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

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(Illustrated articles are marked with an asterisk,)

CAUTION.

It has become necessary for us to state very distinctly that the Scientific American Patent Agency Offices are at No 37 PARK Row, and not at No 39.

THE VALUE OF MECHANICAL SKILL IN THE ARTS.

Those who collect statistics of the world's material progress, and writers on cognate subjects, are fond of exhibiting and rehearsing the triumphs of machines over men—of mechanical contrivances over human skill. So much is attention attracted in this direction that we are apt to forget, in our admiration for the machine and its inventor, the skill of the mechanic whose delicacy and exactness of manipulation alone made it a success. We wonder that the machine can in its action so nearly approach the operations of the hand guided by the judgment, and almost venerate the intellect, which, by patient plodding or almost unexpected discovery, created it. But we do not so often wonder at the skill of hand, the correctness of eye, and the sensitiveness of touch by which the working mechanic elaborated the design of the inventor.

Mechanical skill is never a natural gift; it must be acquired by a long, persistent, and patient practice. There are those who much sooner get control of tools than others. Some can never, even by long practice, become close workmen; but generally the skill necessary to exact workmanship can be acquired, if the workman is not deterred by repeated failures and concentrates all his mental powerson the object sought. And the results are often surprising. The delicacy of touch in handling, forming, and adjusting the diminutive parts of a watch, for example, is almost miraculous. Lately, in reading a description of the Waltham, Mass., Watch Company's Works, we found a statement of the wonderful results of well-adjusted and delicate machinery which was almost incredible. It stated that perfect screws of steel, of such diminutive proportions that a microscope was necessary to see their form, are made by machinery. A pound weight required 300,000 of them, valued at from $3,000 to $3,500. But, we ask, how was the machinery built by which these screws were made? Simply by manual skill. In this same concern a workman had to make by hand the tool by which a tool was made, which latter tool became a portion of an automatic machine, and on this tool-creator he spent wearisome weeks of careful labor.

In fact all the astonishing results of automatic machinery are to be attributed to the hand skill of the workman. Is it any wonder that when we witness the performances of an intricate machine, as the card machine, for instance, we can hardly withhold the tribute of respect we pay to the exercise of human judgment? Human ingenuity, skill, brains, have been employed in its creation. Possibly a portion of that subtle essence called reason is in some way instilled into or imparted to the congeries of mechanical movements we call a machine. Indeed, are we not, as mechanics, in some sense machines? And yet for some purposes do we not create our equals—yes, even our superiors? But this is leading us into the regions of the metaphysical. We leave this to others, as not belonging to our province. We wish, mainly, to call the attention of mechanics to the importance of a practical knowledge of the skillful manipulation of tools, the necessity of patience in acquiring that skill, and the truth that the wonderful results of some of their productions, which may surprise even themselves, are simply and really the results of their own perfection in the use of tools, guided by their mechanical judgment.

It is true that a machine of steel, iron, brass, wood, and leather may produce results impossible to be imitated by hand, if rapidity, economy, and repeated exactness is required. Yet the machine which does this work is actually the product of manual skill as well as of inventive genius. And this manual skill—this education of the hand—is as valuable and necessary now as before machines, as technically considered, became common. In the age of chivalry, when the art of working metals was guarded as a secret, and the "cunning workmen" was the recipient of honors for his handiwork, everything like perfection in workmanship depended upon the judgment and handicraft of the workman. He had no machinery to reproduce copies of his work, but each successive result was from his own unaided and personal exertion. Such men are as valuable now as then. There is plenty of work to be done which no machine, however complex and ingenious, can compass; and the good workman is valuable, as is the inventor or the manager.

We witnessed an illustration of this fact, on a somewhat large scale, a few days ago, in a visit to the jewelry establishment of Carter, Howkins & Dodd, in Newark, N. J. The business of this establishment consists entirely in the manufacture of fine solid jewelry, gold, pearls, jet, coral, and enamel being the materials. They do not pretend to set gems, only to make gold jewelry. No article manufactured at this establishment is sham, filled, or of inferior material; and although the products of their work range from the plainest of plain gold rings to the most intricate chain work, hardly any portion of it is made by machinery. The main building is a perfect hive of industry; the workmen or workwomen sitting as closely together as the demands of their respective employments will serve, and from stage to stage producing most elaborately finished specimens of work.

