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Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Agricultural inventions, Aspirator and compressor, Astronomical notes, Baby elephant takes a bath, Bath, shower, portable, new, Boiler explosions, prevention of, Canal boat, improved, Carpelitis, etc., printing gold on Chloral hydrate, simple test for, Chloroforming during sleep, Corn magnets, Dipper, watering, improved, Drowned, perseverance with the Electric lamp, improved, Elephant, bathing, a bath, Engineering inventions, Epidemic, strange, a, Exhibition, international, Sydney, Explosions, boiler, prevention of, Fires in New York, Fog, navigation in, Fruit, preserving app. for, Gas machine, Maxim's, Gas making, simple process, Genesee Falls, utilization of, Horology, report of judges, International exhibition, Sydney, Inventions, agricultural, Inventions, engineering, Inventions, mechanical, Inventions, miscellaneous, Inventions, new, Iron, effect of age on quality, Lamp, electric, improved, Leadville mines and railroads, Magnets, corn, Materials, resistance of, exp. on, Maxim's gas machine, Mechanical inventions, Natural history notes, Navigation in fogs, Oil tanks, cannonading of, Ore separator, Edison, Pyrolytic process, new, Phyllirhoe, Bucephala, Ruggles, S. P., Shower bath, portable, new, Slate washer, novel, Specimen, rare, lost, Steamer, little, remarkable, Steamers, large, collision between, Stevens Institute of Technology, Sydney Industrial Exhibition, Tree growth, force of, Trees and shrubs, care of, Washer, slate, novel, Watches, Am., superiority of, Watering dipper, improved.

TABLE OF CONTENTS OF THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 235.

For the Week ending July 3, 1880.

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Table listing contents of the supplement by page number, including sections like I. ENGINEERING AND MECHANICS, II. ELECTRICITY, ETC., III. HYGIENE AND MEDICINE, IV. CHEMISTRY AND TECHNOLOGY, V. NATURAL HISTORY, ETC.

THE SUPERIORITY OF AMERICAN WATCHES.

The extract from the report of the judges in horology, at the Sydney International Exhibition, with the diagrams showing the comparative merit of the watches tested, given on other pages of the current issue of the SCIENTIFIC AMERICAN, cannot fail to interest our readers. There were ten exhibitors, and the inherent and comparative merits of the various exhibits were rated under ten heads on the basis of 100 points "for the highest degree of excellence." There were British, German, French, Swiss, and American competitors; and while the scores of the nine European exhibitors footed up totals ranging from 76 to 686, their average being 389, the total of the Waltham Watch Company was 981. In detail this remarkable score stood thus: Originality, 98; invention and discovery, 95; utility and quality of material, 95; skill in workmanship, 93; fitness for purpose intended, 100; adaptation to public wants, 100; economy, 100; cost, 100; finish and elegance of cases, 100; time-keeping qualities, 100. Total, 981.

The timekeeping tests were made, as the report points out, by Prof. H. C. Russell, Astronomer Royal at the Sydney Observatory; and it is especially noted that while the majority of the watches tested had been made for exhibition purposes, and specially prepared for that end, the exhibit of the American company was the ordinary and regular product of the factory, such as is finished every day. Another evidence of the superiority of the American system, as emphasized in the report, is the fact that a sixth grade Waltham watch, one of the cheapest tested, showed a better performance than many very expensive and otherwise first class watches of other makes.

The moral of the victory is happily drawn in the following editorial review of the contest and its lessons, by the Sydney Morning Herald of April 14, last:

"The report of the judges in horology, which we published on Saturday last, was a document of more than ordinary interest. The slightest glance at it will show that the judges brought no small amount of ability and industry to their task. In many other classes of exhibits judging must, to no small extent, be a matter of opinion. There is no absolute test by which one photograph, for example, or one oil painting can be decided to be superior to another. In exhibits of this kind much must be left to the taste of the critic. Watches and chronometers, on the other hand, can be submitted to the minutest tests. The care and trouble which these require are not small, but the issue is sufficiently important to warrant all the labor which the judges in horology brought to their work. Time-keepers that can be relied upon in all weathers and in all climates, and that are within reach of all classes, are a luxury of no common order, but to a large number of persons they are a necessity also. In these fast days, when everything must be done to time, it is for a variety of purposes found necessary to make accurate divisions, not merely of the days and hours, but of the minutes and seconds also. The verdict which the judges in our Exhibition have pronounced on the Waltham watches is one of which any company might be proud; but the facts on which the verdict is based are as interesting to the public at large as to the parties immediately concerned. One of the secrets of American progress lies first in the invention of machinery, and then in its application to almost all descriptions of industry. It is the bringing of machinery to every branch of watchmaking that is enabling Americans to beat the world in this as well as in many other things.

"There has been a general belief that a machine-made watch is not to be compared to one that is hand-made, and that on this account the English watch must always hold its own against the American. This belief will have to be given up, if it is not given up already. It has now been established that machinery can be used for the purposes of watchmaking with quite as much success as for those of agriculture. The Americans are showing that they can make better watches than the Swiss or the English, but, what is of equal importance, they are showing that they can make them for less money. The boast of the Yankees is that they can turn out work cheaper and better than anybody else, and that for that reason the world must take their products. It would be difficult to prove that in some departments the boast is wholly without foundation. The American mechanic is paid better than the English mechanic, and yet the work which he turns out can, as a rule, be sold for less. The reason is, not only that he works harder, but that the assistance of machinery enables him to produce the largest result by the smallest amount of labor.

