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No. 174,
For the Week ending May 3, 1879.

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PROGRESS OF ELECTRIC LIGHTING.

While the sensational reports in regard to electric illumination have subsided, the electric light is making friends in various quarters. The Waltham Bleachery, Mass., have been using two generators of the Wallace-Farmer pattern. Ten lights supply 112 four foot gas burners. The generators require twelve horse power apiece, and the horse power is estimated at one cent per horse power per hour. It is stated that the quality of the light is good; no complaint is made of its flickering. Washburn & Moen, of Worcester, Mass., use the Brush electric light to a limited extent, lighting but a portion of one of their works. They state that they get much more light than from gas for an equal expenditure of money. No accurate experiments, however, have been made.

The Riverside Mills, of Providence, R. I., employ two Brush generators. One machine has been running about two months in a weaving room, and part of the rest of the mill has also been lighted by electricity. These mills run night and day, and use a large number of gas burners from 10 to 12 hours per day, and therefore are peculiarly well fitted for the employment of the new light. Twenty electric lamps have taken the place of 230 five foot burners ina weaving room, and give a better and more satisfactory light. The work requires an unusually strong illumination.

The lighting of the Boston Music Hall by electricity has been postponed until a larger machine of the Brush pattern can be completed. In the preliminary trials it was found that the light would be unpleasant to a general audience, and it is therefore proposed to modify its color and brightness by the employment of suitable glass or porcelain shades.

W. Mattieu Williams, F.R.A.S., in a recent paper gives an interesting resume of early English experiments on incandescence, particularly those by a Mr. Starr. The latter devised a peculiar method of winding the conductors of a dynamo-electric machine. Since the thick copper wire, usually made useof, necessarily is wound on the armatures in a spiral, there is a certain loss of compactness and an increase in resistance, which Mr. Starr proposed to obviate by using a core of square section, and winding around it broad ribbons of sheet copper, which were insulated by cementing on its surfaces a layer of silk ribbon. This ribbon is to be laid with one edge against one side of the core and carried on until the angle, then it is to be turned over so that its opposite edge may be laid along the next side of the core, and so on. It seems as if this method of winding dynamo-electric machines would have certain obvious advantages. The experiments of Starr, however, on lighting by incandescence did not result in much success, and they were unfortunately brought to an end by the untimely death of the inventor. Prof. Williams, who has devoted much attention to the manufacture of gas, believes that there is a greater field for invention in gas manufacture than in the field of electric illumination. The by products, ammoniacal salts, liquid hydrocarbons, and coke, are sufficient, in his opinion, to cover the whole cost of manufacture of gas, and leave the gas itself as a volatile residuum that costs nothing. He thinks that gas might be delivered to consumers in London at one shilling per thousand cubic feet "if gas making were conducted on sound commercial principles—that is, if it were not a corporate monopoly, and were subject to the wholesome stimulating influence of free competition and private enterprise." He therefore thinks that any comparison of the two methods of illumination based upon the present cost of gas is essentially misleading, for future invention can materially reduce the price of gas.

Prof. W. E. Ayrton also takes up the subject of electric lighting by incandescence, and proves that the electromotive force necessary to be maintained at the two ends of a wire of platinum, 5 centimeters in length and 1 millimeter in diameter, and at the ends of a piece of carbon, 2 centimeters in length and 1 millimeter in diameter, is 0·2848 volt, or about one-third of a Daniell's cell in the case of the platinum, and 0·46013 volt, or about one half that of a Daniell's cell in the case of the carbon wire. It is, therefore, possible to produce a light with an electromotive force less than that of a Daniell's cell, but not with a Daniell cell itself, since the internal resistance of the cell is far greater than that of the incandescent wire or rod of carbon. He was enabled to use the method of incandescence in 1873, when the government was employing divers to recover the property sunk in the French mail steamer Nil off the coast of Japan. An ordinary carbon rod was first scraped very thin, and then, with connecting wires affixed, it was placed in a vacuum globe; and by heating it with an electric current, and passing air through the globe, it was burnt to the required degree of thinness; the current was then stopped and the air pumped out and replaced by nitrogen. The agitation of the subject of electric illumination certainly will provoke inquiry into the subject of the cost of gas, and, therefore, ought to be encouraged.

SCARLET FEVER.

As an enemy to life and health scarlet fever now stands about where smallpox did a few generations ago. It is a contagious disease, more or less malignant, subject to wide and rapid variations in scope and severity, yet apparently rising steadily in importance as a factor of the general death rate. Just now there is scarcely a large city in which it is not epidemic.

