

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

"The American News Company," Agents, 121 Nassau street, New York.
"The New York News Company," 8 Spruce street.
A. Asher & Co., 20 Unter den Linden, Berlin, are Agents for the German States.
Trubner & Co., 60 Paternoster Row London, are also Agents to receive subscriptions.
Messrs. Sampson, Low, Son & Marston, Booksellers, Crown Building, 168 Fleet street, London, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XIX., No. 13. [NEW SERIES.]... Twenty-third Year.

NEW YORK, WEDNESDAY, SEPTEMBER 23, 1868.

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MECHANICAL SKILL NOT ALWAYS ARTISTICAL TASTE.

We have frequently spoken of the value of the mechanical skill gained by close attention to, and constant practice in different branches of the mechanical arts, especially those in which manual labor enters largely as an element; and its value cannot be over-estimated. The skill that constitutes the value of a workman can be obtained only by close application and constant practice. Such skill is the workman's capital. With it he can command, if not control the market. He can make his own terms, if not ruinously exorbitant in his demands. In almost any condition of business he can secure a good position, while loud-mouthed and conceited pretenders are "sent to Coventry." The world needs—the mechanical world demands—skilled labor, the skill that springs from an innate inclination for the business, and is obtained by close practice, and, possibly, long experience.

These remarks do not apply only to manual mechanics, but also to employments only partly mechanical in their operation; for the mind or the "groove of thought" in which it moves, is also to be educated by practice, and made subjective by experience before success is thoroughly assured. Even the entry or copying clerk, the freight agent, etc., can make himself almost indispensable to his employer by a close attention to the details of his business, and a perfect familiarity with its forms.

In this office (the patent department) we have some men who, on a mere glance at a model or drawing, form an idea, generally correct, as to its value—its patentable worth. On a further examination they give an opinion, which is not often at fault. The experience of many years—their thoughts always directed in the same channel—makes them experts. Their advice is valuable, and not unfrequently our customers receive ideas and suggestions from this source which prove to be of great assistance to them. Long experience, good judgment, educated discrimination, and the mental skill dependent on experience and practice, combine to produce this result.

But there is a perfection of skill which no mere practice can give. It is the skill of taste—the instinct, if so it may be called, that comprehends the "eternal fitness of things"—that pushes rather than leads its possessor to marked excellence. It is a natural aptness for his chosen profession, a love for its details as well as an instinctive grasping of its principles. Perhaps all are not blessed with this natural fitness for their business; many round pegs try to fit square holes. Possibly it is not easy, always, to ascertain one's peculiar bent; and, possibly, some have no peculiar taste for any particular calling. Sometimes such are so versatile that they can succeed in anything they undertake; we have known such. Yet the taste that makes a Doré in art, a Roebling in engineering, a Smith in mechanics, is a fortune to its possessor, and a benefit to the world.

Our pages not unfrequently exhibit evidences of this natural skill of taste. Everyone who has compared the illustrations in the SCIENTIFIC AMERICAN, with those in other native or foreign illustrated publications, must have noticed the excellence of our engravings. An instance appears in our last issue, where a plain photograph of a simple animal trap, as it appeared on the table of the photographer, becomes a picture, full of expression, and very suggestive. See, in the faces of the rats, and even in their attitudes, the almost human expressions of curiosity, contemplation, resolution, and, finally, despair. These representations of mental exercise and emotion, and the character given to our illustrations gen-

erally, are due to the taste and skill of our artists, Mr. Louis Seitz, and Mr. Henry E. Mead, and the careful manipulation of our engraver, Mr. Richard Ten Eyck, who are unexcelled in their specialties in this or other countries. Such skill rises to the height of real genius.

We make no apology for selecting the works of our artists and engravers to illustrate the text of this article. The position of this journal does not need the perpetual blowing of our own trumpet, nor a continual reproduction of the commendations of others; else we might fill columns weekly with notices of the most favorable character. Still, it is not improper that we should refer to our corps of artists and engravers with a degree of pride, in view of the superiority of their productions. We propose, always, to employ the best procurable talent in every department. Our past success and present status prove that our discrimination between mere manual skill and natural talent is wisdom in its highest, its successful sense.

