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"MAGAZINE SCIENCE."

The liquid air controversy—if controversy it can be called, the storm of criticism awakened by the offending article bearing entirely in one direction, though with varying strength—has produced some of the most lucid and every way admirable articles that have appeared for many months in the technical press.

The immediate and wholesale and wholesome way in which the new-born heresies were scented out, run to earth and slaughtered, is very significant, for it shows what a complete mastery science has obtained in the domain of reason, and with what jealous care she guards her own. This policing of the highways and byways of scientific thought is one of the prime obligations imposed upon scientific journalism, which not only pledges itself to keep its reading columns absolutely free from matter that savors of the "fake," or that cannot stand on its own merits, but it is forever bound to detect and expose such matter, if by any mischance it should force an entrance.

One of the most trenchant articles, traceable indirectly to the liquid air discussion, that has come under our notice, appears in a recent issue of "The Locomotive," under the title "Magazine Science." The writer is of the opinion that all science may be divided into "science that *is* so and science that *isn't* so," the first division appearing in treatises written by eminent men and in articles that appear in high class scientific journals, while "beautiful examples of the kind of science that *isn't* so" can be found in newspapers and many "popular" books. The writers of these books think that "that mythical individual, 'the average man,' cannot understand the real facts of nature, and they appear to think it necessary to tone down those facts and smooth them off and fix them up and elucidate them by 'popularized illustrations' that are more or less inaccurate, until their books, when they are completed, contain much of the second kind of science, that is, much of the science that *isn't* so." To these two broad classes the writer in "The Locomotive" would add an intermediate division, or sub-class, "so as to include the science that is *almost* so, but *not quite*." For science of this kind the name "Magazine Science" is proposed, and it is stated that while magazine science may degenerate into the kind of science that is *not* so, it seldom rises so as to be in the class that *is* so.

We think that while the three-fold classification of scientific literature given above is well made, a broad distinction should be recognized between the purveyor of science that is *not so*, as represented by the "yellow" element of the daily press, and he who prints magazine science that is *almost* but *not quite* so. For the first sins by intention, and fairly revels in its exaggerations and distortions of the truth, whereas the latter is marked by an honest intention to state the facts and only fails through ignorance or incompetence, or an underestimate of the ability of the lay reader to follow a line of simple scientific description.

The average daily press reporter (there are a few gentlemen engaged on certain high class daily journals to be excepted) approaches a scientific subject caring very little whether his dishing up of science belongs to the *is so* or *not so* class, provided it is sufficiently lurid and sensational, and amenable to the artistic requirements of "scare head" type and the broad blotches of ink which answer for the illustration end of yellow journalism. To him science is nothing if it is not sensational; it is indeed a vast and fruitful hunting ground where game of the "three to ten" variety is the object of his diligent and only too successful quest. The idea of investigating a scientific subject for the purpose of separating the true from the false, and giving the public the facts for which they pay, is so subversive of the first principles of yellow journalism as to be to its average reporter absolutely unthinkable.

It is undoubtedly true, speaking of magazine science, that in the attempt to "write down" technical and scientific subjects to the level of the average lay reader, many magazine contributors are led into phraseology and symbolism that is needlessly puerile, and derogatory to the dignity of the subject. But we must remember that in all journalism there is nothing more difficult than this art of expressing scientific fact and reasoning in the simple terms and objects of everyday life. Tyndall could do it, witness his "Heat considered as a Mode of Motion," while Huxley was and is without a peer in this respect; and though it is hopeless, and may be disastrous, for the average scientific writer to attempt the kindergarten style which "The Locomotive" condemns, we believe it should be the aim of all writers of popular science to state abstract truth or explain intricate processes or constructions in the very simplest terms and sentences with which their knowledge of the Anglo Saxon language can supply them.

THE ELECTRICAL EXHIBITION.

The exhibition opened at Madison Square Garden, in this city, on Monday evening, May 8, 1899, under the auspices of the National Electric Light Association. The association also holds its annual convention this year at the same place, during the present month.

On the opening night several exhibits were not in place, but there was enough to interest the visitor. Governor Roosevelt opened the exhibition by sending a signal over a special Postal Telegraph wire from Albany, New York, telegraphing also a congratulatory message. President McKinley also sent a similar message. These were read by Senator Chauncey M. Depew, and were followed by his opening address, given in his usual entertaining way. He alluded to the progress made in wireless telegraphy during the past year, predicting that the time would probably come when ocean liners would have the news of the day telegraphed to them each day while on their voyage over the Atlantic, or they could report at once to their home office any accident that might occur. The possibilities in this line were endless. Electricity, he claimed, did everything for us, and dwelt particularly on its use in the practice of medicine, referring especially to the Roentgen discovery.

He contrasted the way the news was communicated during the Revolution with the rapidity of the way it was received during the Spanish-American war; how the news of Dewey's great victory was flashed to the United States 6,000 miles away before the smoke of the guns in Manila Harbor had disappeared. He described the advances made in the use of electricity for transportation purposes, how rapidly it was supplanting the horse, cable and even steam power, and remarked that in previous years he had walked to these exhibitions, but on this night he was brought there by an electric automobile.

Electric vehicles form the leading feature of the exhibition, and occupy about half the floor space. There are three Western exhibitors against two Eastern, and the styles vary somewhat, those of the Eastern exhibitors being rather more solid and symmetrical in appearance.

The single-seated runabout, for two persons, is the most popular style. Next is the "Stanhope," for physicians, provided with a collapsible top. Ladies' runabouts are also a new style, and two-seated traps and surreys for four persons, of neat and light construction, may be seen, while the electric coupe is a handsome and serviceable vehicle. Delivery wagons are also conspicuous for their solidity and compactness, and one exhibitor shows an electric emergency wagon, designed similar to fire patrol wagons, but for use in an emergency in case of an accident on a trolley road.