Many people suppose that not only the sham jewelry known as "Attleboro jewelry"—from Attleboro, Mass., where the manufacture of false jewelry once was a principal resource of the town—but that good specimens also were made by machinery; "struck up" by means of dies acting on almost infinitesimally thin sheets, afterward to be "filled" with a baser metal to give them weight and solidity. This, however true it might have been a few years ago, is not now the case. Singularly enough as soon as gold went out of the community as a circulating medium of exchange, the people, satisfied before with imitations of its genuineness, demanded the reality, and now, we are told by Mr. Howkins, of the Newark firm, nothing suits the market but solid and genuine jewelry.

Some of the work, of course, must be done by machinery; as the rolling of the gold ingots into plates and the polishing of the finished work; but most of it is really and only hand work, depending for its exactness and nicety wholly upon the skill of the workman. Take the round jewelry so fashionable—pins, ear drops, studs, etc. They are first a disk of gold, cut from a sheet, to one edge of which is soldered a ring of similar sheet gold, making a flange. It is to be either chased or ornamented with enamel. The chasing is the work of the engraver, who must, by hand, cut every mark upon its surface; or if to be enameled, the pattern to receive the enamel is recessed into the gold by the graver, and then is sent to the filler who places the enamel in the recesses. This work, also is hand work. The enamel comes from Europe in masses resembling opaque glass, black, blue, or white, and is ground into a thin paste with water and laid into the spaces with a camel's hair brush by women. The article is then placed in a muffling furnace and subjected to a great heat which seats it firmly to the gold, the enamel acting, under heat, as a flux.

The settings of pearls, coral, and jet are also formed into shape by hand. and the material is set into these by hand. Even the watch chains we so much admire, the delicate threads of chains for suspending pin drops and handkerchief holders, and the network which forms the delicate bracelets sometimes seen, looking like ribbons of woven gold, are all formed, link, by link, by hand. These facts are hardly credible, yet it is so. Every link in a lady's watch chain or a gentleman's fob chain are separately formed, separately picked up and joined, and separately fused, welded, or soldered. The network of gold referred to as bracelets, so fine and close that light can barely be seen between their interstices, and so flexible as to equal the softest ribbons, are all made by hand, the links, not larger than grains of fine sand, being picked up, one by one, and interlocked with others until the work is completed. A cursory examination of one of these chains would convey the idea that they were woven as are ribbons of silk, and that the wire thread composing them was run through from end to end and across the fabric.

Machinery, however, cannot produce such work as we saw at this establishment. In this case as in many others the brain—intellect—is greater than brute or machine force. The human hand, guided by the human brain, is stronger, more subtile, and delicate than any machine made by man.

It is pleasant and somewhat gratifying to our pride as men to know that we still remain the "crown of all things," that we reign far above all of our creations; and for an exemplification of this grand fact we are indebted to our visit to the establishment of Carter, Howkins, & Dodd. In this connection it is only proper that we publicly tender our thanks to Mr. Wm. Howkins, one of the firm: for his suavity and kindness which enabled us to pass two hours so pleasantly in the inspection of the works, and gave us an opportunity to appreciate gentlemanly courtesy as well as to understand the superiority of men over machines.

THE TEREDO, OR SHIP WORM----IMPORTANT TRIAL.

A marine law case lately brought to trial before the Supreme Court, from the peculiar nature of a large part of the testimony, has attracted considerable public interest, particularly among ship owners and the marine insurance companies. The parties interested are well known shipping merchants of this city, and the action was brought for the recovery of heavy damages alleged to have been sustained by the plaintiffs in consequence of fraud and misrepresentation on the part of the defendant in the sale, in March, 1863, of a ship to the plaintiffs which two years after the purchase proved unseaworthy, her bottom having been badly eaten by worms. The point of interest in the case is the testimony elicited respecting the habits of the sea worm, and under what conditions this pest of the mercantile marine thrives. This evidence was introduced for the decision of the important question whether, provided the ship was as represented, the time elapsing between the sale and date when the vessel was docked for repairs was sufficient for the worm to have accomplished its work, the plaintiffs claiming that it was not, the defendants bringing the testimony of witnesses to show that the destruction could have been completed in a much shorter length of time while in the tropical and stormy seas.

