues of past and future admirals.

This noble memorial is to be raised on the sea wall of the Battery, New York, and it will be approached through a handsome sea gate and inclosed basin, the basin being flanked by two piers, at the end of each of which will be placed a colossal beacon. The arch will stand in a spacious plaza, which will be ornamented with appropriate statues and naval trophies. The whole structure will be built in white marble, and it is expected that the construction, which is to be commenced this spring, will take three years to complete.

The designs have been accepted by the committee, the Battery site has been approved by the Mayor, the Municipal Art Commission and the Park Commission; a large part of the necessary funds for construction have been promised, and assistance is to be sought from the city, the State and the National government.

This admirable project should command the active support of the citizens, not merely of New York, but of every State of the Union.

## VAST AND INCREASING BULK OF THE MODERN STEAMSHIP.

Great as are the dimensions of the latest transatlantic freight and passenger steamers, there are ships now under construction which will exceed them on every point of comparison. The past decade has seen a similar increase in the dimensions of the motive power and rolling stock used in land transportation; but in that field it is safe to say that the limits imposed by the size of tunnels, the height of bridges, and the width of platforms, will prevent any considerable increase in the future, either of locomotive or cars. Transportation on the high seas, however, has no such limitations to contend with; for whereas to accommodate larger rolling stock on the railroads it would be necessary to rebuild numerous costly structures, from one end to the other of the system, on the high seas there is absolutely no restriction to size, and the only changes that are necessary to accommodate these mammoth steamships are those incidental to the deepening of harbor channels and the provisions of docks of sufficient length and capacity.

There are now under construction three freight and passenger steamships which will exceed in size any-

thing now afloat, not even excepting the "Oceanic." Two of these, which are being built by the Eastern Shipbuilding Company, New London, Conn., for the Great Northern Steamship Company, are intended to ply between Seattle, the terminus of the Great Northern Trans-Continental Railroad, and Oriental ports. The third vessel, which is being built for the White Star Company, is nearing completion at the yards of Harland & Wolff, Belfast. The New London vessels will be, primarily, cargo boats, but they are also arranged to carry a very large number of passengers. Although these ships are only 630 feet long—or 74 feet less than the "Oceanic," which is the longest ship in the world—they have 4 feet 8 inches greater beam, the beam of the new boats being 73 feet, against 68 feet 4 inches, and their molded depth is greater. So large is their midship section that on their maximum draught it is estimated they will displace 33,000 tons. On a maximum draught of 35 feet, the displacement of the "Oceanic" is estimated at 32,500 tons. The new passenger steamship for the White Star line, which will be launched at Belfast, April 4, will be a larger ship than the "Oceanic," larger, indeed, than the two New London vessels. Her length is to be 700 feet, or 4 feet less than that of the "Oceanic," but her beam is to reach the unprecedented width of 75 feet, and her estimated maximum displacement will be about 36,000 tons.

A comparison of this beginning-of-the-century vessel with those at the commencement of the last two decades proves at what an astonishing rate the dimensions of the modern steamship are growing. In the commencement of the year 1881 the longest and the largest steamer in the world was the "City of Berlin," now the "Meade" of the United States army transport service. She is 520 feet long, and her displacement is 8,000 tons. Ten years later, in 1891, the "City of Paris," 560 feet long and about 16,000 tons displacement, was the largest vessel afloat, while in the year 1901 the largest vessel will have a length of 700 feet and a displacement of 36,000 tons. It will be noticed that the displacement, which is the true measure of a vessel's size, has doubled during the one decade, and more than doubled during the next. If this rate of increase is kept up, the question arises, What kind of ships will be building when the century is two or three decades old? The dimensions would be so huge that one hesitates to put them down in sober print.

## DECISION AGAINST THE BERLINER MICROPHONE PATENT.

In our last issue we referred briefly to the decision, rendered in the United States Circuit Court at Boston, Mass., on February 27, declaring to be void the patent issued to Emile Berliner November 17, 1891, No. 463,565, for a telephone transmitter.

This patent was previously sought to be annulled by the United States, on the ground of collusion and fraud between the holders of the application (the American Bell Telephone Company) and the Patent Office in delaying its consideration and issue. But the United States Supreme Court rendered a decision May 10, 1897, affirming the decision of the court below, stating that no fraud had been established, and dismissed the complaint. The merits of the invention were not touched upon, although facts were established proving beyond a doubt that Berliner had been anticipated.

One peculiar fact in the case is that the drawings in his first patent of November 2, 1880, were precisely the same as those of the 1891 patent, but the claims in the latter were enlarged to conform to the variable-pressure principle between the electrodes, then in use, and designed to cover a new art, method, principle or process. About this the opinion says: "The attempt to expand Berliner's unsuccessful experiments and caveat first into an invention, and next into a broad claim for an art, method, principle, or process, exhibits a remarkable degree of ingenuity, but is not convincing."

