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JOSEPH GILLOTT.

The early history of the steel pen is curiously obscure. The most diligent search fails to discover the first maker or the earliest date of this implement. There were steel, or rather iron, pens—made, we believe, in Holland—as early as the middle of the seventeenth century. Towards the close of last century, Mr. Harrison, an ingenious Birmingham mechanic, made steel pens for Dr. Priestley. One of them is nothing more than a tube turned out of a flat strip of metal, with the sides and point filed away into the shape of a pen. The first actual supply of such pens, it is believed—the authority for the statement is no more than local tradition—was made by a Sheffield workman, whose name is forgotten. From time to time, as far back as 1809, steel pens, hand fashioned, turned and filed, were made as curiosities or luxuries for presents; but it was not until about 1824 that such instruments were produced in considerable quantities, as regular articles of manufacture. Mr. James Perry was the first manufacturer; but the process was tedious and costly. The metal was steel, rolled out of wire, and for this Mr. Perry paid as much as seven shillings a pound. To the first person he employed he gave five shillings for making each pen; and even when the trade had become regular he gave for some years as much as thirty-six shillings per gross to his workmen. Now—thanks to machinery and modern improvements—pens, not very good perhaps, but good enough to write with, can be made and sold at a profit for $3\frac{1}{2}$ cents per gross!

The first great impulse to the steel pen trade was given in 1820, when Joseph Gillott began pen-making; and since then his name has become so closely identified with the trade, and has acquired such a world-wide reputation, that he has come to be regarded as *the Pen Maker*.

Though so long resident in Birmingham, Mr. Joseph Gillott was not a Birmingham man by birth. He was born in Sheffield, on the 11th of October, 1799, the son of a workman in the cutlery trade. His own youth was occupied in this business, in which he was both industrious and skillful; indeed, according to the account of old workmen, he was a noted hand at the forging and grinding of knife blades. In 1821, when Mr. Gillott was in his twenty-second year, trade in Sheffield fell off, and work being scarce, the young workman resolved to transfer himself to Birmingham, where, owing to the variety of occupations, a skilled mechanic need never be idle.

His earlier employment in Birmingham was in the light steel toy trade—the technical name for the manufacture of steel buckles, chains, and other works and ornaments of that kind. Some specimens of his workmanship in this trade Mr. Gillott always preserved.

After being for a few years engaged in this trade, Mr. Gillott began the manufacture of steel pens. His faculties of invention and adaptation at once came into play. Such pens as were then made were laboriously cut with shears out of the steel, and were trimmed and fashioned with the file in imitation of the quill. Mr. Gillott adapted the press to the making of pens—the stamping press, then much used in the Birmingham trades, and now familiar to everybody who has ever been in the shop of a metal worker. He saw that the press would enable him to dispense with most of the

slow and laborious operations of pen-making; that it would cut out the blanks, slit them, bend the metal, stamp the maker's name, and thus, by mechanical means, render production at once rapid and certain. But the conception of this idea and the means of working it out were different matters. The metal had to be prepared by rolling, pickling, and tempering for the action of the press. Then special dies had to be made for each size of pen, and for each operation of stamping to which the blanks had to be submitted. Presses of improved construction—quick, light, easily worked, and yet firm enough to strike a sharp, heavy blow—had to be made. And when these difficulties were overcome, there

in this respect, to an equality with "the gray goose quill." It is, however, a curious fact—and one worth noting, if only as evidence of character—that Mr. Gillott himself never used a steel pen; he always wrote with the quill. For some years Mr. Gillott kept his methods of working secret, fashioning his pens with his own hands, assisted by a workwoman whom he afterwards pensioned; and many curious anecdotes of the early days of pen-making have been related by this old lady. She used, for example, to tell with great amusement how the first pens were blued in a frying pan over a garret fire. This was at the period when the pens were sold singly, at high prices. Even after the manufacture had been

for some time established, the price kept up. Mr. Gillott has been heard to say that on his wedding day he made seven pounds and four shillings by producing a gross of pens, which he sold at a shilling each.

In 1872, Mr. Gillott employed about 450 persons, the manufacture of pens reached more than five tons per week, and the prices were reduced from one shilling each to a few pence per gross—all the work of the active brain and skillful hand of one industrious and able man.

Every visitor to Birmingham very properly holds that a visit to these works is both a duty and a pleasure. The courtesy of the attendants, the interest of the processes, the cleanly, orderly industry of the various rooms, the wonderful and delicate skill of the slender fingers, and the ready hands, the millions of the little peaceful weapons fashioned for all parts of the globe, are a marvelous tribute to the genius, perseverance, and liberality of one of the most famous heroes of the arts of peace. All readers will be glad to know that Mr. Gillott's eldest son inherits his father's mechanical genius and generous spirit, and that the world-famous works are not likely to be closed to the public eyes.