These illustrations, conveniently drawn from our daily surroundings, serve to show, in a degree, the advantage of natural bent over mere practical skill without the taste necessary to guide. In one case (the latter) perfection is attained only by continuous practice; in the other the taste of the workman eliminates crudities, perfects suggestions, and makes a merely mechanical task a labor of love. While machines, human and mechanical, can follow a plainly marked path, it is only the judgment, the instinct, the genius of the artist, in the truest sense of the term, that can make the dry bones of mechanical practice assume muscle, flesh, form, and become living representations of living ideas. Mechanical skill and constant practice can represent, either by writing, drawing, or painting, a dog, in his outlines and profile; but it requires artistic taste to reproduce the original so as to project an image of the dog on the retina of the natural eye, and at the same time convey to the mind the characteristics of the animal itself. If this is true in the representations of natural objects, appealing mainly to the eye, it is no less true of the images which appeal to the mental vision. Ideas conveyed by words alone may be either skeletons, or, perhaps, statues, or may be made living, breathing existences; one of these is the result of the skill obtained by persistent practice, and the other the skill or finish belonging only to natural taste, inclination, or genius.

PRETENTIOUS TEACHERS.

If it were not amusing it would be disgusting to witness the airs assumed by some who pretend to teach us how to preserve our health. Is there any fruit, vegetable, or meat, or drink, particularly pleasant to the palate and satisfying to the stomach, these teachers discover in it not only the seeds of death, but a fatal if not a rapid poison. Knowing something of the wants, needs, weaknesses, and frailties of "poor human nature," from our own experience, we always doubt the sincerity of those teachers who would make all men and women mere machines, to eat, drink, sleep, bathe, and dress by one rule and system. They construct a Procrustean bed for others to lie upon, but we doubt if they ever stretch their own limbs upon it. Their "best holt" is in running a tilt against everything for the stomach or palate that is tasty, nice, and gratifying. Condiments that give piquancy to otherwise tasteless dishes are their especial abhorrence.

With all proper deference to these learned teachers who preface their names with Prof., or tail them with M. D., we believe what we know—what experience has taught us—rather than accept their *ex cathedra* opinions. We believe that lemonade with sugar is better every way than without; that soda water is not unhealthful. Shall we discard sugar, and the effervescent water charged with carbonic acid gas, because somebody, assuming to teach, says these are unhealthy? Even "pure and sparkling water," drawn from nature's own fountain, the drink prepared for man by his Creator, not unfrequently holds a portion of this gas, and it is found in every sort of drink that has any "snap" to it; in cider, root, or spruce beer, mineral waters, sparkling wines, etc.

If onions are distasteful to some persons, should others not eat them? A lover of this delicious vegetable may deny himself the pleasure of eating them from a desire not to offend the fastidious olfactories of those with whom he comes in contact; but it is not necessary to insult his common sense by telling him they are acrid and difficult of digestion; for perhaps his experience of twenty years proves the contrary.

The cholera seasons of '53-4-5 were hard on cucumber growers and eaters. Hundreds seemed to believe that almost certain death lurked within the rind of the deliciously cooling vegetable, and it was not found upon their tables. Cucumber and cholera were synonymous or convertible terms. Yet we have had this grateful vegetable on our table for parents and children to freely eat, and have always, since our earliest remembrance, eaten freely of fresh cucumbers, morning, noon, and—night, without even inconvenience, not to mention cholera or colic. This much abused vegetable is a staple article of food to the fellahs of Egypt in its season; indeed, for months they eat scarce anything else. It is as much a necessity to them as the watermelon to the negroes of the South. Yet our health teachers think cucumbers are barely allowable for healthy stomachs, and advise their elaborate preparation for the table, ending the recipe by the exceedingly witty *finale*, "throw them out of the window."

Reason would seem to teach that the sense of taste, so delightful to gratify, was given by our Creator for our pleasure; yet the main aim of our health teachers seems to be utility—ascertaining what sort of food is the cheapest—and they compile long tables of chemical statistics to prove that a peck of beans is better than a quarter of beef, that oatmeal

porridge is to be preferred to a saddle of mutton; that poultry is vanity, and potatoes a costly luxury.

