LABOR AND PERSONAL CLEANLINESS.

Our attention has been called again to this subject by a statement from a committee of the Board of Health, on the condition of the street cars and the liability of their communicating disease to passengers. Referring to the line skirting the East river, which runs past many large manufacturing establishments, slaughter houses, gas works, etc., the statement referred to asserts that the cars are constantly kept in a filthy condition by workmen who enter them covered with grease and grime, and reeking with perspiration from their work. We have ourselves before noticed this fact, and have endeavored to stimulate a greater regard for personal cleanliness among workmen, but we fear with little avail.

While dirt, and dust, and soiled raiment, are inseparable from some kinds of useful toil, they are admitted even by those who endure them, to be very disagreeable concomitants of labor. Their needless infliction upon others is, to say the least, a very unhandsome thing on the part of those who could, by a little effort, cleanse themselves before crowding into a vehicle for public use, and it is a matter of just complaint. We see, however, a spirit manifested by workmen which indicates that one who tries to avoid contact with them in their besmirched state is regarded by them with disfavor. Not long since, entering a Third avenue car, we saw three men, covered from head to foot with black oil, who threw themselves into seats as though it was a good joke to soil any one's clothes that were decent. A gentleman, who quietly rose and passed to the seat opposite to avoid their contact, was abused by them, and tauntingly asked why, if he thought so much of his dress, he did not take a carriage and ride home like a gentleman.

Now it was evident this gentleman did not avoid these men simply because they were workmen. To have done this, would have forfeited his claim to be called a gentleman. It was the dirt, of which they were the nasty vehicles, he wished to escape. If workmen wish to be regarded with respect, they should avoid making themselves nuisances. One of their own craft, in cleanly garb, would have shunned these dirty and unmanly fellows.

There is no excuse for a workman, in any business, who enters a public conveyance, or even as a regular thing walks through crowded thoroughfares, in a condition that is disgusting to people of cleanly habits. Blackened hands and faces are amenable to soap and water; and greasy overalls may be left hanging in shops, or, if it be needful to carry them, they may be rolled and wrapped up so as not to be offensive to sight or touch.

There is a great lack of true manly pride among certain classes of workmen. Of unmanly pride, they have overabundance. They profess to be proud of their calling, proud to belong to the great army of producers—in this they are right; they are proud of the power of their associations, and scornful of luxury and wealth, which they claim oppress them with burdens too grievous to be borne. Were they equally proud of their personal appearance and scornful of that which is degrading in their habits, they would command more respect for their rights as members of society, and be able to enlist the sympathy of many who now stand aloof from them. Drink and dirt are the two most degrading habits of working men. No man can possess self-respect who is disrespectful to others, and no man is respectful to others who can willingly annoy them by exposing them to personal uncleanliness.

We are far from applying these remarks to all workmen, or even to the majority of them. We know many whose avocation is of a sooty order, but by whose side we would as soon sit in a car as ride next the sprucest dandy that promenades Broadway. We only ask those to appropriate what we have said, who, upon reflection, find it fits their case.

MEASURING THE HEAT OF COMBUSTION.

It has been shown, in several former articles, how the acceptance of a unit of heat, as a radical measure for the determination of relative amounts of caloric, has had most important results in placing the subjects of latent heat and specific heat in a clear light, subjects which otherwise would always have remained enveloped in much obscurity. Still more important, however, is the application of this unit to determine the results of combustion of different substances, as it settles, in the most rigorous manner, the comparative value of different kinds of fuel. At a time when steam is applied in so many and so diverse directions, or in other words, in an age when heat is continually and universally being converted into motion, the subject of investigating the nature and results of diverse kinds of combustion is of course of the utmost importance. It is an investigation of the amount of caloric or potential force hidden in the fuel, which hidden force is only changed into visible force by the intervention of evaporating water, expanding air, etc., and so the unit of heat may be directly connected with the unit of power.

In most cases, combustion is a chemical combination of the fuel with atmospheric oxygen, and in all cases it is a chemical process, by which the latent heat of dissociation is set free (see page 21, current volume). The conversions taking place always form new compounds; for instance, we convert hydrogen into HO (water), carbon into CO (carbonic oxide), or CO_2 (carbonic acid), sulphur into SO_2 (sulphurous acid), phosphorus into PO_5 (phosphoric acid) sodium into NaO (soda), magnesium into MgO (magnesia), iron into FeO (ferric oxide), etc. The amount of heat produced varies with the nature of the substance, but depends more on the amount of oxygen consumed than on anything else; so we find that the combustion of one pound of coal gives as much heat as that of three pounds of sulphur, while chemistry proves that one pound of coal is able to combine with nearly as much oxygen as three pounds of sulphur can do. The combustion of one pound of coal produces, however, only one quarter of the amount of heat produced by the combustion of an equal weight of hydrogen; but here again analytical chemistry teaches that, in the combustion of three pounds of carbon, no more oxygen has been converted into CO_2 than in the combustion of one single pound of hydrogen into HO, because the weight of O is six times that of H; six pounds of hydrogen, therefore, combine with 6×8 of oxygen, while six pounds of carbon combine only with 2×8 of oxygen.