It is not only, however, as a pen maker that Mr. Gillott deserves to be remembered. This record would be incomplete without mention of his great collection of pictures. The taste for art was developed early in life. So soon as he had money to spare, Mr. Gillott began to buy pictures. Apart from business, this was the work of his life; the collection constantly grew, both in quality and extent, until at last his house in the Westbourne Road, Edgbaston, and his residence at

Stanmore, near London, were crowded with works of Turner, Stanfield, John Linnell, Collins, Muller, MacIise, Leslie, Mulready, Cox, Eastlake, Callcott, Webster, Wilkie, David Roberts, Frith, Hook, Poole, William Hunt, Faed, Nicol, Copley Fielding, Prout, and almost every English artist of note.

The sale of his collection—a lamentable dispersion of art treasures—is too recent to be forgotten by our readers. The enormous produce of the sale, \$850,000, affords proof that art not only yields the highest pleasures, but pays in a commercial sense, for Mr. Gillott's pictures brought, in all cases, a large profit upon their purchased price.

Mr. Gillott's figure was short, sturdy, square; his hair and beard (for many years before his death) silvery and venerable; his forehead broad, well rounded, high; his eyes clear, humorous, and bright; his expression pleasant and as



JOSEPH GILLOTT, INVENTOR OF THE STEEL-PEN PRESS.

remained others not less formidable, such as tempering the metal after it had left the press, rendering the newly made pens flexible so as to write easily, cleaning and polishing them without injuring their fineness, and coating them with some kind of varnish, so as to render them attractive to the eye. This was the work which Mr. Gillott had to do; and with much ingenuity and unflagging perseverance he accomplished it.

One of the chief troubles was the extreme hardness of steel pens; when much used, they became pins rather than pens. After many trials Mr. Gillott effected a great and permanent improvement by cutting the side slits in addition to the center slit, which had been solely in use up to that period. To this was afterwards added the cross grinding of the points; and these two processes perfectly succeeded in imparting elasticity to the steel pen, and bringing it up, in

uring; his walk light, active, and firm. His chief characteristics were remarkable quickness and accuracy of observation, wonderful shrewdness, common sense, and frankness; boldness, decision, and enterprise; rare mechanical skill and constructive powers; special talent for arrangement and organization, and rapid and sound judgment on all matters that came before him.

We are indebted to the *Practical Magazine* for the admirable portrait of this remarkable man.

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SECRET SOCIETIES AMONG COLLEGE STUDENTS.

Mortimer M. Leggett, the youngest son of the Commissioner of Patents and a student at Cornell University, was recently accidentally killed during the progress of his so-called initiation into the "mysteries" of a college secret society known as the *Kappa-Alpha*. The circumstances were that the deceased went with a party of members of the above fraternity to a creek just outside the town of Ithaca; and there, blindfolded, he was left, with two companions, standing on the brink of a gorge through which the stream runs. Shortly after, a crashing of bushes, followed by groans, was heard, when the remainder of the party, hastening to the spot, found that the three boys had fallen over a precipice some fifty feet in height. Young Leggett, it seems struck on his head, sustaining such severe injuries that death ensued in half an hour, while the others were both seriously hurt.

As one of these college fraternities has thus been the indirect means of causing this terrible calamity, we desire just here to express our opinion on the system of secret societies as generally practiced in our institutions of learning. These associations are bodies of students, organized in principle something after the orders of free-masonry or odd-fellowship. In many, the members are numbered by hundreds, and chapters of a single society often exist in a score of colleges at once. The records are handed down from class to class; and out of each set of freshmen, a few individuals are selected for the privilege of membership. When the plan was started (during, we believe, the year 1827) the idea was simply to form clubs of young men, for mutual improvement in debate and such kindred studies as are better pursued by numbers than by single persons, and to keep alive, among *alumni*, pleasant associations of college life. In course of time, the former innocent and laudable object has been lost sight of, or rather relegated to other associations, now existing in many colleges and not included in the list of secret societies; while the cardinal principle of the younger chapters of the latter organizations seems to be nothing more nor less than simple mischief, rendered attractive by a little mystery and concealed under the cloak of such cognomens (symbolized by Greek letters) as "union of souls," "circle of stars," "lovers of wisdom," etc. If the boyish nonsense resulted in the usual students' pranks, it might be passed over with a smile; but such is not the case. The influence exerted, upon boys fresh from school and for the first time free from direct home influence, we believe (from repeated instances within our personal knowledge, and in connection with one of the oldest colleges in this country) to be in a high degree baneful and demoralizing. Unless a youth has well filled pockets, (in which case rival societies vie with each other to see who shall secure him, or rather his money) he is not invited to membership at all. Once joined, however, and held by working upon his fears through the blasphemous oaths of secrecy that he is forced to take, he is inducted, by sheer force of example, through a routine of profanity, intemperance and gambling; while in many cases, if young and innocent, his course leads to graver faults, committed more through a sense of shame and false pride than depravity, and due to the tacit if not open instigation of his unscrupulous elders,

