Weston's Walk of Five Thousand Miles in One Hundred Days.

Since March 18, 1884, I have had the opportunity of making two careful physical examinations of Mr. Edward Payson Weston, who between the hours of nine and ten o'clock on Saturday evening, March 15, 1884, completed at the Victoria Coffee Hall, near Waterloo Railway Station, London, the very remarkable feat of walking five thousand miles in one hunded days. The walk thus accomplished was carried on partly out of doors on common roads, and partly on covered tracks; part, that is to say, up hill and down dale in all weathers belonging to the months of November, December, January, February, and of March, and part on a level plain, under shelter. The out-door walking was, of course, most exposed and most laborious, but the indoor was not without its drawbacks, the chief of which was the shortness of the laps. In one track the laps were thirty-six to the mile, and made the pedestrian so giddy at the first start that he was brought nearly to a standstill. At night, also, after a day of these short laps, he continued to suffer. He experienced a sensation as if he were turning a somersault forward, just as he was going off to sleep, a phenomenon which would recur several times before he was fairly rocked into sleep. The impression on the nervous system was much like the impression of the motion of a vessel at sea on some persons after landing from a voyage.

During the effort Mr. Weston rested regularly each Sunday and on Christmas day. He did this from a desire not to cause objection to be felt respecting his task, rather than from any necessity for the rest itself. On the contrary, he would, as a matter of exercise, have preferred to have continued at his task, and have finished eighteen days sooner. The Sunday rest affected him little on the following Monday, but on the succeeding Tuesday morning it caused each time a drowsiness which impeded him more or less through out the whole of the day, and which he attributes to the circumstance that he did not get his usual sound sleep on Sunday night. In the entire walk Mr. Weston made nearly 11,000,000 steps. He averaged three and a half miles to four miles an hour. He generally rested from two to three hours during the day, but not always. On the last day he walked from Brighton to London, fifty-three miles, without resting at all; he did not even sit down, but took food and drink as he went along. He finished each day's walk by delivering a lecture, and at the close of his feat he seemed to be as fresh and vigorous as ever.

In so far as current means of diagnosis assist us, Mr. Weston stands before us a specimen of a man of as good a standard of health as we could expect to see. I do not remember ever before to have devoted so much time to the exhaustive diagnosis of any one healthy person; but tedious as the labor has been I do not regret it, since it has given me, and I hope may give others, a few hints for a mode of arriving at a standard of vital measurements. A set of standards of such measurements being supplied, we ought, by the application of the exclusive method, to make diagnosis an art of absolute certainty in most cases of disease. In the matter of diagnosis Mr. Weston has afforded ground for useful observation. But it is to physiology that he has been most useful as a subject for experiment. In this direction he gave Dr. Flint, and Dr. Flint's learned colleagues, the opportunity of bringing out, in 1870, the best report in any language on the vexed question whether, during muscular exercise, the muscular substance itself is consumed, and whether there is indication of such consumption being indicated by the increased elimination of nitrogen by the urine; or whether, during muscular exercise, it is only the fats and non-nitrogenous foods that are consumed, and that the excess of nitrogen is due to the amount of nitrogen taken in as food, not to actual consumption of the muscular fiber itself. How far this most important question is further answered by the results of Mr. Weston's latest pedestrian feats I leave for a future study; but there is one physiological truth which I must note as I conclude, namely, that the healthy condition which he represents after one of the severest physical trials on record affords the most decisive of proofs of the success of meeting physical work on good diet —sans wine, sans beer, sans grog, sans everything of the sort.—*Asclepiad.*

Determination of Cream in Milk.

The present method is a very troublesome one, and occupies considerable time. In the last meeting of the Society for Natural Philosophy in Frankfort-on-Main, Dr. Lepsius described Foxhlet's new method, which is as follows: A potash solution is added to the milk, and the latter then shaken with ether. With fine aerometers the percentage of fat can be then easily determined in the ether. It is said that while this method permits the same accuracy as the old one, it has the great advantage of great rapidity. In the same meeting the subject of the value of skimmed milk as a nutritive substance was also debated. It was generally admitted that on account of its cheap price and percentage of albuminous material—this not being at all diminished by the removal of the cream—skimmed milk is of great value, especially for the poorer classes. At the same time it was shown that milk with the cream left in it, but diluted with water, loses in value as a nutritive substance, as the same percentage of albumen is no longer contained in the fraudulent fluid. They all agreed that substances of such common use as milk should be daily inspected by a government official, and any fraudulent admixture be made widely known.