Having won its case on the fraud issue, the American Bell Telephone Company undertook to stop the use of the microphone transmitter, based on the 1891 patent, by bringing suit against two well-known competing companies, which has ended in the present decision.

The full text of the rescript of the decision by Judge Arthur L. Brown, declaring the 1891 patent void, will be found in the current SCIENTIFIC AMERICAN SUPPLEMENT, and is very interesting in its array of facts and reasoning by establishing the authorship of successful telephony.

A few of the points in the decision are that the patent is invalid because at the date of the application, June 4, 1877, the invention then described was different from the subsequent patented invention. His first description covers a make-and-break contact, and does not mention the constant contact, or variable-pressure idea, as stated in the final patent of November 17, 1891. His apparatus was similar to the old Reis, and because that could be made operative in the hands of experts, did not establish invention by Berliner.

As an inventor of apparatus, he cannot base a sole claim to invention founded upon an alleged discovery of a new capacity in old apparatus. He did not "embody" an invention in apparatus, unless he succeeded

in making the old apparatus perform Bell's process upon the current.

Another point is that the patent of 1880 preceded and invalidated the second patent, and that the Commissioner of Patents exhausted his power to issue a second patent by issuing the first, though the title of the latter might appear to be different from the second.

A further ground is that Edison in his solid button transmitter patent antedates all Berliner's dates, Edison going back to April 20, 1877.

Still another fact shown is that Bell's patents cover all forms of variable-contact transmitters. Bell's liquid transmitter and Edison's devices precede all.

In the following emphatic conclusion, the Judge says: "I am of the opinion that the defendant's transmitters are an invention substantially distinct from that disclosed in the Berliner patent; that the conception of Edison of the use of carbon for speech transmission preceded Berliner's conception of the use of solid, metallic electrodes; that, from his first conception, Edison diligently proceeded upon a line of experiments that led to an invention of remarkable character, which borrows nothing from Berliner, has no substantial resemblance to what is shown in the Berliner patent, and cannot be identified with it by any ingenious use of language. The defendants owe nothing to Berliner."

While it is probable an appeal will be taken to the United States Circuit Court of Appeals, it is not likely, in view of the evidence disclosed in this case based on well-known historical facts and documentary proof, that this decision will be reversed. The decision can have none other but a beneficial effect upon all telephone enterprises, including manufacturers and telephone companies. The rapid expansion and use of the telephone in many fields in the future may now be predicted with an economy in cost at present claimed to be unattainable.

## CURIOSITY AND SCIENCE.

Curiosity, it may be safely said, is the handmaid of science. And to the men who have found something mysterious in the common occurrences of life, and whose curiosity has been sufficiently aroused to unravel the mystery, we owe much of the progress we have made along almost every line of thought. It is true that the explanation of the mystery may require an extraordinary logical power and an imagination with which not all of us are blessed. But, nevertheless, the process of reasoning which has led to the greatest discoveries may be largely attributed to the very human impulse of inquisitiveness.

No doubt many a man before the time of Columbus had remarked the exotic fruits and branches tossed up by the waves of the Atlantic on the shores of the Canary Islands. Such fruits had never been seen in the Old World; yet the islanders had picked them up from time immemorial with never a thought as to whence they might come. But the Genoese mariner had both curiosity and imagination. To him these strange gifts of the sea became messages sent from a land which no European ship had ever touched. It may be that he was mistaken in his conception of that land; but the fact remains, if the story can be credited, that then the voyage of exploration which culminated in the discovery of the New World was first planned.

Then we have Newton's apple. It matters little whether or no the apple did fall, or opportunely strike Newton while he was sitting in his garden. Things have fallen ever since the universe was created. And yet no man seems ever to have asked himself: Why?

Robert Mayer, a ship's surgeon, cruising in the East Indies, noticed that the venous blood of his patients seemed redder than that of people living in temperate climates. Doubtless other physicians had also noted the fact. Mayer pondered over this apparently insignificant difference in venous blood and reached the conclusion that the cause must be the lesser degree of oxidation required to keep up the body-temperature in the torrid zone. And it was this conclusion which finally induced him to look upon the body as a machine driven by external forces. The thought led to the discovery of the mechanical theory of heat and to the first comprehensive appreciation of the great law of the conservation of energy. Blood-letting is a time-honored practice which is now fallen out of favor. But an inquisitive and discerning physician deduced from it conclusions so marvelous that he has been called "the Galileo of the nineteenth century."

Chemists speak familiarly and learnedly now of the law of substitution by which they are enabled to explain so many of the eccentricities of carbon compounds. The discoverer of that law was a curious Frenchman named Dumas, who was once invited to a court ball given at the Tuileries. A strong and penetrating odor pervaded the royal ballroom. The guests coughed and sneezed. Dumas also coughed and sneezed, and wondered why. He tells us that he finally recognized the odor as that of hydrochloric acid, and found that the wax tapers by which the ballroom was illuminated had been bleached with chlorine. Ex-