Children need to be guided in choice and quantity of food, and in the proper care of their persons; but if one has arrived at manhood or womanhood, without having ascertained what he should eat and drink, and what he should refrain from, there is little hope of his improving by the advice of others. What is sauce for the goose is *not* always sauce for the gander. There are individual differences in natural constitution, habits, etc., that render abortive any attempt to dictate strict rules universally applicable. Peter received a lesson (*vide Acts*, chap. x.) which our health teachers would do well to heed. There is a great deal of force in the advice given by an old Scotch divine. He told his people, "that if they wished to enjoy religion, they must fear God, and keep their bowels open."

ARE THE DIRECT RAYS OF THE SUN HEALTHY?

Much is said about the healthful influence of the sun's rays, his heat and light, and we are advised to admit this heat and light into our houses; all of which we heartily approve. The sun is the great source of health as well as of heat, and his rays undoubtedly produce a beneficial effect upon all organisms, animal and vegetable. But it may be questioned whether the direct influence of the sun is healthful. The Sepoy campaign in India severely tested the endurance of native as well as English troops, and it was found necessary to adopt coverings of white cotton or linen for the men's caps, which, from the general use of them in Havelock's army, got their name from him, and in the early stages of our recent civil war the havelock was considered a necessary part of a soldier's fit-out. The great objection to their use was the curtain, which covering the ear, prevented the ready hearing of an order. Especially was this noticeable on a parade when the execution of an order delivered by the adjutant or the colonel of a regiment would be delayed until it could be passed from company to company in the regiment. We discarded the havelock and substituted the dampened towel, or a wisp of grass, or a handful of green leaves worn in the cap. All this simply to guard against the direct force of the sun's rays.

In New York City—in every city and town—this summer and that of 1866, men dropped fainting and sometimes dead from direct solar influence. Sunstroke the last season was a most prolific cause of death, and temporary, if not permanent, insanity. It required the coolest state of the blood, the quietest condition of the emotions, and the least bodily exertion to bear up against the injurious influences of the sun. People shunned the street and hived in their dwellings, offices, and stores to escape the evil influence, which was not only a threat and warning, but a destroyer, seldom giving the warning.

Our experience and the experience of others seems to show that sea sickness is more prevalent in the summer—on sunny days—than in cold weather or on cloudy days. Persons exposed in an open boat, as fishing parties, become sick and experience nausea, when those on a large vessel, where the passengers can shelter themselves from the sun's rays, may not feel the slightest inconvenience. All of this cannot be justly attributed to the tossing of the smaller vessel, as not unfrequently the rolling of a large ship is more trying to the landsman's stomach than the uneasy and erratic pitching of a small boat. In neither case do broad brimmed hats and bonnets protect from either glare or heat of the sun's rays, as the moving ocean is a mirror with a thousand concave lens, conveying the rays to *foci*, intensifying the light and heat, and, in spite of sheltering hat brims, throwing the glare and glancing the heat from the surface of the water.

Protection against the enervating effect of the sun's rays, is best afforded by the turban, which the Orientals have used for centuries—it being, in fact, the oldest headdress known—and seldom do these children of the sunny East experience the torments or meet the fatality of our two well known *coup de soleil*.

MANUFACTURE OF PLUGS AND BUNGS.

A few weeks ago, on a trip to Lowell, Massachusetts, we visited the plug and bung manufactory of A. Bachelder, and witnessed the operation of an automatic machine for turning plugs and bungs. By the old style a series of cylindrical saws, corresponding in their interior diameter with the required diameter of the bung, were used, or a series of knives fixed to a cylinder, but they were difficult and expensive to make, and troublesome to keep in order; beside, they did not furnish a finished article. The one in use at this establishment has a cylindrical saw set at an angle to the ways of the machine, and on the other side is an automatic cutter, like a turning chisel or plane-bit, for finishing the plug. The pieces to be turned are sawed off squared sticks, the diameter of the stick corresponding with the required diameter of the plug, and the pieces cut to the right length. These blocks are fed into an upright hopper so proportioned as to deliver them properly at the bottom to two automatic, revolving centers, when they are brought under the action of the cylindrical saw which cuts off the corners of the blocks and reduces them to a cylindrical form. Soon as this is done, and before the block is released, a sharp blade rises up and traverses the length of the block, producing a perfectly smooth surface and a slightly tapering form. The action of the parts is perfect and the rapidity of the production wonderful. A boy can tend a machine, the only labor necessary being to feed the sawed blocks, and that might be arranged to operate automatically. The preparation of the blocks is simply the sawing of the stock into strips and the cutting of them

to the proper length. These plugs are made of pine, spruce, oak, etc., for bungs for barrels for holding flour, oils, spirits, beer, molasses, tar, and as plugs for shipbuilding, for the use of inspectors, and many other purposes.