Practical experiments with different kinds of fuel have shown, however, that this estimate of the heat produced by the amount of oxygen consumed is not strictly correct; and that other circumstances must be taken in account in order to explain the discrepancies. The principal influence on the result is the nature of the product of combustion, its gaseous or vaporous or solid condition, latent or specific heat, etc. We communicate here a table, giving the units of heat produced by the combustion of one pound of different substances, obtained by practical trial, and the amount of water which each of these substances may convert into steam, making the supposition that the latent heat of steam is 962 units of heat, and that some 150 units are required to heat the water from the ordinary temperature to the boiling point.

TABLE OF THE UNITS OF HEAT AND AMOUNT OF STEAM PRODUCED BY THE COMBUSTION OF FUEL.

Name of substance.	Formula.	Units of heat produced.	Pounds of water changed into steam
Hydrogen	H	56,000	50·4
Marsh gas	C_2H_4	23,500	20·9
Petroleum	$C_n H_{n\times 2}$	22,000	19·6
Paraffin	$C_{40}H_{42}$	21,600	18.9
Olefiant gas	C_4H_4	21,350	17·6
Oil of turpentine	$C_{20}H_6$	20,000	16 0
Spermaceti		18,000	15·6
Stearic acid	$C_{36}H_{36}O_4$	17,500	14·2
Ether	C_4H_5O	16,000	12·5
Wood charcoal		14,500	12·4
Gas coke		14,450	12·2
Anthracite coal		14,220	11·6
Bituminous coal		13,500	13·0
Alcohol	$C_4H_6O_2$	13,000	11·1
Sulphur	S	3,500	3·0

SCIENTIFIC AND PRACTICAL INFORMATION.

METALLIC DUST IN FACTORIES.

The injuries to health, arising from infinitesimal metallic particles inhaled by the breath into the lungs in cutlery and other works, are especially serious in the operation of dry grinding, used in the manufacture of steel forks. Mr. Charles Stodder, of Boston, has recently made an investigation into the quality of a similar dust produced in the process of polishing fire arms in the United States arsenal, at Springfield, Mass.; and he found that it consisted of a few organic fibers, some minute crystalline fragments, and about 66 per cent of iron and steel dust. He makes a useful and practical suggestion that magnets be placed near the grinding surfaces to withdraw the iron dust from the air breathed by the workmen; and the simplicity and feasibility of the device will ensure it a trial.

CABINETS FOR THE STUDY OF MINERALOGY.

The Department of Public Instruction of New York city has recently approved a specimen cabinet of mineralogical specimens, compiled for the use of teachers. Such a collection, if properly and judiciously selected, may be made available for laying the foundation of a highly practical technical education; and we should be glad to see similar object-teaching introduced into other branches of knowledge. The specimens were chosen and arranged by Professor E. C. H. Day, whose name is familiar to all readers of the SCIENTIFIC AMERICAN.

WINE GROWING IN AMERICA.

There is little reason to doubt that a large proportion of the territory of the United States is suited for the cultivation of grapes from which wines, not only in practically unlimited quantities but of the highest excellence, may be produced. California takes the lead of all other States in this culture and manufacture, and exhibits great variety of qualities and flavors in her productions. A writer in the *Overland Monthly* catalogues these as follows, according to the localities in which they are respectively cultivated: Sonoma county is best adapted to produce white wines, resembling those of Germany; the upper part of Napa valley and certain portions of Santa Clara county will make excellent clarets; the Sacramento valley, near the foot of the inclosing hills, is destined to produce our future sweet muscats; El Dorado county is best adapted to the production of wine resembling the far famed Burgundy; Solano county produces a wine which is a natural port; San Joaquin and Stanislaus counties give wines which closely resemble, both in flavor and taste, the best Madeira, but they have to attain an age of from five to six years before this taste is sufficiently developed; Anaheim and certain portions of Los Angelos county produce light white wines, which very closely resemble those of Chablis, in France, and they, too, must be some four years old before this peculiarity shows itself distinctly; and the last two years should be in bottle.

THE BEHAVIOR OF CADMIUM, IRON, AND TIN UNDER THE ACTION OF NITRIC ACID.

