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(Illustrations are indicated by an asterisk.)

TO OUR READERS ON THE PACIFIC COAST.

The SCIENTIFIC AMERICAN has now a large and increasing subscription list in California, Oregon, and other Pacific States. Our professional business in those States is also increasing, which clearly indicates a healthy progress in the manufacturing and mechanic arts.

We now desire to thank our patrons and friends upon the Pacific coast for their generous encouragement, and also to remind them that a new volume of the SCIENTIFIC AMERICAN will commence January 1, 1866, at which time there are a large number of subscriptions that will expire. We make the announcement at this early date for the purpose of securing the co-operation of our friends in getting up clubs for the next volume.

Notwithstanding the increasing cost of paper, we have determined to offer the SCIENTIFIC AMERICAN in clubs of ten and upward for $2 50 per year, at which rate we hope to largely increase our circulation.

Of the future value of the SCIENTIFIC AMERICAN the past twenty years must be our guaranty. No other journal of the kind in this country, or Europe, can compare with it in the extent and value of the information which its columns supply.

Send in your clubs and subscriptions early, in order to secure the first numbers of the new volume.

FASHIONS AND TRADES.

Our ancestors, who clothed themselves in primitive fabrics, made in the plainest manner, would doubtless be astonished if they could realize the rage for unique articles of dress at the present day, and be still more surprised at the enormous consumption of them. There are cravats with all the colors of the rainbow, and a good many more not in it; there are hoop-skirts elastic, incompressible, and with countless other qualities unmentionable to profane ears; there are coats of shoddy, which, like the possessions of their owners, arise and disappear in a day; there are somber hats, shocking hats, hats invisible and waterproof, and other hats; there are boots with thick soles and square toes, with spring shanks, with rotary heels, boots with bootjacks already attached to them, and boots with wooden soles; there are shirts that pretend to be both shirt and vest together, when they are only simple shirts; and there are collars of steel, whitened by enameling, which are claimed to be all that fancy paints them. Truly, a man may wonder at the diversity and variety of human attire, and he must be critical indeed, if out of all this array there is "nothing to wear."

The manufacture of clothing in various forms is immense, and gives employment in different branches of trade to thousands of persons.

When the hoop-skirt became popular with ladies, the energies of machinists, steel rollers, and wire drawers were taxed to the utmost. The call for the steel springs was such that hundreds of persons bought sets of rollers, hired a room and power in some factory, and with a forge went into business on their own account. All they had to do was to start the wire in the rolls, run it through them into the furnace, temper it as it went, and the job was done. Of course, much of it was wretched stuff, but it sold, and that was the main thing, for it kept the market brisk and supplied.

The latest candidate for popularity is the paper collar. The rapidity with which it has been seized upon, and the extent to which it is manufactured surpasses even the hoop skirt in its palmiest days.

To say nothing of the number of collars made, which is almost beyond estimate, statistics concerning one branch of trade involved with it—the manufacture of paper boxes—will prove interesting.

One firm has a contract with paper-collar manufacturers, to furnish 11,000 paper boxes daily, for twelve months. This is but one out of numerous others in different parts of the country. Of course, with such demands upon them, the paper mills are busy, and the price is high. The men who furnish paper material are also busy; girls are busy with the boxes, in making and filling them; packing-case makers and machinists have enough to do, and, in short, every one whose business is in this line has his hands full.

That such wide-spread activity should spring from such a simple thing as a paper collar seems incredible. The impulse given to trade by this one thing ramifies in all directions. It stimulates inventors to produce better machines for making paper. It sets chemists to work on cheap processes for bleaching. It furnishes an incentive to capitalists to erect works and thereby call into requisition the services of all tradesmen in that line, and the list of persons and industries benefited by the adoption of the paper collar might be extended infinitely. Fashion does some good in the world, after all.

NEGATIVE SLIP.

Sir John Herschel remarks that the problem of the tides is one of the most difficult of any that has engaged the attention of the human mind, and it seems to us that the explanation of negative slip is of analogous character. When a fluid is acted on by contending forces, the direction and power of which cannot be measured, to determine the motion of the fluid by *a priori* reasoning, requires more than human intelligence; when, also, a ship is driven through the water by the rotation of spiral blades at its stern, the currents produced in the water, and the action of these upon the ship and upon the screw, form a problem too complicated and difficult to be unraveled by the mind of man.

