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THE PROBLEM OF THE NEW CRUISERS.

So serious do we consider the proposal to provide our six new cruisers with the very low speed of 16½ knots and a deck that is only partially protected, that we shall take up this question again in our next issue and present further facts and an illustration of the proposed ships which is being prepared from the official drawing. We take this opportunity of drawing attention to the fact that the proposed displacement of 3,400 tons for these ships as given in the comparative table published in our last issue has been raised to 3,500 tons and should so read in the table. Starting with a displacement of 2,500 tons, as authorized by Congress, the maximum displacement was raised first to 3,400 and finally to 3,500 tons.

THE STRATFORD TROLLEY DISASTER.

In our last week's issue we gave illustrations of the bridge at Stratford, Conn., and an outline of a plan showing how the accident might have been prevented.

We note that the verdict of the coroner's jury, which was rendered on the 17th inst., confirms our view of the matter; first, that by reason of the rapid running of the car and the defective condition of the approach adjoining the bridge, the car was derailed; second, that the stringer or guard rail outside of the track, although of the style generally used on all railroad bridges, was not effective in this case by reason of the speed and momentum of the car; third, that the car approached the bridge at a dangerous rate of speed; fourth, that the motorman was guilty of criminal carelessness in running the car at such high speed.

The Shelton Street Railway Company is found very negligent in allowing the track to be insufficiently filled in and supported by earth near the bridge abutment, and in view of such condition to neglect to have a constant, all-day inspection. The jury also recommends:

First, that all cars be required to stop before crossing the bridge 30 feet distant from either end of the bridge.

Second, that all trolley bridges have inside guard rails and that the outside guard rail be not less than 8 inches high and be lined with iron.

Third, that motormen be required to be examined before a competent board and be licensed.

Fourth, that the working hours of motormen and conductors be reduced, and that they be allowed a reasonable time for their meals.

Fifth, that in view of the growing trolley mileage and its further extension, the Governor of the State be requested to specially convene the Legislature for the purpose of creating a commission whose duty shall be to supervise the construction and operation of trolley lines.

We think these recommendations are particularly timely, and should have the effect of compelling all companies to put the tracks over bridges in the best of order, so that they will be safe against any possible emergency that may arise in consequence of the neglect or carelessness of motormen.

A NATIONAL OPPORTUNITY.

The awful desolation which has fallen upon our newly-acquired possession of Porto Rico has aroused the compassion of the civilized world, and sympathy with the stricken inhabitants is already manifesting itself in the active measures of relief which are being taken in various parts of the globe. It is to the United States, however, as the parent country to whose guardianship they have only recently committed the interests of their island that these homeless and starving people turn in their hour of extremity, and we shall be false to our trust, to our traditions, and to our reputation as a generous, and warm-hearted race, if we fail to make an immediate and overwhelming response.

The active measures of relief which were started immediately upon the receipt of Secretary Root's letter to the mayors of the cities throughout the country show that the cry of the Porto Ricans will not be unanswered; but the danger of the situation lies in the fact that the country may fail to appreciate the absolute thoroughness with which the hurricane did its work, and the enormous amount of supplies which must be poured into a country from which both the people's homes, and the season's crops upon which they were to subsist, have been swept away. An American physician who was in Ponce during the storm states that the hurricane which devastated the island destroyed every stalk of sugar cane, every coffee tree, and every banana tree in its path, and sent the starving peasants trooping in from the interior to find an equal desolation on the seaboard. The official estimate by our military governor is that two thousand have been either killed outright or have died from injuries received during the hurricane. The number of homeless has been roughly estimated at over one hundred thousand.