The Limit of Human Thought.

In No. 12 of the present volume we published an article entitled "Progress of Chemical Science," in which we endeavored to show that there is an ultimatum in physical science which the human mind can never reach. The following extract from the address of Prof. Tyndall to the British Association, in August, so strikingly confirms the views we expressed in the article referred to that we make room for it in our present issue:

In affirming that the growth of the body is mechanical, and that thought, as exercised by us, has its correlative in the physics of the brain, I think the position of the materialist is stated as far as that position is a tenable one. I think the materialist will be able finally to maintain this position against all attacks; but I do not think, as the human mind is at present constituted, that he can pass beyond it. I do not think he is entitled to say that his molecular groupings and his molecular motions explain everything. In reality they explain nothing. The utmost he can affirm is the association of two classes of phenomena of whose real bond of union he is in absolute ignorance. The problem of the connection of body and soul is as insoluble in its modern form as it was in the pre-scientific ages. Phosphorus is known to enter the composition of the human brain, and a courageous writer has exclaimed, in his trenchant German, "*Ohne phosphor kein gedanke*." That may or may not be the case: but even if we knew it to be the case, the knowledge would not lighten our darkness. On both sides of the zone here assigned to the materialist he is equally helpless. If you ask him whence is this "matter" of which we have been discoursing, who or what divided it into molecules, who or what impressed upon them this necessity of running into organic forms, he has no answer. Science also is mute in reply to these questions. But if the materialist is confounded, and science rendered dumb, who else is entitled to answer? To whom has the secret been revealed? Let us lower our heads and acknowledge our ignorance, one and all. Perhaps the mystery may resolve itself into knowledge at some future day. The process of things upon this earth has been one of amelioration. It is a long way from the Iguanodon and his contemporaries to the president and members of the British Association. And whether we regard the improvement from the scientific or from the theological point of view, as the result of progressive development, or as the result of successive exhibitions of creative energy, neither view entitles us to assume that man's present faculties end the series—that the process of amelioration stops at him. A time may therefore come when this ultra-scientific region by which we are now enfolded may offer itself to terrestrial, it not to human investigation. Two thirds of the rays emitted by the sun fail to arouse in the eye the sense of vision. The rays exist, but the visual organ requisite for their translation into light does not exist. And so from this region of darkness and mystery which surrounds us, rays may now be darting which require but the development of the proper intellectual organs to translate them into knowledge, as far surpassing ours, as ours does that of the wallowing reptiles which once held possession of this planet. Meanwhile the mystery is not without its uses. It certainly may be made a power in the human soul; but it is a power which has feeling, not knowledge, for its base. It may be, and will be, and we hope is turned to account, both in steadying and strengthening the intellect, and in rescuing man from that littleness to which, in the struggle for existence or for precedence in the world, he is continually prone.

The Manufacture and Keeping of Cider.

The following extract from the "Wine-makers Manual," noticed in a previous number, will be of interest now that the season for cider-making is about to commence:

Cider is made by mashing and pressing ripe apples. A good eating apple is not necessarily a good cider apple, though there are good cider apples that are also good eating apples; for instance, the Romanites, russets, etc. The best cider apple is the crab apple. As stated, the juice is transferred to barrels as soon as pressed, and there permitted to ferment. The fermentation does not come as quick as in grapes, and proceeds generally a little slower. The saccharine matter showing but thirteen degrees, and often less, much less alcohol is generated, and acetous formation is much more likely.

Pure cider is a cooling, slightly alcoholic, tartish beverage. It may be much improved by using five to ten pounds of starch sugar to fifteen gallons of juice, or, if that be unobtainable, common sugar of the same weight, to each fifteen gallons of juice, before fermentation. The amount of sugar depends on the weight on the saccharometer. Cider that weighs thirteen, needs but five pounds; that which weighs nine or less, needs ten or more.

