

nace, constructed of course with a view to the development of the greatest amount of heat from a given amount of fuel. (2) A system of tubes leading to the different rooms, terminated by radiators in each room. (3) A system of reflectors to throw the heat of the furnace into the conducting tubes in beams of parallel rays, with other reflectors at the bends and angles of the tubes to direct the course of the radiations properly. The radiators in the rooms might be placed so that every portion of the room would be flooded with heat rays, yet no part be heated beyond what would be enjoyable. As nothing would enter the rooms from the furnace save pure heat, the effect would be like that of a room warmed by direct sunshine. The surplus heat of the furnace might be utilized in warming, say to 50° or 60° Fah., and an abundant supply of fresh air led in from out doors; a steady circulation being kept up from the ventilating chamber, through the rooms, by the draft of the furnace. We should have then (theoretically) perfect heating combined with perfect ventilation, and at the same time the most economical combustion of our fuel.

Possibly there may be mechanical difficulties to prevent the successful carrying out of a plan of house heating of this sort. We do not anticipate any, and the advantages it promises, on the score of health, comfort, and economy, certainly justify its trial by any one possessing the requisite means. The plan could be easily tested in the laboratory of any institution having a few lenses and reflectors.

MECHANICAL AESTHETICS AND PRACTICAL MEN.

We met our practical man, him of the street car, who "never learned nuthin' from books", at the American Institute Fair the other night. He was slowly trudging through the machinery department, apparently devoting his attention to the steam engines. We noticed that, as he scrutinized the large driving engine, his brow clouded: by the time he had reached the nickel-plated Baxter, the cloud deepened into a frown; and when he arrived opposite the Myers rotary a fierce scowl overspread his features. Suddenly turning on his heel, he recognized us, and, without further preamble, burst out with: "Now, look here, boss, I want to know if this is'n't cussed nonsense, all this 'ere frippery, nickel plate and red paint, and gildin', and stuff, about a masheen! What for, anyhow? Do'n't make the thing run no better, does it? What's the use er shinin' that Baxter like a lookin' glass? I do'n't fuss over my engine that way; much as I can do to keep the green off the brass. Have'n't had no paint near it for ten years. Do'n't see that it works any wuss, either."

We remarked that we supposed the exhibitors desired to attract public attention by uniting artistic beauty with mechanical excellence, and that the certainly augmenting tendency toward æsthetic refinement was— "Which? Oh, keep them big words for yer paper; I never was no shakes on the dictionary. Just you tell me what's got inter people, that they waste stamps on what aint no use? Look at this, now." And here he fished from his overcoat pocket a dilapidated copy of the SCIENTIFIC AMERICAN of a few weeks back, containing the engraving of the new mold-ramming machine on the front page. "What's that feller in that picture for? Or that heap er dirt and the shovel? Could'n't any practical man understand that masheen without that chap a pullin' the handle? S'pose a mee-CHANIC wants all that shadin' and prospectiv' and figgers? When I see a masheen, I want to see drawins', nice plans and things drawn out. Why do'n't yer print them, not pictures, only fit ter hang in the parlor?"

"Advantageous advertisement," we insinuated. "No t'aint, nuther," he rejoined; "no more than these ere circulars and books with fancy covers that these fellers is givin' away so loose for nuthin'. Nor them blue signs, nor that shiny engine. I do'n't do no advertisin'. Do'n't believe in it. Did'n't I try it? Did'n't I pay a dollar for puttin' my name in a pious paper printed out in Milwaukee, or Oregon, or somewheres? The chap that wheedled me in said he'd throw in a ten dollar chromo and a book about saint's rest by a man named Baxter (that engine feller, I s'pose). Did'n't get nary an answer. Catch me gettin' fooled by any nooze-paper agin!"

"No, I aint got nuthin' showin' in this Fair. Anybody that wants ter see my work can come to my shop. There aint no gold and silver and red paint there, nor patent invenshuns, nuther. Feller wanted me to buy one er them new fangled emery wheels t'other day. But I said: 'No, sonny, I used this old grindston' and others like it goin' on thirty year; and I guess I can make it do a little longer. No sir, when I git any money to waste on advertisin' or fancy paint or blamed invenshuns, then I'll shut up shop. Good night. Come see us, sometime. Aint got no cards; shop's in the alley, fourth door back on — street. There aint no sign. Just stand in the entry and yell; and if one of the boys hears yer, he'll let yer in."