The war to which we owe our present possession of Porto Rico was undertaken in the interests of humanity and not with the idea of conquest or possession. The statement to this effect was received with the ironical skepticism which was to be expected, and our present government of the islands which have passed into our care is being closely and curiously watched by those nations who believed that it was conquest and not humanity that prompted the declaration of war. In the relief of the Porto Ricans we have a splendid opportunity to prove that, unlike our predecessors in the tenure of the island, we hold it rather for what we can impart than what we can take away. It has ever been a part of "the white man's burden" in the work of civilization to carry the hunger and pestilence-stricken millions through their hours of sorrow, and we must see to it that these helpless people are both fed and clothed and housed, not merely for a day or a month, but until the exigencies of the situation permit them once more to become self-supporting.

But while the present sad plight of the Porto Ricans is largely due to unpreventable natural causes, its recurrence may be to a very great measure prevented by executing the proper engineering works for the control of the tropical floods. We are assured by a Porto Rican who was long resident in the island that it will be found that most of the destruction and fatalities were due to the floods and not to the violence of the hurricane. The island is traversed by a mountain range from which innumerable ravines, each with its own stream running through it, descend to the sea. During six to eight months of the year these streams are dry, but during such rainstorms as accompanied this hurricane, they become raging torrents. The topography of the country is such that it would be possible to impound these torrential waters, and utilize them for irrigation of the lowlands during the long dry season. By constructing a system of reservoirs, and by canalization of the larger streams, it would be possible, if not entirely to prevent, or least to control such devastating floods as have just occurred. The provision of such a system was frequently urged upon the Spanish government, and its execution, now that the island has passed into our hands, should receive the earnest consideration both of the government and the capitalists of this country. Such a system of works, following upon the efforts which are being made to meet the present emergency, would be a signal evidence of our desire to better the pitiful conditions under which this island has so long existed.

ACCURACY AND STYLE IN SCIENTIFIC WRITING.

In no profession, not even in belles-lettres, is the art of literary expression of such pre-eminent importance as in scientific writing. So much depends upon the accurate use of words and upon the manner in which they are grouped to convey the author's ideas, that it is surprising how little attention is paid by a large proportion of the writers of scientific articles to literary technique. Each mail brings to the editor's desk many contributions which, although they often contain subject-matter of considerable worth, are rejected because of their looseness of expression and general lack of literary merit. No doubt much of the difficulty experienced by the average student in mastering some apparently obscure scientific exposition is due to the author's inability to express himself with that clearness which is so essential to all forms of good writing. Popular science, in the opinion of many, is often a poor kind of science; but it owes no small share of its popularity to the perspicuity and simplicity which has characterized the style of its writers.

No man has greater need of a masterly command of the technique of his language than the scientist. He should devote much of his time to analysis in the verbal laboratory as well as in the chemical and physical, in order that he may habitually select his words and frame his sentences with a careful regard for their fitness to convey exactly and lucidly the thought in his mind. What is implied by literary technique is admirably told in the introduction to "Pierre et Jean," in which Guy de Maupassant narrates how under the rigorous training of Flaubert he was made to individualize an object so as to distinguish it from all others. One of the passages bears so directly on the topic under discussion, describes so admirably in its nervous French how Flaubert taught the youthful Guy to acquire skill in literary expression, that we cannot refrain from quoting it here:

> "When you pass," he (Flaubert) said to me, "a grocer seated in his doorway, a concierge smoking his pipe, a row of cabs, show me this grocer and this concierge, their attitude, their whole physical appearance; suggest by the skill of your imagery their whole moral nature, so that I shall not mistake them for any other grocer or any other concierge; make me see by a single word wherein a cab-horse differs from the fifty others that follow or precede him. . . . Whatever may be the thing which one wishes to say, there is but one word to express it; but one verb to animate it; but one adjective to qualify it It is necessary to seek this verb, this adjective, until they be found, and never to be satisfied with anything else."

A method so painstaking and refined would perhaps tend to destroy a writer's freshness and spontaneity; but for the scientist we cannot imagine a better course to be pursued.