It has been observed that iron acquires, by being placed in nitric acid, a peculiar condition of surface enabling it to resist the action of the strongest acid; and a still more remarkable and important phenomenon has been observed, which is that iron so treated will form a galvanic circuit with ordinary iron, the treated metal being decidedly negative to the latter. Dr. Schönn produces further evidence of the changed character of the iron by showing that it refuses to reduce copper from the solution of its salts. He shows, also, that cadmium, in strong nitric acid, remains unacted on if platinum wire be coiled around it; but on the removal of the wire, the cadmium is at once attacked by the acid. Tin exhibits similar characteristics. The result of the experiment with iron points out electrical action as the cause of these effects, which, on further investigation, may give us some new light on the subject of electrolysis.

OBTAINING ABSOLUTE ALCOHOL.

A German *savan* has recently improved on the well known method, employed by Mendelejeff, for obtaining absolute alcohol. Alcohol of ·792 is boiled with quicklime, the pieces of the latter projecting above the surface of the liquid, for half an hour more, with a condenser inverted so that the liquid may return by its own gravity to the flask. The condenser is then reversed, and the alcohol redistilled. If the alcohol contains more than 5 per cent of water, the process must be repeated two or three times. The vessel should only be half filled with the pieces of lime, as the rapid formation of hydrate of lime may break it to pieces.

ELISEE RECLUS.

It was with much pain that we read the news of the condemnation of this eminent French geographer to a term of deportation; and we shall not be accused of political bias when we express our regret for his defection from the ranks of science to follow a chimera. Among the idiosyncracies of the talented and misguided man may be mentioned the union in one mind of the blind cruelty of the commune, and a humanity which forbade to eat meat for the reason that it is not lawful for man to slay his fellow creatures. Reclus is a native of the south of France, and was educated at Neuwied and subsequently in Berlin. His contributions to the *Revue des Deux Mondes* are well known for their learning and lucidity of style. Petitions on his behalf have been addressed to the Committee of Pardons, Versailles, having been signed by Sir Charles Lyell, Sir John Lubbock, Sir Henry Rawlinson, Professors Owen, Duncan, Tennant, Forbes, Carpenter, Richardson, Darwin, and many others. The pleadings of these men will hardly be ignored by the government of such a nation as France, and it would be a graceful act for the scientists of America to forward a similar petition, which possibly might set Professor Reclus once more free to pursue his studies and teachings for the benefit of mankind.

LEAD POISONING.

The painful effects of poisoning by lead are not by any means confined to painters, white lead manufacturers, and others whose trades bring them into constant contact with this deleterious metal. There are some persons whose obstinacy allows them to use it, in cosmetics and hair washes, in spite of the warnings of the medical profession; and the evil is augmented by the fact that such preparations may be used for years with impunity, and the palsy, paralysis, and other effects do not appear till the whole system is thoroughly impregnated. One medical man writes to a contemporary to say that he has one patient who has been paralyzed for nearly three years, her vision is imperfect, and her memory is gone; and another victim to this criminal practice has constant torture in her eyes, and is obliged to stay in a dark room. Many similar cases have been reported; but the practice still continues, and now Dr. J. M. Crocker publishes an account of a man, aged 55, who was afflicted with what appeared to be muscular rheumatism, affecting mainly the deltoid and other muscles of shoulders. When first visited, he was suffering from pains which he had felt more or less severely for a month or two. Both arms were in this manner crippled. Dr. Crocker ordered cotton batting to affected parts, lemon juice and opiates internally; and the patient made quite a rapid recovery, but when seen in the month following, he was suffering from an almost complete paralysis of extensor muscles of fingers and hands, with dropping of wrists. He could readily and forcibly grasp, but found difficulty in letting go. Subsequently, upon inquiry, it was discovered that for fifteen years he had used a hair renewer, made by himself, of three teaspoonfuls lac sulphur and two teaspoonfuls sugar of lead to a pint of water. With this he had drenched his head and scalp as often as once a week. Under use of iodide of potassium and galvanism, he has made a good recovery, the hair dressing having of course been discontinued.

THE MINERAL RESOURCES OF SOUTH CAROLINA.

Mr. A. C. Laughlin, of Columbus, S. C., informs us that corundum is found in South Carolina in inexhaustible quantities; this mineral is specially adapted for spindles and pivots of watches, and other fine machinery where the wear is constant. Sapphires and garnets are frequently found, some of the latter being perfect specimens of crystallization. Magnesian iron ore is very abundant, but is as yet almost undeveloped. Mica is another substance yielded by the soil of that state, and is daily coming into increased use. Mr. Laughlin speaks most favorably of the South Carolinian gold fields, and states that the precious metal can be obtained therefrom with great facility.

ONE cubic inch of water weighs ·03617 lbs. One cubic foot of water weighs 62½ lbs. One cubic foot of ice weighs 58½ lbs. One cylindrical inch of water weighs ·02842 lbs. One cylindrical foot of water weighs 49·1 lbs.

Mr. H. E. COLTON, an occasional contributor to this paper is now engaged on the *World* as agricultural editor.