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CANADIAN MECHANICS MAGAZINE AND PATENT OFFICE RECORD

Vol. 4. OCTOBER, 1876. No. 10.

THE PRIDE OF IGNORANCE.

THERE are many kinds of pride that inflate the human breast, and which may be ranged into two classes—noble pride, and ignoble pride. Of the latter none is more despicable, or more detrimental to the progress of science, and the advancement of the human race, than the upstart pride of ignorance.

The Engineer, who by his talent and genius has overcome almost insuperable difficulties in the construction of his works, such as bridging over some wide and rapid river, or tunnelling through miles of rock and quicksand, under mountains, and under rivers, or cutting a canal through a desert of shifting sand, may be properly proud of the success of his work, and of the genius with which Providence has endowed him. The Architect, who, after overcoming the difficulties of an imperfect foundation, raises securely thereupon a massy edifice of beautiful proportions and chaste design, may well feel proud of the admiration bestowed upon the work of his genius. The Mechanic, who works out the details of the ponderous engine, which a child can almost govern; or produces with his skilled hand the most delicate automatic machinery, which even requires the aid of a microscope to examine its actions, may well be proud of his skill and handicraft. The artist, the sculptor, the philosopher, the physician, and all who labor with love to excel to the utmost in their arts or professions, may also feel proud of the success that has followed their efforts; for theirs is indeed a noble pride. Such men have made their professions the study and laudable pride of their lives.

But there is another class of men, who, neither gifted with genius, talent, education or modesty, put themselves forward in public places as critics, or office-seekers; they plume themselves upon a knowledge they do not possess, they assume airs of superiority at public meetings, and impose upon the world by unblushing effrontery, which passes for experience; and a smattering of high sounding technical terms, which passes for scientific attainments; they possess a certain flippancy of speech that passes for smartness, and, too often, are placed in positions of responsibility and trust, to the detriment of the country and loss to the public. These men fancy they are clever, and are proud in their ignorance. The unmerited position to which they suddenly find themselves elevated instead of abashing, only serves to puff up their pride to a greater extent, until they really believe they possess the talent and acquirements of highly educated and professional men, and in their self-sufficient appreciation of their abilities obstruct the public service, and, frequently, endeavour to carry out themselves their own crude and impracticable ideas. They are tyrannical in their power, proud in their vanity, proud of their self-supposed ability and knowledge, and this is that ignoble pride which we class as the pride of ignorance.

This class, unfortunately, is very numerous, and we fear is in the ascendant. They find their way into our corporations, they become members of committees and associations, and have a finger in the pie in all business where busy bodies and talkative people have greater weight with the mass than true merit and experience. They are sure to meddle with matters of which they know little or nothing practically. They steal ideas from their clever subordinates and pass them off in committee rooms as their own genuine inspirations, and they glean up what little knowledge they possess, like grain that falls from the reaper's hand, but instead of binding it up in sheaves ready for the barn or the thrashing mill, they tie it all up promiscuously, heads and tails together, a disordered and entangled mass. Such people are the horror and incubus of all men of science. They mutilate their designs until almost unrecognizable; they take from their works their strength, purity and beauty, under the plea of economy; and substitute weakness, and meretricious ornaments of their own selecting, and this they call retrenchement and improvement.

When will the public be able to judge between the grain and the chaff? When will they cease to be imposed upon by these seekers after public pap; seekers after the

"bubble of reputation" out of the public purse. We have only to look around in this very city, and see before us, in standing mimicry, the result of placing such men in positions of responsibility and trust. Although we fall far short of the evils which have arisen in the sister city, we are fast verging toward it, and it is high time we were putting the right men in the right place, to see that the enormous sums annually spent in Montreal are spent judiciously and honestly.

The ancient capital of this province is now suffering from the effect of placing power in the hands of mere pretenders to knowledge. Her public works have cost treble what they should have done, and they are still imperfect in every way. Her treasury is depleted—her mercantile supremacy has been lost—and all owing to placing the reins of power in the hands of presumptive pretenders to knowledge, men too ignorant to learn better because, paradoxical as it may appear, they "know too much," and revel in the *pride of ignorance.*

GRAINING STENCILS.

(See page 301.)

Although we do not recommend the practice of using machines for graining, and believe them particularly objectionable to be used by young men learning their trade, still they are exceedingly serviceable for many kinds of graining where a mere repetition of pattern is of no consequence, and where despatch is a matter of far more consequence than variety. Very few grainers can produce a piece of good work, if it has to be done hurriedly; in fact good grainers decidedly object to perform their work in an inferior manner. Such work therefore, that has to be done with great rapidity, and at a cheap rate, is generally performed by men who know not how to grain, and whose work and coloring is but a caricature of the grain of wood they profess to imitate. To such men a good graining machine is of the utmost advantage.