The novelist or the essayist undoubtedly has an advantage over the scientific writer in so far as his subject is apt to be lighter, more easily followed, and, perhaps, more fascinating to the average reader. The mental effort of glancing through a novel or light magazine article is less than that of reading a treatise on stellar chemistry or biology; but it is within the power of a brilliant stylist, like Huxley, to render the effort pleasurable, even though the subject-matter be abstruse or in a popular way unattractive. The inaccurate use of a word in the one case has but little effect upon the context, and, indeed, may even be unperceived by the reader. In a scientific article, on the other hand, an expression carelessly used may render a whole passage obscure, or completely distort the meaning of a sentence. Hence, as some one has cleverly said, the aim of writing, and especially of scientific writing, is not that one may be understood, but that one may not be misunderstood.

Upon a vast number of readers, unfortunately, the refinements of literary art are lost. To many it is a matter of no moment whether an author vary the beginning of his sentences, whether his figures be apt and correctly employed, or whether he show discrimination in the use of words. But although the reader of a scientific article may not appreciate or make any note of the literary style of a writer, the result on his mind of clear exposition, terse description, and logical sequence of ideas is immediate and sensibly gratifying.

"COLUMBIA" AND "SHAMROCK" IN LIGHT WEATHER.

In our issue of August 12, we made a careful comparison of the speed of "Columbia" and "Shamrock," based upon their performance in wholesail breezes. At that time "Columbia" had not had an opportunity to test herself in light airs against "Defender" in a match race, nor were reliable particulars of the second "Shamrock"-"Britannia" race, which it will be remembered was sailed in a very light wind, at hand. During the past two weeks, however, the cruise of the New York Yacht Club has afforded several light weather tests, in which "Columbia" has shown remarkable speed, winning from "Defender" by even greater margins than her owners had looked for. At the same time the expert accounts of the race in light winds between the two English yachts show that "Shamrock" is also at her best in a four to six-knot wind.

The Yachting World, which thinks the "Shamrock" has an excellent prospect of winning the cup, says that the only real test in the second race was a beat in a steady wind from Cowes to the Norman Fort, a distance of nine miles, in which the challenger beat "Britannia" by twelve minutes. At this rate, she would beat "Britannia" by twenty minutes in the windward stretch of 15 miles on a 30-mile windward and leeward course. The same authority estimates that, in light winds, "Shamrock's" superiority to "Britannia," over the New York Yacht Club course would be from twenty-five to twenty-eight minutes.

Now, in 1895 "Defender," in light airs, beat "Vigilant" over a twenty-four mile triangular course by eighteen minutes, although it was estimated at the time that, allowing for shifts of the wind favoring "Defender," the advantage was about twelve minutes. This would amount to fifteen minutes in the thirty miles. "Columbia" has beaten "Defender" by nineteen minutes in twenty-three miles, the race being sailed at the average speed of about five knots an hour. This would amount to twenty-five minutes in thirty miles, and adding the fifteen minutes by which "Defender" has beaten "Vigilant," we find that "Columbia" is forty minutes faster than "Vigilant" or "Britannia" over a thirty-mile course in light winds. This agrees with the results in the recent cruise, where "Columbia" showed an advantage of nearly an hour over "Vigilant," the latter sailing in her cruising trim. In light airs, then, "Columbia" would appear to be from twelve to fifteen miqutes faster than "Shamrock" in thirty miles.

These results are not inconsistent with those arrived at in our comparison of the boats in wholesail breezes, in which "Shamrock" appeared to have a slight advantage on a windward and leeward course. For a boat that is canvased for light airs may be relatively indifferent in a strong wind. "Valkyrie III." won from "Britannia" in a light wind by over eighteen minutes; but

"Britannia" turned the tables by beating the big cutter by between three and four minutes in a strong breeze, and, similarly, "Columbia" was only one or two minutes ahead of "Defender" at the end of a 37-mile race sailed in a stiff breeze at the rate of over 12 knots an hour.

THE HEAVENS IN SEPTEMBER.

BY GARRETT P. SERVISS.