Our meditations, as we watched our friend elbow his way out of the crowd, took about the following shape: Anything akin to beauty or taste, when brought in connection with the mechanical, is, by the self-called practical individual, resented as an unwarrantable encroachment. When the purpose of ornamentation is (besides gratifying the eye) thus to draw attention to the merits of an object, both end and means meet his wholesale condemnation. Strictly and purely utilitarian, he fails to see any benefit in a measure which does not instantly bring in pecuniary returns, or to perceive that increased gains are or can be due to the keeping of certain facts constantly before the world, or to presenting the same in some manner so unique as at once to attract the popular gaze. Since he cannot appreciate matters so clear to every rightly thinking observer, it is manifestly impossible for

others more refined to impress him. He and his kind see nothing to praise in the fact that our American mechanics and manufacturers (though the country is destitute of museums of industrial art, those great educators of the Old World) nevertheless contrive to mingle the beautiful with the useful, with a delicacy and true art feeling elsewhere almost unrivaled. The visitor at any of our great fairs will find this æsthetic selfculture making itself everywhere felt. It appears in the graceful figures and neat proportioning of the ordinary implements of labor, in the exquisite finish of the metal and wood work, in the thousand tasty forms of the commonest minor appliances, in the dainty traceries which embellish the safes, the carriages, and the massive portions of the engines, in a bit of carving here, a dot of bright color there: and thus through all the different productions, gathered as representatives of the varied industries.

We may here be pardoned the apparent egotism of a word as to the artistic merit of the pages now under the reader's eye, and this with reference to the "pretty pictures" objected to by our practical friend: not merely as to their intrinsic beauty, but to suggest the influence which they must exert in elevating the standard of popular taste. A diagram of mere lines may be intelligible to the professional engineer; but the man who proposes to buy a machine asks and needs a representation, showing it as it will appear when set up in the shop. True, a rough sketch would convey an idea, but we prefer to call in the aid of artists (to whom in their specialty there are no superiors), to employ the highest skill attainable in the engraving of their works, and thus to maintain a standard of artistic excellence, of the public appreciation of which we have abundant evidence.

If a little nickel plating or a neat coat of paint will render a machine (without detriment) more pleasing to the eye, it is not false economy to add such embellishment. A bright bit of glass will take the attention when a rough diamond may be a hundred times passed unnoticed; and even if ornamentation be deemed unnecessary for its attractive power, let the beautiful, where possible, be cultivated for itself alone. True art is both refining and ennobling; and it may be found in the harmony of tints in the decoration of an engine, as well as on the canvas colored by a master hand: in the molding of a tool, as well as in the forms which assume all but life under the sculptor's chisel.

SCIENTIFIC AND PRACTICAL INFORMATION.

PAINTING ON ZINC WITHOUT PAINT.

M. Puscher, of Nuremberg, has lately invented a simple process for coloring sheet zinc, based on the employment of acetate of lead. On applying this substance, mixed with a minium preparation, a reddish brown tinge is obtained. The cupola of the synagogue at Nuremberg was thus colored as an experiment over a year ago, and, to all appearance, is yet unaffected by the weather. By adding other bases, lighter or darker tints of gray and yellow may be obtained, giving the zinc work the appearance of carved stone. With a solution of chlorate of copper, the preparation turns the sheets of zinc black.

FISH BONES AS FERTILIZERS.

The *Moniteur Industriel Belge* states that German manufacturers are purchasing the fish bones gathered along the Norwegian shores, which result from the extensive fish-curing stations there located. These bones make a fine fertilizer, and, when pulverized by suitable machinery at the points of collection, are readily transported. The same journal suggests the more extended utilization of the bones from the establishments in Newfoundland, and estimates the product from American fisheries at twenty million pounds a year.

THE HOURLY DEATH RATE.

Dr. Lawson, an English physician, has recently published some curious observations regarding the time of the day when the greatest and least number of deaths occur. He finds, from the study of the statistics of several hospitals, asylums, and other institutions that deaths from chronic diseases are most numerous between the hours of eight and ten in the morning, and fewest between like hours in the evening. Acute deaths from continued fevers and pneumonia take place in the greatest ratio either in the early morning, when the powers of life are at their lowest, or in the afternoon, when acute disease is most active. The occurrence of these definite daily variations in the hourly death rate is shown, in the case of chronic diseases, to be dependent on recurring variations in the energies of organic life; and in the case of acute diseases, the cause is ascribed either to the existence of a well marked daily extreme of bodily depression, or a daily maximum of intensity of acute disease.

PEAT PAPER.

M. Bertmeyer has recently exhibited, in the Polytechnic Society of Berlin, specimens of paper and pasteboard obtained from the products of the peat beds about Königsberg, the quality of which is said to be excellent. The pasteboard was 2.4 inches thick, and sufficiently hard and solid to admit of planing and polishing. The paper made from peat alone was brittle, like that manufactured from straw; but the addition of fifteen per cent of rags produced the requisite toughness.

ARTIFICIAL EBONY.

