Scientific American.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS.

One copy, one year, postage included.....$3 20
One copy, six months, postage included..... 1 60

Club Rates.

Ten copies, one year, each $2 70, postage included.....$27 00
Over ten copies, same rate each, postage included..... 2 70

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VOLUME XXXIV., No. 18. [NEW SERIES.] *Thirty-first Year.*

NEW YORK, SATURDAY, APRIL 29, 1876.

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THE SCIENTIFIC AMERICAN SUPPLEMENT.

No. 18.

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Laundry Blue.

A good washing blue is made as follows: Make a solution of prussiate of potash, 2 ozs., and another of protosulphate of iron, 1 oz.; add the second gradually to the first, until the precipitate almost ceases to fall, then strain through linen, add water, add continue the washing until the blue color begins to dissolve in it, when it may be at once dissolved in distilled water and dried.

THE PRACTICAL EFFECTS OF PHYSICAL STRAIN.

Dr. B. W. Richardson, in his recent admirable work on the "Diseases of Modern Life," devotes a chapter to a subject to which we have repeatedly alluded, and to which, in view of the athletic competitions to occur during the Centennial, the attention, not only of those in training for such contests, but of those who favor athletic sports in all forms, may well be directed. We mean disease induced from physical strain, physical overwork in short, which too often reduces the fairest specimens of muscular humanity to abject wrecks. Dr. Richardson brings to the consideration of this important topic a variety of new thoughts and suggestions, and these all tend to show, first that excessive physical culture is useless, and second, that it is hurtful. The first question which he places before us is: "Do these arts contribute to the health and vitality of a race, either collectively or individually: that is to say, are they necessary in order that a race may obtain the means of subsistence, and (whether necessary or unnecessary) do they contribute to the longevity and tenacity of the life of the men or race through whom or through which they are represented? He first points out that, in a nation so uncivilized as to be obliged to trust to individual force alone for its means of life, no physical culture can be too high or too highly prized; then he shows that in a later age, when none but brute power is at man's service, the predominace of the physical over the mental faculties is still natural. But finally, removing the doctrine of necessity and separating the individual from the community, the picture is reversed. There is no evidence anywhere, he asserts, that the greater culture of the physical strength has favored the longevity of the individual or the vital tenacity of a race. All the observations handed down to us by the physicians of the Greek, Roman, Arabian, and Italian schools, reinforced by the vital statistics of modern France and Prussia, point unmistakably to the fact that in each country, within its own population, the value of life is influenced to the favorable side by the reduction of physical expenditure. A most curious instance is afforded in the history of the Jewish race, in which as a people there has never been a vestige of studied development of physical capacity. And yet the broad truth stands forth that, despite centuries of oppression and suffering, the Jewish is the first in vitality of all civilized races. Dr. Richardson gives a quantity of statistical information supporting this assertion, showing that the period of life among Jews is considerably longer than among a like number of Christians, and the causes, he says, are simply summed up in the term "soberness of life."

It is not difficult to find answers to the question: "In what manner does overwork of a physical kind injure or kill?" During life the forces by which the life is manifested are balanced against time. The active animal machine must rest and recruit; time, an absolute immateriality, flows on unceasingly, destroying as it flows silently and surely. Again, the powers or forces of the body are limited by the size and capacity of the organism. If the force put forth in a certain period be greater than that which ought to be put forth in that period, the extra force is expended at the expense of the organism itself, and, by so much as is lost in any present effort, will be so much shortened in the future. For the body is not constituted to make up time against the slightest breath of force it has once lost. Were it so, the problem of renewal of life would be solved.

Generally speaking, physical overwork injures by the destruction of those parts of the body on which the involuntary acts of life depend, namely, the muscles and nervous structures engaged in the digestion of food, the circulation of blood, and the respiration. When these organs fail, every other portion of the system dependent on these likewise succumbs. The particular characteristics of the changes induced, and of the work itself which induces such changes, are by no means complicated; and such as are noted by Dr Richardson are well worth examination, since they are the results of his own matter-of-fact observation.

The first disease mentioned is aneurism of the aorta, the large blood vessel which rises from the left side of the heart to convey arterial blood to the body. Its cause is a simple mechanical result. The heart during violent exertion (as in rowing spurts), working at high pressure, drives ahead a current of blood which, instead of making its course in steady circuit through the aorta, is brought back by concussion, and falls like a water hammer at the place where the semi-lunar valves prevent its return to the heart. This mechanically injures the wall of the artery, which loses its elasticity; and eventually the resilient tube becomes a passive pouch, ready to give way upon some extra exertion, to let out the contained blood and so cause instant death. In four cases, the author has found life terminated in this way.

The second injury is wearing out of the heart. This is common to persons who practice physical exertions, not violently but persistently. The right ventricle of the heart, which maintains the circuit of blood through the lungs, is much thinner than the ventricle on the left side, which carries the blood over the body. If this ventricle, which drives some 18,750 lbs. of blood in twenty-four hours, be overtaxed, it must necessarily weary; and as the heart not only supplies the rest of the body but also itself with food, it follows that, if it fails to supply the body, it fails to supply itself. This enfeeblement is very gradual. It begins to show itself by slight difficulties in breathing, susceptibility to fatigue, to cold and heat, to congestion of the lungs, and finally to actual organic changes of the lungs, kidneys, or nervous centers, or congestion of the venous side of the body, leading to dropsical effusion and resulting in death.