THE STEAMER AMERICA.

A new and splendid Atlantic steamer, built of steel, named the America, arrived at this port on the 5th of June, after the very rapid passage of a little more than 6½ days from Queenstown. The ship belongs to the National Line, between New York and Liverpool. On this, her first voyage, she averaged a velocity of over 18 miles an hour for six consecutive days, and on one of the days made 477 miles, being 20 miles an hour for the day, less 3 miles. The probability is she will improve on this speed; a very little improvement will place her at the head of the class of fastest steamers.

The America is 450 feet long, 51¼ feet beam, 36 feet depth. Engines three cylinder compound, one 63 inches, and two of 91 inches; stroke 66 inches. Piston valves on all the cylinders. Seven boilers and 39 furnaces. Working steam pressure, 95 pounds; 9,000 developed horse power. This ship is built specially for speed and passenger service. Her accommodations are superb.

The only steamer that has exceeded the speed of the America is the Cunarder Oregon, which made the passage in 6 days 10 hours and 10 minutes. The general public looks chiefly to the speed attained, but shipowners will be interested to know that although the Oregon arrived in five hours and a half less time, her consumption of coal was 337 tons each day, while the America burned only 190, a difference of 147 tons a day. The Oregon carried 120 engineers, firemen, and coal heavers, while the America required but 92. The difference of expense in the engine room alone is not far from $450 a day while under steam, $3,150 for each passage, and $75,600 for a year. The Oregon developed about 16,000 horse power, while the America developed less than 9,000. These figures show conclusively that the speed of the America is due entirely to her model. She is the first ship that has been built on a model looking to the passenger traffic almost exclusively for profit.

She has twelve bulkheads so arranged that she could float even if two compartments were filled by a collision. Her chief engineer is of the opinion that she would still float after her engine room has been filled by a collision. She carries 10 large life boats. The America is commanded by Capt. R. W. Grace. Mr. William Dover is chief engineer. The America carries 32 seamen in her forecastle, 92 men all told in her engine room, and 82 cooks and stewards.

The National Line has carried about 1,000,000 passengers across the Atlantic since it was organized, and has never lost a life.

Action of Light on Colors Employed for Dyeing.*

Matters relating to the phen omena which can be classed under the above heading have for a long time engaged the attention of practical men, artists, and a few scientists, and various methods of trial have been proposed for the classification, as to stability, of the colors employed in dyeing. Former State regulations, forbidding under more or less severe penalties the employment of certain of these coloring matters, have to some extent split up the substances in question into two great classes, namely, the fast and the loose, or the stable and the unstable respectively, from whichever point of view we may regard the matter. It was especially forbidden to dyers to use indiscriminately coloring matters of these two classes in the carrying out of work entrusted to them.

The investigations of Dufay and Hellot on the resistance of dyed goods to washing, etc., were certainly of great service in aiding the establishment of a proper adjustment of the two classes of dyewares, but soon the State regulations were no longer enforced, and with them vanished the check to careless work, which, although a rather awkward restriction to the dyeing trade, still did good in keeping down the production of worthless goods. The action of daylight on dyed goods was the first thing to be ascertained when experimenting on stability and resistance to altering agents in general. As is well known, the desideratum is the maximum amount of resistance to atmospheric influences, to day or sun light, to air, water, and finally soaping in many cases. Besides this, the goods require, in order to satisfy just demands made as to their power of serving, to be dyed in colors varying in intensity, brightness, and solidity, according to the different uses to which they are to be put.

Thus tissues intended for preparing artificial flowers, also those for ladies' ball and evening costumes, do not require to be exposed to much else than artificial light, and hence can be dyed with fugitive colors and in light shades. On the other hand, summer goods in the same lines ought not to be got up with any but colors stable with respect to sunlight. These may be of shades light enough to be but little altered by slight changes, but the time during which they are to be used and the price of the cloth on which they are dyed must fix the stability the colors are required to possess. The same may be said of the dyes employed for men's clothing, only, as a rule, intensity of color is not essential nor demanded, except for military purposes and for furniture goods. Furniture goods, such as cretonnes, etc., require to be dyed in colors possessing intensity and fullness of shade, together with the maximum amount of resistance to the influence of light, especially as a considerable quantity of the above mentioned goods is of a very high price, and hence requires to serve for a long time.