Seeing that medical skill has been able to bring smallpox under practical subjection, there has very naturally arisen a popular feeling that medical science ought to be equal to the task of discovering a means for preventing scarlet fever, at least as efficient as vaccination has proved in the case of smallpox; and when this expectation has been unreasonably encouraged by the confident assertions of over-sanguine practitioners and theorists, that this, that, or the other drug may be counted on as a sure and trustworthy means for securing immunity from the scarlet fever, it is not surprising that people are disappointed by the failure of the medical profession to arrest the spread of the disease, now the most destructive of all the infectious diseases.

That the failure has not arisen from lack of effort on the part of the profession, medical literature abundantly testifies. That final success is not impossible no one would have the presumption to assert, though the prospects of immediate success are far from bright. The cause of the disease is as little understood as its cure. The microscope is as helpless as the telescope to detect the contagious principle, and no means for destroying it has been discovered, except a temperature higher than any patient can endure.

Inoculation seems to be almost universally attended with unfavorable results. Balladonna, so long insisted on as a prophylactic, fails to justify its reputation; and the long list of anti-fermentatives and similar remedies offers nothing that the experienced practitioner can resort to with any confidence in its efficacy.

"Indeed," says the editor of the *Medical Record*, "the logic which leads to the administration of any known anti-fermentative as a prophylactic has too unstable a ground to deserve much respect. In the first place, the question of what is the contagious principle of scarlatina has not yet got beyond the domain of probabilities. We can say, with much positiveness, to be sure, that it is no visible form of bacterium or micrococcus, and we can, perhaps, infer from analogy that it is a particulate something too small to be detected by the microscope, that it is albuminoid in composition, and multiplies at the expense of physiological processes. Whether it is living or dead, whether it is the degenerated protoplasm of man or the modified protoplasm of vegetable, whether it acts in conjunction with bacteria or feeds directly upon the tissues, all these questions are much beyond the pathologist as yet. But, in any case, it is very hard to see how anti-fermentatives can reach this virus. If it is dead, we certainly need not give such drugs to kill it; if it is living, there is no evidence or probability that the system can be so saturated as to destroy such infecting protoplasm and not the living matter of the tissues at the same time. In the blood of persons deafened with quinine or salicylic acid the bacterium disports himself with as much activity as elsewhere, and the amœboid movement of the white blood corpuscles can still be easily seen. It is a fact, to be sure, that there are drugs, like quinine, which affect the size and internal movements of the blood globules, but we cannot infer from this that there are prophylactic germicides, which will not prove to be homicides at the same time. The idea, then, we repeat, that anti-fermentatives will be efficacious, though not impossible, is inherently improbable, while the idiosyncrasy of the scarlet fever poison will oblige observers to collect a vast number of cases in order to prove the prophylactic power of any particular drug. We do not wish to discourage experimentation, but it should be remembered that therapeutics are not advanced by continually announcing on the basis of a dozen cases new powers in drugs which further experience at once disproves."

Must the problem be, therefore, given over as hopelessly insoluble? No scientific physician would admit a proposition so disgraceful to the profession. While internal medication is recognized as thus far a failure, it should still be tried experimentally—but not depended on. Ultimately a remedy may be discovered; meantime external methods for increasing the comfort of the sick, for preventing the distribution of infected epidermis, and for diminishing the exposure of the well, may do very much toward restricting the spread and lessening the malignancy of the pest. Particularly can good be done by making general the knowledge already assured for the mitigation of the disease and for preventing its distribution.

BETTER LATE THAN NEVER.

It is not an uncommon thing to hear young men complain that their early schooling was deficient in quantity, poor in quality, or—if neither of these—was wasted through boyish indifference and folly. They would get on better in life if they knew more, they are free to admit, but they do not see that they are daily wasting opportunities which, if improved, would in a few years give them a fairly good education. They think themselves too old to learn, and spend more time regretting their lack of knowledge than would suffice to give them the knowledge they need. It is said that the father of Professor Sumner, of Yale College, could neither write nor read when he came to this country, a young English mechanic. Within twenty years thereafter he was known as one of the best read men in Hartford, one of the most cultivated communities in the country. Instead of wasting his time in idle regrets for his deficient schooling, he learned to read, and read to good purpose. In a similar way many of the best, most honored, and most successful men our country has known have begun their acquaintance with letters after reaching manhood; and there is no reason why the most illiterate mechanic in our land, if possessed of natural ability and a sincere purpose, may not increase his enjoyment in life, his opportunities for improving his social and financial condition, and the chances of his family for the highest success in life, by an honest effort to retrieve by study the disadvantages by which early poverty or lack of educational opportunities has surrounded him.