With the fall of the year the glories of the southern heavens depart, but high in the north the splendor of the stars is enhanced. September witnesses the beginning of the reign of the "royal house of Cepheus." Opposite to the Great Dipper, as it sinks toward the horizon westward from the pole, will be seen rising Cepheus, Andromeda, Cassiopeia, and Perseus. Cepheus lies between the head of the Northern Cross (Cygnus) and the Pole Star. Just east of Cepheus is Cassiopeia, unmistakable on account of its curious zigzag figure, formed by five stars, four of the second and one of the third magnitude. South of Cassiopeia is Andromeda, marked by an extended row of four stars, three of the second magnitude, the most westerly and southerly standing at one corner of the Great Square of Pegasus. Following Andromeda and Cassiopeia from the northeast comes Perseus, the hero of the world-famous story which gave this group of constellations to the map of the sky. The Milky Way, running in bright reaches from Cygnus downward through Cassiopeia and Perseus, adds its sheen, like a royal baldric, to the beauty of their stars. Between Cassiopeia and Perseus even a careless eye detects a curious shining spot. It is the celebrated gathering of minute stars constituting the "sword handle" of Perseus, and is one of the finest objects in the heavens for a low-power telescopic view. An opera-glass shows many of its twinkling multitude. Draw an imaginary line from the Pole Star through the bow-shaped row of stars marking the middle of Perseus, and extend it about ten degrees further south, and it will lead the eye to a little lone group, the brightest member of which is very famous under the name of Algol. It is, perhaps, the most remarkable variable star in the heavens. There will be a minimum of Algol on September 11 a little before 10 o'clock P. M., Eastern standard time.

THE PLANETS.

During September four of the planets will be in the constellation Virgo, viz., Mercury, Venus, Mars and Jupiter. Two of them, Jupiter and Mars, are in that constellation at the beginning of the month. Mercury and Venus enter it later, moving eastward from Leo.

Mercury is a morning star, reaching its greatest western elongation on the 5th, when it should be conspicuous before sunrise, since it is then within a few days of perihelion and consequently nearly at its greatest brilliancy. No planet undergoes such alternations of light and heat as those of Mercury. When in perihelion the sunlight falling upon its surface is more than twice as intense as in aphelion. At the end of the month, Mercury passes behind the sun, emerging as an evening star in October.

Venus is also a morning star, but much nearer the sun than Mercury, and on the 16th it will pass behind the sun in superior conjunction.

Mars, in Virgo, is an evening star, but inconspicuous.

Jupiter, in Virgo, is also, of course, an evening star, showing bright in the west after sundown. About the 6th Jupiter crosses the line from Virgo into Libra.

Saturn, in Ophiuchus, just north of Scorpio, will remain a conspicuous evening star during September, gradually drawing westward and setting earlier. Its brightest satellite, Titan, will be south of the planet on the 2d and the 18th, west on the 6th and the 22d, north on the 10th, and east on the 14th.

Uranus, in Scorpio, and Neptune, in Taurus, although wide apart, are both evening stars.

The sun enters Libra, and the astronomical autumn begins, on the 23d at 1 A. M., Eastern time.

THE WALTHAM WATCH TRADE-MARK.

A most interesting decision was rendered a few days ago by Judge Townsend in the United States Circuit Court for the Southern District of New York, in the case of The American Waltham Watch Company vs. Joseph H. Sandman.

The complainants, Messrs. Robbins & Appleton, are the makers of the well-known "Waltham" watch which is held in such high estimation both at home and abroad.

The following is a brief summary of the principal points in the decision:

Complainant is and has been for nearly fifty years a manufacturer of watches at Waltham, Massachusetts; it was practically the pioneer in the watch business in this country; prior to 1854, the date of the establishment of its business, only two attempts had been made in this country to manufacture watches, both of which were unsuccessful; its business has grown to an enormous extent, nearly eight millions of watch movements being sold by it, all of which, with but few exceptions, have borne the name "Waltham," and over a million of dollars have been expended by it in advertising and familiarizing the public with its watches. It appears that originally the name "Waltham" was thus used in a geographical sense, but by continued use it has acquired a secondary meaning as a designation of watches of a particular class, and purchasers have come to understand that watches stamped with the name "Waltham" are watches made by complainant.