A third disease is just the reverse of the preceding, and is due to the heart becoming too powerful. Its muscular structure is unduly developed on both sides, its stroke is too severe, and, if the nervous power by which it is governed be not proportionately balanced, it becomes intermittent in its work. These conditions follow closely upon boat and foot races and all fierce competitive exercises. Of the undue action of the organ, the affected person is painfully conscious, the breathing is oppressed, the muscular tone decreased and the end of all is premature disorganization of remote organs and comparatively early death.

"By skillful training," says our author in conclusion, "it is quite true that men may be and are brought to a fine external standard; but the external development is so commonly the covering of an internal and fatal evil that I venture to affirm that there is not in England a trained professional athlete of the age of thirty-five who has been ten years at his calling who is not disabled. He may hold on sustained by a will which cannot bend to defeat; he may win bravely; then win, and only just win; then tie some new antagonist; then lose and, urged by friends whose ardor is damped, retire, but he will soon die. The falling-off which has been observed by patrons or admirers before actual failure means not want of skill nor stiffness of joint, but actual overworked, worn-out heart and blood vessels; it means, in fact, now a race for life rather than for fame."

THE VALIDITY OF PATENTS.

The inexperienced purchaser of a patent does not generally appreciate the importance of having its claims examined, and their validity and scope defined by some person experienced in such matters, before parting with his money. It is not unusual for the assignee, just as he is commencing the manufacture of articles under his recently purchased patent, to find that it is an infringement upon some previously issued patent, and that he has not only made a worthless investment, but that he is likely to get mulcted in damages if he proceeds with his manufacture. Cases are continually coming to our knowledge wherein parties have made purchases in good faith, and paid considerable sums of money on the assurances of the patentee and a mere glance at the patent, presuming that all that the drawing of the invention showed was protected by the claims, when, in fact, the point covered was almost infinitesimal. Another manner in which purchasers are sometimes deceived is that the claims, although broad enough and worded properly to cover the invention, contain a single element protected by some prior patent, which covers the very part in the new machine which is necessary to insure its efficiency. The Howe sewing machine patent illustrates this. It protected but little that any of the manufacturers cared to use, except the one small part essential to all sewing machines; and all manufacturers had to pay Howe a royalty, and he derived from that apparently trivial item an immense income.

We therefore recommend any person who is about to purchase a patent, or about to commence the manufacture of any article under a license, to have the patent carefully examined by a competent party, and to have a research made in the Patent Office to see what the condition of the art was when the patent was issued. He should also see that the claims are so worded as to cover all the inventor was entitled to when his patent was issued; and it is still more essential that he be informed whether it is an infringement, as above suggested, or not. Parties desiring to have such searches made can have them done through the Scientific American Patent Agency, by giving the date of the patent and stating the nature of the information desired.

WHAT THEY SAY ABOUT US.

We should be lacking in appreciation of a great deal of kindness did we not occasionally acknowledge a few at least of the good wishes and compliments which our labors call forth. It would be impossible to publish all or even a tithe of our correspondents' good opinions; but the limited number which we make room for may be taken as samples indicating the drift of all. A writer, to whom *Wrinkles and Recipes* has been sent as a premium, says: "I do not send you clubs to be rewarded for it, but I feel it a duty to distribute the SCIENTIFIC AMERICAN among my fellow men, because they cannot benefit themselves any better for the money, and nobody ought to be without the paper." And we, let us add, also feel it a duty, when any one kindly promotes our interests likewise, to serve his, and certainly we can do so in no better way than by presenting him with such valuable works of practical and useful information as the *Science Record* and the volume above named, or with so fine a work of art as "Men of Progress." *Apropos* of this engraving, another writer, who has received it as his premium, says: "Your beautiful engraving 'Men of Progress' came to hand: I am very grateful to you for your kindness, and I will do all in my power to promote the circulation of the SCIENTIFIC AMERICAN."

The SCIENTIFIC AMERICAN SUPPLEMENT is likewise meeting a wonderful share of public approbation. Speaking of the excellent series of illustrated articles on mechanical drawing, now in progress of publication, one writer considers them "worth much more than the subscription price of the paper;" and he adds: "While the SUPPLEMENT is so fine, it in no way lessens the value of the SCIENTIFIC AMERICAN." It enhances the worth of the older journal, we might continue, because, through the large accession of space gained by its pages, we are enabled in both journals to present not only a wider range of valuable information, but to treat the same more elaborately and completely than otherwise would be practicable. One more notice, this time from our excellent illustrated contemporary *In Door and Out*, and we terminate this tax on our modesty. "The SCIENTIFIC AMERICAN," says the editor, "like wine, has gradually grown better and better in its field of usefulness, and today has a circulation