In the heavy vehicles, power from the electric motors is applied to concentric gear wheels attached to the spokes of the wheels, but in the lighter grades large gear wheels, keyed to the driving shaft, are used, protected by a light metal casing.

The claims of the different makers, as to how far the vehicles will travel on one charge of the storage battery, vary from twenty-five to sixty-five miles, according to the character of the roads. Little is said as to construction and care of the battery, each manufacturer claiming a specialty of his own in that respect. Each vehicle is equipped with the usual controller, brake, and electrical measuring instruments, one style being supplied with a recording meter, for registering the quantity of current used. All of the vehicles are as handsomely finished as any horse vehicle.

Next in importance is the exhibit of the Ball & Wood Company at the further end of the room, where there is erected in operation a compact 300 horse power duplex compound non-condensing engine for driving two direct-connected generators. A smaller type of engine with generator also adjoins it; both run remarkably quiet and uniformly. Near this exhibit at the east end of the hall is an interesting show of electrical heating and cooking appliances in great variety, and a separate exhibit of an electric incubator by the Bausch & Lomb Company. On a small electrically heated sand bath was an egg covered by a glass cover having an aperture about half an inch square cut through the shell. Within could be seen the shape of the young chicken which should come to life in about three days. The remarkably unvarying degree of heat obtained by an electric current of uniform potential provides a perfect means for successful egg hatching. The New York Telephone Company have an exhibit of standard telephone equipments, and near their stand, close to the main entrance, is an exhibit of the application of electric motors by direct connection to various kinds of machinery, such as lathes and grinding wheels, by the Bullock Electric Motor Company, of Cincinnati, O., and the Niles Tool Works of the same State. Near this entrance the College of Electrical Engineering has a booth where novel electrical experiments are carried on. There are several exhibits of electric incandescent and arc lamps, also of insulated wires and conduits.

In the north gallery is an interesting exhibit of a field telegraph and signaling apparatus, also heliograph instruments, installed by the United States Signal Corps of the War Department. The searchlight from the destroyed Spanish cruiser "Vizcaya" is also on exhibition, and a few other relics. Prof. Henry's original electrical apparatus, loaned by the Smithsonian Institution, is also to be seen. The United States Weather Bureau exhibits a full line of meteorological instruments. Not far from this is a historical group of electric arc lights, showing the numerous improvements from 1854 to the present time.

In the south gallery is an example of wireless telegraphy; a transmitter rests on one end of a sheet of glass about twelve feet long, and the receiver at the other end with a set of dry batteries for operating a tape-recording receiver placed in a local circuit. A large sheet of copper resting on the glass and located at one edge of each instrument and connected thereto by a single wire collects the electrical waves, which travel over the glass to the opposite end. The instruments are similar to those illustrated in these columns some time ago.

The utility of electricity as an aid to the diver is graphically shown in the south basement, where a large glass-faced tank is erected, filled with water in which fishes and turtles swim about. A woman diver dons the usual costume, heavily weighted with lead, and descends beneath the surface. She takes up and pets turtles swimming about; shows how the life line is manipulated, uses an electric hand searchlight for finding property, and communicates to friends on the surface by a telephone in the helmet. Messages were quickly sent, she writing them on a slate held in her hands under water, which she would turn outward for the audience to see. It is a very useful object lesson on the art and appliances of the diver. There is also on exhibition in this basement, an X ray apparatus. The middle basement has been decorated to appear like a grotto, and the north basement is devoted to a display of the application of electricity for the illumination of theater stages and light effects.

There is to be on exhibition a radiophone and a picture telegraph apparatus. While the exhibition is not as comprehensive and varied as it might be, there is still enough in a general way and in particular lines to make it of special interest to visitors.

LOSS OF SPEED IN WARSHIPS.

The almost universal practice of crediting warships with a rate of speed based upon their trial performances is extremely misleading, at least for the general public. The contractors who build the ships and the professional men into whose care they are handed over know perfectly well that the trial trip is a "grand stand" performance, carried out under specially favorable conditions, which, in the nature of things, can never be repeated during the lifetime of the ship. Some writers upon naval affairs have boldly acted upon this conviction, and always credit warships with a speed from two to three knots lower than they made on trial.

This loss of speed is not confined to any one navy. It is noticeable in greater or less degree in the navies of Europe; it has occurred in our own. We all remember the trip of the commerce-destroyer "Columbia" across the Atlantic in the summer of 1895, in which the Navy Department determined to ascertain what speed this vessel could maintain continuously and what likelihood there would be of her being able to overtake the fastest ocean liners of the day. It took the "Columbia" a fraction under seven days to make the trip at an average speed of 18·41 knots per hour under natural draught; yet the rated speed of this vessel under forced draught is 22·8 knots, or about 4½ knots higher than this average. She was to have completed the journey under forced draught, but was unable to bring the coal to the furnaces fast enough to maintain the necessary steam pressure.

In the running fight at Santiago the average speed for the 40 miles covered was from 12 to 13 knots per hour, and yet the trial speeds of the ships that followed up the "Christobal Colon" were for the "Brooklyn" 22 knots, for the "Oregon" 16·8 knots, and for the "Texas" 17·8 knots. The "Brooklyn," it is true, had only half her engines coupled up, but the "Oregon" and the "Texas" had everything going full blast, and neither ship had been out of dry dock more than three or four months. Here we have a falling off in the "Oregon" of 4 knots, and in the "Texas" of 5 knots in speed, and this in just the very kind of emergency for which forced draught in warships was designed.

The same loss of speed was shown in a forced draught trial which took place on April 24 among the ships of