In 1895, one E. A. Locke, for whom this defendant was sole selling agent, began the manufacture of watches at Waltham under the name of "Columbia Watch Company." Said Locke was not a resident of Waltham.

Said Locke has made watches similar in appearance to those manufactured by complainant, and stamped with the words "Waltham, Mass." They were sold for a much lower price than those of complainant.

The complainant claimed that by the use of the name "Waltham" purchasers were actually deceived into believing they had purchased the original Waltham watches, when in reality they had bought watches of defendant's manufacture.

The controlling questions herein have been elaborately discussed by Judges Knowlton and Holmes of the Supreme Judicial Court of Massachusetts in Am. Waltham Watch Company vs. United States Watch Company (Mass.) In the views therein expressed, I heartily concur.

The ground of said decisions is that such conduct is in violation of the law against unfair trade, and is intended to deceive and defraud the public and to deprive the complainant of the trade and good will to which it is entitled.

In the course of his opinion Judge Knowlton said:

"I am of the opinion that this word (Waltham) has acquired a secondary meaning in connection with the plaintiff's watches, of which the defendant has no right to avail itself to the damage of the plaintiff, and that there should be an injunction against the use by the defendant of the word 'Waltham' or the words 'Waltham, Mass.' upon the plates of its watches without some accompanying statement which shall clearly distinguish its watches from those manufactured by the plaintiff. I find that the use of the word 'Waltham' in its geographical sense, on the dial, is not important to the defendant and that its use should be enjoined. Specimens of watch movements were put in evidence by the plaintiff which showed that it would not be difficult to make prominent upon the plate, in connection with the words 'U. S. Watch Co., Waltham, Mass.' the words 'No connection with the Am. Waltham Watch Co.' or 'Not the original Waltham Watch Co.,' or similar explanatory statements."

And Judge Holmes, delivering the opinion of said court sustaining the decision of Judge Knowlton, said:

"Whatever might have been the doubts some years ago, we think that now it is pretty well settled that the plaintiff merely on the strength of having been first in the field may put later comers to the trouble of taking such reasonable precautions as are commercially practicable to prevent their lawful names and advertisements from deceitfully diverting the plaintiff's custom."

A decree may be entered for an injunction and an accounting.

DEATH OF PROF. BUNSEN.

In the death of Robert Bunsen science has suffered a most severe blow. He was almost the last of the great men who have made modern science what it is to-day. His long and useful life was filled with the most splendid achievements in many sciences, but it was as a chemist that he will be chiefly remembered.

Robert Wilhelm Eberhard von Bunsen was born in 1811 at Göttingen, where his father was a professor; naturally he matriculated at the university, studying under Gauss. He graduated in 1830, then went to Paris; he then spent a year in Berlin and a year in Vienna. In 1833 he became professor of chemistry at the Polytechnic School in Cassel. In 1838 he was appointed to the chair of chemistry in the University of Marburg, where he remained for thirteen years. He afterward went to Breslau, from whence he removed to Heidelberg; where his brilliant researches were instrumental in giving that university the high place which it occupies to-day.