The sad and untimely fate of Mr. Leggett, just at the outset of doubtless a brilliant and honorable career in the calling which his father has so ably adorned, will, from the circumstances under which it occurred, excite a lively and widespread sympathy. It is the first death, which, to our knowledge, has been owing, though indirectly, to the proceedings of these student organizations; though we have heard of numerous cases of maiming and injury thus caused, and of idiocy and cerebral disease due to the effect of hideous and ghastly paraphernalia upon the imagination of weak minded boys.

There is a notion, which is becoming entirely too prevalent, that colleges are merely convenient places for sending young men to while they are passing through that uncertain and troublesome age, leading to manhood, during which they are expected to sow their traditional wild oats. To this idea, we believe, may be mainly ascribed the barbarities of "hazing," and the no less reprehensible practices of secret societies; while to it also may be traced many of the complaints that our seminaries are inferior in an educational point of view to those of foreign countries. Hazing, already crushed out in the government naval and military schools, is exciting so large a share of public condemnation that there is a fair prospect of its stern repression in colleges generally. The secret societies, we trust, may meet hereafter with similar treatment, at least through the influence of parents if not at the hands of faculties. Harvard forbids their existence among her students, and Cornell at this time would do well to follow her example.

PROGRESS OF PATENTS.

The following were the number of applications for patents made to the principal governments of the world in the year 1872, as given in the published statistics of the British Patent Office:

	Number of Patents Applied for in 1872.
United States.....	18,243
France.....	4,872
Great Britain.....	3,970
Belgium.....	1,921
Austria.....	922
Canada.....	671
Italy.....	521
Saxony.....	259
Sweden and Norway.....	200
Bavaria.....	164
Wurtemberg.....	141
Baden.....	113
British India.....	71
Victoria.....	60
Prussia.....	56
New South Wales.....	42
British Guiana (allowed).....	28
Cape of Good Hope, from 1860 to 1869.....	18
New Zealand.....	18
Mauritius.....	11
Ceylon.....	5
Tasmania.....	5
Jamaica.....	4

The aggregate number of patents applied for in all of the countries above named, in 1872, except the United States, was 14,072, thus showing that in this country the number of patents annually applied for exceeds, by 4,171, the combined number applied for in all other countries above named. The reason for the surprising difference in favor of this country, in the inventive productions of the world, we believe to be due to the superior theory which prevails here concerning the object and uses of patents. We grant patents for the purpose of encouraging the useful arts. We regard the inventor as a benefactor, and place him under no restrictions in the sale or working of his improvement. We grant patents at so low a price that the masses, the poorer classes, among whom the best inventors are found, may readily obtain and hold them.

WOOD AND STRAW PAPER MAKING IN FRANCE.

The improved processes of making paper from wood, straw, and various grasses, as practiced in France now enables the manufacturers to recover 85 per cent of the caustic alkali, used in the reduction of the raw material into pulp. This is a very important economy.

In order to convert wood into pulp, a strong solution of the alkali is necessary. One pound of carbonate of soda is required to produce four pounds of pulp.

By steeping the wood or straw in the alkali solution, the resinous and other gummy matters are separated from the fibers of the material, and become mixed with the solution. To regain the soda for re-use is now the object of the manufacturer. This is done by evaporating the water by heat, then charring the resulting mass, which yields carbonate of soda, then converting the latter into caustic soda.

The evaporation is effected by passing the product of combustion from the fire which heats the alkaline solution through the liquid which is to be evaporated. For this purpose the liquid is thrown up in the form of a thin spray, by paddle wheels. 12½ pounds of the solution, it is stated, are evaporated for each pound of coal consumed. The carbonate of soda is then subjected to long continued washing in a peculiar apparatus until it is fit for burning, and at last 85 per cent of the original quantity of the alkali is recovered. The former methods only permitted the recovery of from 50 to 60 per cent of the alkali.

TWO INTERESTING DISCOVERIES.