Boiling one barrel down to half, and mixing it with another barrel, thus making one and a half barrels of juice, is also a very good method, and boiling all down so as to bring the "must" to twenty and more degrees on the saccharometer, is also to be recommended; though I should think it handier for our households to condense one half to twenty-five, or even higher, density, and then pour it into the remainder. There are very few farms on which there may not be made six barrels of apple "must." By condensing three barrels into one, and pouring this condensed barrel of juice into the three other barrels of common cider, fermenting all in one cask, the farmer would secure four barrels, or one hundred

and sixty gallons of excellent house wine, which would keep the whole year in the darker and cooler parts of most of our cellars. Care should be had to sulphurize the vacant part of the cask out of which the cider is being drawn off for house use. Better still would it be to draw it off, late in the spring, into about seven hundred bottles (involving a cost of about forty dollars for bottles), after it is fermented and has become clear. The receipt for making sweet cider with sulphite of lime, can be had at the druggists.

Editorial Summary.

THE parade of the United Order of American Mechanics, took place at Lancaster, Pa., on the 11th inst., and was a large civic demonstration, and altogether a very interesting occasion. About fifty councils from this State were represented and several from Delaware and New Jersey. Upward of five thousand men were in line. Some twenty large wagons were also in line, on which carpenters, bricklayers, saddlers, coopers, carriage-makers, boiler makers, house carpenters, printers, blacksmiths, and tinsmiths plied their profession. On one wagon were thirteen young women, dressed in white to represent the original thirteen States. In the center of these was a young woman personating the Goddess of Liberty. The wagon was drawn by thirteen gray horses. This was followed by General Washington on horseback, accompanied by a footman. A miniature steam fire-engine, electric telegraph, sewing machines, grain drills, and grain fans were also represented.

DETECTION OF NITRO GLYCERIN.—To detect nitro glycerin in cases of poisoning, one should proceed in the following manner: The organic material to be tested is extracted with ether or chloroform, the extraction mixed on a watch glass with two or three drops of pure aniline, and evaporated upon the water bath. A few drops of concentrated sulphuric acid are then added, when, if nitro glycerin is present, a purple coloration appears which changes to a dark green on dilution with water. As little as .001 grain of nitro glycerin may thus be identified.

THE ASTRONOMERS IN LUCK.—Telegrams reporting the complete success of various expeditions sent to observe the recent total eclipse of the sun have been received. It is announced that the German expedition to Aden, in Arabia, is bringing six photographic views of the eclipse, while others announce the results of spectroscopic observations as being of the most remarkable character. We await with eagerness the full details of the observations.

WE regret to announce the total destruction by fire of the extensive billiard table manufactory of Phelan & Collender, situated on Thirty seventh street. There were employed in the building some four hundred and ten men, who will thus be thrown out of work. The loss is not known, but with the three hundred finished tables, and four hundred more in process of construction in the building, it cannot, with these alone, be less than \$175,000.

AUSTRALIA is beginning to look after her manufacturing interests. A paper mill has been started at Melbourne, and it is announced with something of an air of triumph, that it makes paper good enough to print on! A woolen factory lately constructed at Geelong, sold \$15,000 of goods at the first sale; and the citizens were so pleased at the result, that ninety of them ordered a suit of the native cloth, for their own wear.

A FEW days since, while some persons were walking upon the side of the bluffs in the rear of La Crosse, a singular subterranean sound was heard, which proved upon investigation, to proceed from a large underground stream of pure water running only three feet below the surface of the rocks. The stream is said to be ample for the supply of the city.

THE upper portion of the bottom land along the Missouri river is stated to be covered with the sunflower, the result of seeds scattered by the Mormon emigrants. Although these seeds are known to contain a valuable oil, no one has as yet taken advantage of this large natural crop, and it is annually wasted.

ENGLISH railroad companies may well be cautious in their management if such verdicts as the following are the rule. The family of a Mr. Howard, killed on the Great India Peninsula Railway, has been recently awarded damages amounting to \$58,750. How would such verdicts suit our American railway companies?

GRANT OF BOOKS FROM THE BRITISH GOVERNMENT.—In virtue of a grant from the British Government, Cornell University, Ithaca, N. Y., is to receive a complete set of the British Patent Office publications, consisting of more than 2,300 volumes, and also such books as shall hereafter be printed in continuation of the set.

S. W. BLOOM, of Bromstown, Ind., has made from common cornstalks, a sirup superior in flavor to sorghum, though there was a sorghum flavor discernible. The yield is nearly equal, per acre, to that of sorghum, and does not interfere with the production of green corn for market, from the same stalk.