Among his earliest researches were those on Cadet's Fuming Arsenical Liquid and his memoirs on the subject are classical. Next he turned his attention to the examination of the chemical changes that occur in the blast furnace, and in 1838 he proved, by accurate analyses, that by the gases escaping at least 42 per cent of the heat evolved from the fuel is lost and that in view of the ease with which such combustible gas could be collected and led off to a distance for subsequent use, a new and important source of economy in iron manufacture was rendered possible. He invented the hot blast, which has enriched every person in the civilized world. His measurement of gases coming from the furnaces was reduced to so fine a point that vast economies were introduced. His discoveries proved lucrative and he was able to travel and carry on geological investigations, of which he was very fond, in Italy and Iceland, studying volcanic phenomena in the former and geysers in the latter country. His theory of geysers is still accepted by many scientists. It was about 1841 that he began his studies on electrolysis and the electric arc. In the same year he invented the battery cell which is named after him. It was of the greatest possible use until the introduction of the dynamo. He prepared a number of metals by electrolysis which had hitherto been produced only in minute quantities. His studies in the more abstract branches of chemistry were at once recognized as of prime importance. His researches on spectrum analysis were most important and his researches and investigations smoothed the way for other chemists. Laboratories of the great institutions of our own and other lands are to-day full of the contrivances of which he was the originator and the Bunsen burner and the filter pump need only be cited. The burner in particular was one of the most valuable inventions ever made; it is used in gas stoves in hundreds of thousands of our homes, and it is equally important in metallurgical processes.

In 1852, when he accepted a call to Heidelberg, it was considered that was the greatest university to which a professor could give his services and he remained faithful to Heidelberg University notwithstanding the flattering offers which were made by the Berlin and other universities.

In collaboration with Kirchoff, he practically created three special branches of science, spectroscopy as a department of optics, spectroscopic astronomy, and spectroscopic chemistry, and we can even foretell with considerable accuracy, by means of his devices, the discovery of new elements.

In looking over the names of the scientists of the last half century, it is almost impossible to find one whose personal contributions to science for the good of the world have been so great as those of Bunsen, and the many hundreds of pupils who during the last half century have been benefited by personal contact with him are now doing the world's work in chemistry in hundreds of laboratories.

He died on August 16 at his home at Heidelberg, Germany.

JAMES RICHARDSON.

James Richardson, who was for several years a valued editorial writer on the SCIENTIFIC AMERICAN, died August 15, at Clear Lake, Sullivan County, N. Y. His death was very sudden and unexpected. He left this city in his usual health not many days since, and no word had been received from him since he reached there. He had been a sufferer from heart disease.

Mr. Richardson was fifty-nine years of age; his birthplace was in the Adirondacks. After he received his education at the Albany Normal School, he went to Kentucky and taught school for several years. He went to the front and served as a private in the Union army until the close of the war. After this he accepted a place on the editorial staff of the SCIENTIFIC AMERICAN, which he filled acceptably for a number of years.

He resigned his position on this paper to become the editor of a promising magazine called Mastery. After this his contributions appeared occasionally in the SCIENTIFIC AMERICAN.

He was the inventor of typewriters and calculating machines, and was an enthusiastic naturalist and deeply interested in scientific advancement.

DEATH OF DR. D. G. BRINTON.

Daniel Garrison Brinton, M.D., the celebrated ethnologist, died at Atlantic City, New Jersey, on July 31, at the age of 62 years. He was born at Westchester, Pa., and graduated from Yale College in 1858; then he took a course of medicine at Jefferson College, graduating with the degree of Doctor of Medicine in 1861. After a year spent in study in Europe, he entered the United States Volunteer Army and served in the medical corps in the Civil War, becoming medical director of the 11th Corps. He was finally honorably discharged with the brevet rank of Lieutenant-Colonel. He did good service in the field and in the military hospitals. It was, however, as an anthropologist that Dr. Brinton was known all over the world. He was most deeply interested in American ethnography and ethnology, and his knowledge of American languages enabled him to publish a series of books that won him world-wide reputation for profound learning. His views were original and his knowledge was unlimited. Scholars did not always, however, agree with his conclusions. We have at various times published some of Dr. Brinton's lectures, which are remarkable for their lucid style and masterly array of data.

JAPAN PURCHASES BRIDGES.

The Imperial Government Railroad, of Japan, has ordered from the Pencoyd Iron Works between seven and eight thousand tons of steel bridges which are to be delivered within a year. The order consists of 45 one hundred foot spans and a number of two hundred foot spans. This is the largest export bridge construction contract ever placed in the United States, and it goes to the builders of the Atbara bridge in the Soudan.