To-day the classification of colors in an accurate and practically available manner, with reference to resisting power, etc., is all the more essential to the dyeing trade, as it is now fast becoming the practice to employ the so-called aniline colors, not only for artificial flowers and goods of a similar class, but also for dress goods for both men and women, and for furniture. Reference may here be made to the fact that the splendid bouquet of roses got up with anilines, and exhibited at the International Exhibition in 1878, in a few weeks was modified to a livid shade by the diffused daylight. It was evidently very necessary to devise a quick and ready method of experiment, and, above all, one giving constant results. We arranged series of woolen samples dyed in different colors of the same intensity, and considered stable together, and parallel with series of similar samples and color, but of unstable character. An opaque screen was cut off one-half of each sample, and these series were exposed to the action of daylight and sunlight, under the protection of a thin glass, during one summer month. As the result of this exposure, we observed an enormous difference in the resisting power of different colors, and this difference was rendered the more striking by comparing the unaltered portion, which had been covered by the opaque screen, with the exposed and altered portion.

All, indeed, were modified to a certain extent—small, indeed, in some cases—but it was obvious that the majority of the colors obtained by the old systems, such as vat blues, Prussian or royal blues, cochineal, madder, wood colors, etc., were much more stable than Nicholson blue, fuchsine, picric acid yellow, etc. However, there is one exceedingly remarkable thing to be noticed in comparing the results obtained on one series of twenty-four samples, and that is that four of the artificial organic coloring matters stand by themselves in forming a distinct and separate class remarkable for the resisting power of its members. The four colors in question are the following: (1) The Ponceau, called "Carmin de Naphthol, coming in Class II. Red. (2) An Orange, marked II., coming in Class IV. Orange Red. (3) Chrysoine, placed under Class II. Orange. (4) Artificial Alizarine, which has, in the present state of the dyeing trade, almost driven out madder, and is much more stable than the so famous ancient article. The class numbers attached refer to the chromatic scale of colors devised by the eminent scientist Chevreul.

A copy of this scale is to be found in every Continental dye and print works, and renders service in combining and matching tints which it is not easy to overestimate. By their beauty, and their fastness and stability on wool, these four colors encourage us in the hope that chemistry will continue to render eminent services to the dyeing trade, and may finally succeed in producing whole series of colors, fast and stable, as well as beautiful and brilliant. As the power of resisting modifying agents possessed by coloring matters depends to a large extent on the methods employed in their manufacture, we may state that the colors used were presented by Messrs. Poirrier and Company, of St. Denis (Paris), in whose works they were all prepared, under the skillful superintendence of Monsieur Rosenstiehl.

* By Mons. Decaux, manager of the Gobelins, Paris.

The Laboratory that Jack Built.

This is the laboratory that Jack built.

This is the window in the laboratory that Jack built.

This is the glass that lighted the window in the laboratory that Jack built.

This is the sand used in making the glass that lighted the window in the laboratory that Jack built.

This is the soda that, melted with sand, compounded the glass that lighted the window in the laboratory that Jack built.

This is the salt, a molecule new, that furnished the soda that, melted with sand, compounded the glass that lighted the window in the laboratory that Jack built.

This is the chlorine, of yellowish hue, contained in the salt, a molecule new, that furnished the soda that, melted with sand, compounded the glass that lighted the window in the laboratory that Jack built.

This is the sodium, light and free, that united with chlorine, of yellowish hue, to form common salt, a molecule new, that furnished the soda that, melted with sand, compounded the glass that lighted the window in the laboratory that Jack built.

This is the atom that weighs twenty-three, consisting of sodium so light and free, that united with chlorine, of yellowish hue, to form common salt, a molecule new, that furnished the soda that, melted with sand, compounded the glass that lighted the window in the laboratory that Jack built.

This is the science of chemistry that teaches of atoms weighing twenty and three, and of sodium metal so light and free, that united with chlorine, of yellowish hue, to form common salt, a molecule new, that furnished the soda that, melted with sand, compounded the glass that lighted the window in the laboratory that Jack built.—*Chem. News.*

The Aeronautical Legacy.

A statement has been recently made in the papers that Charles F. Ritchel, of Bridgeport, Conn., had been made the legatee of a wealthy brewer, lately deceased, to enable him to extend his experiments in air navigation. So far as the legacy was made, the report was correct; but it is in such terms that it is doubtful that it can be legalized. Mr. Ritchel has not, as yet, received any portion of it, and he is not sanguine of obtaining a dollar from this source. The gentleman who thus showed, in his will, his interest in the experiments of Mr. Ritchel had, during his life, voluntarily aided him with funds to a small amount, but at present Mr. Ritchel's costs are borne by himself.