This material is made of sawdust mixed with other substances and powerfully compressed in molds. The following is the process of manufacture, as now largely carried on by Messrs. Latry & Co., of Paris: The sawdust, reduced to a

fine powder, is mingled with a suitable quantity of water and blood, and dried at about 112° Fah. The albumen of the blood is thus agglomerated with the powder. The compound is then packed in heated molds, into all the crevices of which it is forced by strong hydraulic pressure.

A NEW RUSSIAN CANAL.

The Russian Government, says the *Revue Industrielle*, has recently completed negotiations with a Russo-English company for the construction of a canal from Cronstadt to St. Petersburg. The work is to occupy six years in accomplishment and will cost \$5,530,000. This will render St. Petersburg the finest port on the Baltic, and besides greatly benefit the city as a commercial center, since the railways to Moscow, Warsaw, and all parts of Russia will be in direct communication with the docks.

A CURIOUS PROPERTY OF SAND AND ITS APPLICATIONS.

If a quantity of dry silicious sand be placed in a bag of canvas or thin box of sheet iron, the mass, after slight compression, forms a conglomerate, capable of resisting pressures of over 60 tons. So far as the envelope is concerned, the sand within acts as if it were an enclosed solid, producing no effect on the covering except a trivial amount where the contact occurs with the load. The sand, however, remains perfectly divisible, and, no matter what may be the superincumbent weight, escapes freely though slowly out of a small aperture made in the bag or box. A simple piece of paper, however, placed over the orifice, is sufficient to stop the flow, even under the load above noted.

M. Beaudemoulin, who discovered this peculiar property several years ago, has lately published in France a work suggesting various modes of its application. For building walls it is well adapted, since the filled bags or boxes need merely be held in place by a framework; while, being very thick, they would form a protection, in case of being used for dwellings, against variations of temperature. Such walls, beside, would be fireproof. It is also suggested that for lowering heavy weights or even entire buildings, which, by a change of street level, have become located too high above the roadway, the sand bags could be placed beneath, and their contents allowed gradually to escape, thus letting the load slowly settle down.

NATURAL ANTISCORBUTICS.

General Sherman says that the *agava Americana*, or Spanish bayonet, the fruit of the common prickly pear, and the succulent leaves of some of the varieties of the cactus that abounds on the deserts of Texas, New Mexico, and Arizona, furnish excellent specifics for that horrible disease, the scurvy.

BROMHYDRIC ACID.

M. Mellie's states that a much simpler way of making this acid than that now employed, and which besides ensures a more copious supply, consists in passing a current of sulphuric acid into a small flask containing bromine. Bromide of sulphur is formed and bromhydric acid disengaged.

Intercolonial Exhibition at Sydney, New South Wales.

We have received from M. Jules Joubert, Secretary of the Agricultural Society of New South Wales, the first number of the society's *Journal*, in which are published full particulars of an exhibition to be held at Sydney in April, 1875. There is a long list of premiums, to be awarded for merit in all branches of agriculture and manufactures, the prizes for wines, sugar, and silk indicating the growth of three important industries in the Australian colonies. Agricultural implements are much required in Australia, and competition by American manufacturers is especially invited, communication *via* San Francisco being rapid and convenient.

The Secretary writes us that the Agricultural Society and the Chamber of Commerce of Sydney are, together, making liberal arrangements for an adequate representation of Australian products at our Centennial Exhibition of 1876.

An Early Opinion of Railroads.

An old copy of the English *Quarterly Review* of the year 1819 contains an account of a scheme for a railroad, on which it is proposed to make carriages run twice as fast as stage coaches. The editor evidently failed to appreciate the idea, or to believe in its possibility, for he comments upon it thus wise:

"We are not partisans of the fantastic projects relative to established institutions, and we cannot but laugh at an idea so impracticable as that of a road of iron upon which travel may be conducted by steam. Can anything be more utterly absurd or more laughable than a steam-propelled wagon moving twice as fast as our mail coaches? It is much more possible to travel from Woolwich to the arsenal by the aid of a Congreve rocket."

M. De Lesseps' plan of changing the Algerian shotts or lakes into an inland sea is shown, by a French engineer, to be little value. He has recently visited the country, and reports that the lakes are higher than the Mediterranean, and that a canal would merely drain them. Beside, the project would cost \$60,000,000, and it is difficult to see, even were the scheme feasible, any prospect of substantial returns.

PROFESSOR PURSER believes that the moon, in revolving around the earth and drawing the tides behind her, causes the latter to act as a brake on the revolution of the globe, and he considers that it may be mathematically shown that this action is slowly but surely checking the earth's speed of rotation, so that the days and nights are gradually lengthening. In a thousand million years or so, they may become each a month long.