It is reported that a new fire arm has been invented and exhibited at Königsburg, Prussia, having thirty-seven barrels. From 222 to 333 shots per minute can be made with it, and the balls carry 1,500 yards. It is used with a rest, and operated by one man, the recoil being taken up by a powerful spring.

AN organ is now being built in London for Christ Church Camberwell, which is to have its keyboard placed fifty feet away from the body of the instrument. Instead of wooden trackers conducting wires will be used, and the instrument will be played by electrical agency, in the same way as a telegraphic machine may be worked by an operator at a distance.

THE London *Lancet* says toothache can be cured by the following preparation of carbolic acid: To one drachm of colloid add two drachms of Calvert's carbolic acid. A gelatinous mass is precipitated, a small portion of which, inserted in the cavity of an aching tooth, invariably gives immediate relief.

It was proposed to give the Chinese an American watch, but as the Chinese day consists of only twelve hours, an ingenious Yankee has undertaken to manufacture a watch adapted to both the Chinese system and the one used in Europe and America.

A DETROIT editor has invented an advertising bell to be attached to bulletin boards, walls, fences, and so forth, to attract attention to the advertisements posted thereon. It is operated by a coiled spring with clockwork gearing, and when wound up and set running it will sound at intervals of a few seconds continuously for a week if desired.

A SENSATION was created at Niagara Falls recently. The main wires of the new suspension bridge have been thrown across the river. Two laborers walked the lower one from bank to bank, steadying themselves by the upper one, the wind meanwhile blowing furiously and swaying the wires in a frightful manner.

THE fires in the forests on the upper Ottawa, and Gotineau rivers in Canada are the most disastrous that have occurred on this continent, the loss being already estimated by millions of dollars. Some plan ought to be adopted to prevent the criminal carelessness in which such fires generally have their origin.

It is rumored that a movement is on foot to unite the United States, England, and Russia in a grand expedition to solve the problem of the North Pole and its surroundings. Something of the kind ought to be done, in order to freeze off a few more adventurers.

LOUIS NAPOLEON is said to be mindful of the interests of his old friends. One of these, a bankrupt in 1850, has by the Emperor's aid amassed \$20,000,000, while many others are said to have been placed on the track of large fortunes by his advice and assistance.

ANY one who proposes to advertise in a paper has a right to know its circulation. The mere printing of a notice is of no value unless somebody reads it. The SCIENTIFIC AMERICAN has more readers than any other journal of its class in existence.

It is said that Mr. Emerson considers the writing of twenty lines, completely finished and creditable to himself, a fair day's work. Some have thought that to read and understand twenty lines of his writings was a sufficient day's work for his readers.

THE proper height of turning tools on a lathe is a matter of importance to machinists. Many a job and many tools have been ruined by want of the knowledge in this respect gained only by experience.

It is said that velocipedes are to be adopted for the use of mail carriers in suburban districts, which it is estimated will enable them to complete their rounds four hours earlier and with less fatigue than is now the case.

THE Museum of the Academy of Sciences in Philadelphia is now receiving eight large meteoric stones, weighing together 3,000 lbs., discovered in the Mexican mountains by Dr. H. B. Butcher, of that city.

A SOUTHERNER proposes to supply the Boston market with paper stock made from the cane of the Florida cane brakes. He has invented a machine for reducing it to fiber which he affirms can be sold in Boston for two cents per pound.

TWISTING or turning of belts is a poor makeshift when a straight belt refuses from slackness to perform its office. Better take up the belt and allow it to perform its proper office.

A WATCHMAKER of Paris has just completed a watch for the Sultan, valued at one million francs. There is a diamond at the back nearly as large as a walnut.

JOHN JENNESS, of Craftsbury, has in his possession a pair of oak cartwheels, made during the Revolutionary war, still quite sound and capable of service.

THE circulation of the SCIENTIFIC AMERICAN was never greater than now. As an advertising medium it has no equal in its specialty.

THE early frosts experienced in New England call to mind the severe frosts that occurred in August, 1816, by which the corn crop was nearly destroyed.

A WESTERN editor has adopted the plan of sending to subscribers long in arrears very damp papers, as a gentle hint that there is much *due* on them.

It is said that an innkeeper at Schaffhausen, on the Rhine, has suspended in a frame a board bill which the Emperor Louis Napoleon has owed him for thirty-nine years.