"Mr. Brassey, who believes that the workmen of his own country are equal if not superior to any in the world, maintains that an English mechanic can do more work than an American mechanic. The American really does more, because the inducements to industry are greater, and because he has better machinery. The success of the Waltham Company has furnished a striking instance of this. This company has now not only well-nigh driven foreign watch-making companies out of America, but it has shown that it can more than compete with them on their own ground. This arises partly from the fact that it can turn out the best work on a large scale, but also from the fact that the principle on which it operates enables it to do all this economically. The Waltham Company claims to have arrived at simplicity, uniformity, and precision in the manufacture of watches, and the report of our judges shows that its claim is well founded. One of its discoveries was that a simple instrument, where simplicity is possible, will cost less and be worth more than a complicated one. Another was that

the making of all instruments of the same grade exactly alike, so that the part which belongs to one belongs to the whole, will not only facilitate manufacture, but will greatly economize it. A third was, that these properties of simplicity and interchangeability are the best guarantees of perfect exactitude. The success which the Americans have reached in this as well as in other branches of industry, ought to excite the gratitude rather than the jealousy of the world. Any company or nation that shows how a maximum of efficiency can be reached by a minimum of labor confers a benefit on mankind. This our American cousins have done in other spheres besides that of watchmaking. There are branches of the prosperity of the Americans that are traceable to the extent of their territory and the fertility of their soil; but the triumph of their machinery has been the result of their inventiveness and of their enterprise, and for that reason it points a moral that Australians might profitably observe."

A REMARKABLE LITTLE STEAMER.

There is soon to set sail from London for New York a new and remarkable little steamer of 70 tons gross burden, named the Anthracite, designed to exhibit the advanced engineering ideas of Mr. Loftus Perkins, of England. The distinctive peculiarities of this steamer are the very high steam pressure that she carries—350 to 500 lb. to the square inch, and the small consumption of fuel—one pound of coal per hour per horse power. A trial trip of this new little boat was lately made of 46 miles, during which 350 lb. steam pressure was steadily maintained, 132 revolutions per minute of propeller, and a speed of eight knots per hour. Other vessels, some of larger size than the above, have been built on the Perkins system, and are running in England. One of them, the yacht Emily, carries 500 lb. boiler pressure. Most of our readers are familiar with Mr. Perkins' system, which has been fully described in our columns. Those who may wish to refer thereto are directed to an interesting article by Mr. Perkins, with engravings, published in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 81, July 21, 1877; also to the description of the steam ferry boat, run on this principle, given with three pages of engravings in our SUPPLEMENT No. 217.

Engineering theory and practice have for a long time plainly pointed to high steam pressures as one of the surest ways to economy of fuel. Twenty five years ago our ocean steamers carried only 16 lb. pressure to the inch, and burned 5 to 6 lb. of coal per hour per horse power. To-day they are carrying 75 lb. pressure, and burning 2 1/2 to 3 lb. of coal per hour per horse power.

In 1840 the Britannia, one of the finest steamers of the Cunard line plying between this country and England, burned 5,291 lb. of coal for each ton of paying freight she carried, her speed, then considered fast, being 8 1/2 knots per hour. In 1877 the Britannic, speed 15-6 knots per hour, burned only 551 lb. of coal per ton of freight carried.

Although our present steamers are making fast time and are very economical as compared with the earlier vessels, still it is a lamentable fact that on the largest and finest of them, furnished with all the latest improvements and best appliances to secure economy, worked by the most careful and intelligent engineers, we succeed in putting into our steam only about one tenth of the heat realized in our boiler fire, the remaining nine tenths of the heat being lost. Only in proportion as we make our steam hotter, and expanding it more, shall we economize in fuel. In this respect the voyage of the Anthracite is designed by her owners, we presume, to be an eye-opener for steamboat owners, not only in this country but throughout the world. If a little bit of a boat like this, 84 feet long, 16 feet beam, and 10 feet deep, can carry its own coal and water across the Atlantic, with a pressure of 350 to 500 lb. to the inch, and on one pound of coal per horse power, the natural inference is that our great steamers, when fitted on the same system, will realize far better results. The change from three pounds of coal to one pound per horse power means a saving of two thirds in the coal bill, which is always an enormous item in the expenses of large boats. We ought to add that another peculiarity of the Anthracite is that she uses the same boiler water over and over, only a trifle of fresh water being supplied to make good the slight waste. Our New York steamboat men, who have to pay so dear for Croton water, will be likely to examine the water tank of the Anthracite with interest.

A STRANGE EPIDEMIC.

On the night of Tuesday, June 15, a remarkable epidemic fell upon several towns in western Massachusetts, the town of Adams suffering most severely. Out of a population of 6,000, several hundred—variously estimated from 600 to over 1,000—were prostrated by a disease resembling cholera morbus. The symptoms were first dizziness, then great nausea, followed by vomiting and prolonged purging, and in some cases delirium. A belt of country two or three miles in width and several miles long was thus afflicted, beginning at the west, the whole number of victims being estimated at from 1,200 to 1,500. No deaths are reported.

The cause of the epidemic is not known, but seems most likely to have been atmospheric. For some time the weather had been dry and hot. A heavy local rain fell during the evening, and was followed by or attended with a sudden and great lowering of the temperature. A chilly fog hung over the belt of country invaded by the disease, and a heavy "swampy" odor and taste were in the air.

The malady reached its climax in about twenty-four