That a screw propeller should exert part of its power in moving the water, and that the vessel driven by it should, consequently, move with less velocity than if the screw were running in a solid nut of metal, is precisely what would have been anticipated, but that the vessel should run faster than if the screw were revolving in a solid nut, would seem to be impossible. This strange circumstance was, however, observed in the running of the *Niagara*, and several other vessels, before its extraordinary development in the case of the *Bellerophon*.

THE "ALGONQUIN" AND "WINOOSKI" TRIAL.

Having thus far considered the circumstances of the entire trial with due seriousness, we may be pardoned if we smile at the scientific character with which the whole performance has been invested. No engineer in his senses would expect to realize economy, either by expansion or otherwise, from engines making barely fifteen revolutions, and pistons running at less than 300 feet per minute in unjacketed cylinders, with a stroke of 10 feet. It would seem as though neither Mr. Dickerson nor Mr. Isherwood are able to realize the fact that, in order to obtain economy of fuel by the aid of expansion, certain conditions must be complied with. The former apparently imagines that expansion is all-powerful, and, regarding steam as a permanent gas, he takes no account of condensation in the cylinder, and constructs his engines without the least regard for principles which English engineers know to be essential to success. Mr. Isherwood, on the other hand, selecting a single machine of a construction notoriously the worst adapted to the application of the principle, tried a few experiments, carried out and worked up with a minuteness sufficient to invest them with a false importance, and gravely states that he has tested expansion, and that there is nothing in it. We have thus the remarkable spectacle of two men, equally ignorant of the fundamental principles of the subject on which they presume to discourse, trying experiments with machinery no more calculated to decide the questions at issue—if there be a question at issue—than a pair of water-wheels; while the Government of a great nation consents to identify itself with the one, and the great nation acts as bottle-holder to the other. As it is, the correctness of a principle has asserted itself, according to the reports which have reached us, under the most unfavorable circumstances. Whether Mr. Isherwood did or did not beat Mr. Dickerson is a matter of the least possible real importance. He would find in any of our English firms a very different opponent. There is such a thing as philosophy in sport as well as science in earnest. As far as we can see, the Washington competition comes under neither head, and its value is almost infinitesimal as compared with the importance with which the American public appear to have invested it.—*London Engineer.*

We are surprised that the editors of the *Engineer*, with their extensive knowledge of steam engineering, should regard the result of running two engines under such very different conditions as the triumph either of expansion or non-expansion. Suppose the pressure of steam in the two engines had been reversed—that the *Algonquin* had run with 17 lbs. to the inch and the *Winooski* with 70 lbs.—in what way would "the correctness of a principle" have asserted itself? We have no doubt of the economy of working steam with some measure of expansion; the most economical measure varying with the pressure of the steam, the extent to which it is superheated, the velocity of the piston, and several other circumstances, but to suppose that this principle can be established by experiments like that of the *Winooski* and *Algonquin* is preposterous, as we have already pointed out.

VELPEAU ON CHOLERA.

Among those men who have devoted themselves to the study of that department of medical science which relates to the cure of disease—therapeutics—the most eminent are two Frenchmen, Pierre Charles Alexandre Louis and Alfred Armand Louis Marie Velpeau. Louis is the author of a revolution in the mode of investigating the effect of medicine on disease. Previous to his labors, while anatomy, physiology, and pathology, contained a great mass of ascertained and unquestioned facts, almost every thing in the department of therapeutics was the subject of disputes among physicians, so constant and so general that they were the theme of universal ridicule. This uncertainty was the result of the defective method employed in observing the effect of medicines upon diseases. Each physician deduced the general law from the few cases that occurred in his own practice; and even these few cases were generally observed with prejudiced minds, and in a loose and careless manner. Louis undertook the task of ascertaining the effect of the medicines in general use upon the more common diseases by a series of observations so careful, thorough, and honest, and conducted upon so large a scale, that the results would command universal respect. The great hospitals of Paris gave him the most favorable opportunity for carrying out his plans, and he went through his task in such manner that his results are accepted by physicians throughout the world as indisputable and established science.

To illustrate his method: it had been the most general practice to give antimony in lung fever.—Louis said, "Let us see whether antimony does any good in lung fever." He selected for experiment a hundred patients sick with lung fever, and divided them into two parts as nearly equal as possible in regard to age, strength of constitution, force of the disease, and all other conditions; to fifty he gave antimony in the usual quantity, and to the other fifty he gave no medicine whatever; treating the patients alike in all other respects. The effect on each patient was carefully observed and recorded. The experiment was then repeated in another hundred patients divided in the same manner.

The circumstance which has given peculiar authority to Louis' investigations, even more than their large scale, is the honesty with which they were con-