The ship worm (*pholadidæ teredo*) called commonly by the latter and generic name, is an acephalous testaceous mollusk: the best known species, *teredo navalis*, attacks wood immersed in sea water, boring in the direction of the grain and swallowing the resulting dust. The borer of the teredo is admirably fitted by nature for the hard office it has to perform, being coated by a strong armor and provided with a mouth for piercing, like a leech. The rapidity and success of their boring varies with the different kinds of woods: fir and alder they eat with the greatest ease, but make much slower progress in oak, or the more bitter or solid woods.

The tropical waters are infested with these worms, and the warmer the climate the more dangerous and destructive they seem to be. From the tropical seas the teredo has been brought to the temperate waters of Europe and America, and has proved quite destructive, especially in Holland, where the dikes have several times given way, and great devastation has followed, as the result of its borings.

The worm at first is a very minute creature and leaves but a small opening on entering the wood: hence the interior of a plank may be almost entirely eaten away while preserving a fair and unbroken exterior. After entering the wood the worm increases rapidly in size, and though usually confining their operations to a single board, they never leave it until it has become completely honeycombed. Having once taken possession, they can only be removed by keeping the wood from the water for a length of time depending entirely upon the season, as they will immediately perish by frost, will live but a short time in hot dry weather, but are very tenacious of life in a damp state of the atmosphere.

By sailing into fresh water a ship may rid herself of these parasites in time, but the holes by which the worms entered are so minute that the salt water will be retained in the cells and fresh water will enter so slowly that the creatures will live and continue eating for some time after the vessel has left their natural element. Prevention, in this case, is certainly far better than cure, and if a new ship is properly sheathed, little danger need be apprehended from this source, as the copper acts not only as a preventive but also poisons the wood; the only possibility of exposure to their attacks being when, by careening, any portion of the vessel should fall below the water line, then on a long tack in the tropical seas, it is asserted, the teredo has been known to fasten itself to the vessel's side, and begin its destructive feast.

A WORD ABOUT ALMANACS.

With us of modern day, the almanac is valued as presenting in a convenient form the yearly calendar, a useful compilation of facts, or an annual of statistical knowledge of general import, and we can hardly realize the power exerted for ages by these productions of the old philomaths. To trace out the history of this class of popular literature would be an interesting but hopeless task, the origin and derivation of the name alike being lost in obscurity; the etymology of the word indicating an Arabic derivation and the very existence of the almanac being undoubtedly due to Mohammed on astrology. The offspring of ignorance and superstition, in its subsequent growth strangely combining truth and falsehood, assuming successively a religious, a merely astrological or a political character, its mischievous tendency at times so important as to be interdicted by royal decree, no other class of books reflects so well the tastes of the people for whose demand they were created.

Manuscript almanacs dating back to the fourteenth century are found in the old public libraries of Europe, carefully preserved marvels of fine workmanship and elaborate decoration, and it is not a little singular that the first page of each of the volumes now extant is invariably embellished with a portraiture of the human form, different portions of the body being divided off between the twelve celestial signs of the zodiac precisely as in the almanac of to day. The removal of this traditional cartoon has been attempted by the almanac wights at various times, but the result has always been pecuniary loss to the fastidious philomath, for the book wanting the "anatomy" was considered a dumb oracle and public opinion obstinately refused placing the least reliance upon its unsanctioned predictions.

Of late years it has become quite common for enterprising advertisers, particularly the venders of patent medicines, to make a medium of these periodicals, for gaining the public mind. But originality in this respect can not be pretended, for during the fifteenth and sixteenth centuries the physicians took the entire charge of these useful publications, and with a shrewd eye to business turned the power conferred upon them to a practical end, by nominating certain days for aperient and diuretic indulgence, together with others set aside for pharmaceutical abstinence; it is needless to add, that the former class held a striking predominance over the latter in annual comparison.

History preserves some memorable instances as showing what implicit reliance was placed upon the predictions of the crafty philomaths, even though repeatedly their wise announcements, owing to the unaccommodating nature of cir-