The *America*, a daily journal of Bogota, in a recent issue publishes a letter of Don Joaquin Alvez da Costa, in which he states that his slaves, while working upon the plantation of Porto Alto, Paralyba district, Peru, have discovered a monumental stone, erected by a small colony of Phoenicians who had wandered thither from their native country in the ninth or tenth year in the reign of Hiram, a monarch con-

temporary with Solomon and who flourished about ten centuries before the Christian era. The monolith bears an inscription of eight lines, written in clear Phoenician characters, without punctuation marks or any visible separation of the words. This has been imperfectly deciphered, but enough has been made out to learn that a party of Canaanites left the port of Aziongaher (Boy-Akaba) and navigated about the coast of Egypt for twelve moons (one year), but were drawn by currents off their course and eventually carried to the present site of Guayaquil, Peru. The stone gives the names of these unfortunate travellers, both male and female, and probably further investigations will shed more light on the records they have left.

Another and more astonishing discovery, we find announced in *Les Mondes*. It appears that some Russian colonists, having penetrated into hitherto unexplored parts of Siberia, have found three living mastodons, identical with those heretofore dug up in that country from frozen sand. No particulars are given as to this, we fear, somewhat questionable find. From the statements of M. Dupont, of the Brussels Royal Academy, it would seem that, like the reindeer, the mastodon should not now be extinct, and that the animal is naturally the contemporary of the horse, sheep and pig. Hence the announcement is not without some shadow of probability.

NEW ORDER BY THE COMMISSIONER OF PATENTS.

The subjoined order, recently issued by the Commissioner of Patents, will be fully appreciated by inventors and their representatives, exhibiting, as it does, a determination at headquarters that the chronic indolence heretofore prevailing among certain examiners, shall no longer be tolerated.

U. S. PATENT OFFICE, Washington, D. C., October 3, 1873

I have noticed, for more than two years past, that a few of the Examiners are generally from one to two months behind with the work in their rooms. The fact that they so uniformly have about the same number of cases on hand is evidence to me that, with proper effort, they might keep their work closely up to date. The answering of letters and the making of excuses, in consequence of being so far behind, are causes of great loss of time. I shall expect the work of the Office to be promptly up to date by the tenth day of November. If, to do this, it becomes necessary for Examiners to demand of their subordinates more than six hours labor per day, they will do so; but the work must be brought up to that date, and thereafter kept up.

(Signed) M. D. LEGGETT, Commissioner of Patents

The tedious delays in the matter of official decisions often deter inventors from applying for patents, and are equally discouraging to those having cases pending in the Patent Office. With this rule inflexibly observed, early examination and quick disposal of cases will be insured, thereby largely increasing the business of the Office.

PETROLEUM AND PINE TAR GASES.

Some time ago, it may be remembered, we called attention to the interesting and novel experiments, made by Professor Benevides of Lisbon, Portugal, upon the flame of compressed carbonized gas burning in free air. Ordinary illuminating gas and marsh gas (light carburetted hydrogen) were the subjects of the investigation. Recently the same author has conducted similar inquiries, in reference to gas extracted from the residues of petroleum and of the pine and fir tree, with even more remarkable results.

The gas derived from vegetable sources, used in the experiments, was obtained by the distillation of the residue left after the distillation of the roots, by employing a jet of steam at high tension, which was injected into the distilling cylinders. A liquid was produced from which turpentine was extracted, when there remained a black and thick fluid as residue. The latter, submitted to distillation, disengaged a combustible gas which for some time past has been employed for illuminating several light-houses on the coast of Portugal. The petroleum gas was obtained by the distillation of the residuum of petroleum by the Hirschel system. The gases, thus arising, as well as those derived from the pine, are mixtures rich in hydrocarbons, a phenomenon analogous to that observed with ordinary illuminating gas obtained by the distillation of coal, and contain, in variable proportions, protocarburet of hydrogen, bicarburet of hydrogen, carbonic oxide, carbonic and sulphydric acids, etc.

Coal gas possesses in general much of the protocarburet and little of the bicarburet. As the proportions of these gases are variable, the density and illuminating power of the mixture likewise vary considerably. The coal gas, as employed in the city of Lisbon and used in the course of the experiments, has a density of 0.4, and its illuminating power, as indicated by the Erdmann apparatus, is 29.

Pine gas has a very pronounced odor resembling that of burned turpentine: its density is 0.8, nearly double that of coal gas. It is a mixture very rich in carbon and requires burners of special construction with very small orifices, in order to avoid the production of smoke and bad odor, as happens when consuming the gas in the ordinary illuminating gas burner.

The air which combines with the flame in the latter case is insufficient to ensure the combustion of the enormous quantity of carbon contained. The illuminating power of this pure gas is much superior to that of coal gas. In experiments with the apparatus above named, while the latter gas gave 29, the former produced an indication as more than 50. The graduation of the instrument stopping at this point (the maximum width of the slit), it was found impossible to cause the brightness of the pure gas flame to disappear entirely, so that the full intensity of its illuminating power could not be