On page 301, we give an illustration of Callow's improved machine for quick and easy graining, by cloth combing, or wiping out the work through FLEXIBLE PERFORATED METALLIC PLATES, having corrugated surfaces that improve the work and protect the wet colour from being blurred or soiled. The pattern can be changed by sliding the plate in a backward, forward or curved direction, which alters the pattern in the plate, so that different designs can be produced at each and every motion of the plate.

A set of sample plates have been left at this office for the inspection of those requiring further information.

PORTABLE ENGINE.—PHILADELPHIA EXHIBITION.

(See page 293.)

The Ames Ironworks contribute a number of portable and semi-portable engines. In the former the water space is carried under the grate, and the smoke-box is a direct continuation of the boiler (which is lagged), and the furnace front can be readily removed. The engine is on a bed-plate, and can be removed from the boiler and used as a stationary engine, and is fitted with a governor made by the firm; the heater is formed in the bed-plate; a hand-pump is fixed to the larger engines to fill the boiler when the engine is not running. On the next page will be found a table giving the principal dimensions of the engines made by this firm.

DEFECTIVE SIGHT.—Those spots which appear to float before our eyes are the so-called muscæ volitantes, and are in many cases a consequent on debility. When we regain our former health they become less troublesome and finally disappear.

CANADIAN ANTIQUITIES.

(See page 296.)

This is the second article on Canadian Antiquities which we have received from the pen of Charles Walkem, Esq., of Ottawa, formerly of the Civil Staff, Royal Engineer Department, and which it affords us much pleasure to record in the columns of the CANADIAN MECHANIC'S MAGAZINE, where it will be bound in a volume of that work and placed on the shelves of the Library of Parliament, and in the Institutes of the Dominion, thus securing, for all time, we hope, a record of those very interesting relics of the early history of our country, which are fast crumbling away under the wasting influence of time, as well, too, by Goths and Vandals, who obliterate everything of a national interest (in this money-making age) to lucre, and leave not a remnant of romance or interest connected with the stirring time when the white man first landed on our soil and fought his way to the conquest of this magnificent continent. We cannot realize, in the present centennial, the value of such records of past days; but when the red man shall have disappeared from the face of the earth, and grey old time shall have tinged the early history of Canada with the attractive hues of romance, and a greater taste for literature has diffused itself among our people, many then will appreciate the forethought of Mr. Walkem, in placing on record the valuable information he has in his possession. We trust he will continue to supply us with copies of all the valuable statistics and sketches he may still possess.

QUEBEC.—RUINS OF INTENDANT'S PALACE.

"It is the voice of years that are gone! they roll before me all their deeds!"—OSSIAN.

"Here desolation holds her dreary court."—BYRON.

One of the most prominent incidents connected with the celebration of the "Centenary fête" at Quebec, on the 29th December, 1875, under the auspices of the Literary and Historical Society of that time-honored old city, was the military occupation of the Intendant's Palace, in St. Roch's Suburbs, by the American insurgent force under the leadership of the notorious Benedict Arnold, and its subsequent destruction by the guns from the ramparts under orders of the Governor General, Sir Guy Carleton.

Neither the general description of the old building in the centenary pamphlet, the photograph of its ruins, as the fantastic sketches and views before its destruction by authors and artists, convey any adequate idea of its real extent and capacity in length, breadth or height.

My present object, therefore, with your permission, is to supply these deficiencies through the medium of your excellent MAGAZINE from an original plan and elevation of "*le vieux Palais*" (the old Palace) drawn to a scale of twenty feet to an inch for military purposes, about the year 1770, or five years before its destruction in 1775. And more especially do I feel it a duty to submit this plan for publication, since it has become a part of the military history, not of Quebec only, but of Canada.

The following is an extract from the centenary pamphlet:

"This once magnificent pile was constructed under the "French King's directions and the means supplied by his "munificence, in 1684, under Intendant DeMeulles. It was "burnt in *1712?* when occupied by Intendant Bégon, and restored by the French Government. It became from 1747 to "1759, the luxurious resort of Intendant Bigot and his wassailers. Under English rule it was neglected,* and Arnold's "riflemen having from the cupola annoyed Guy Carleton's "soldiers, orders were given to destroy it with the city guns."

"Skulking riflemen in St. Roch's watching behind walls to "kill our sentries. Some of them fired from the cupola of the "Intendant's Palace. We brought a nine-pounder to answer "them." (Extract of journal of an officer of the Quebec Garrison, 1775.)

* This is very questionable, as the plan and elevation of the building here submitted were made for general repairs and military accommodation.

For those readers who may not be familiar with the term "Intendant" or "Intendant's Palace," and the character or the duties appertaining to that dignified office, the following remarks are with much deference submitted on that head from historical and reliable sources. His duties combined those of administration, direction, management, superintendence, &c., and next to that of Governor General, the office of Intendant was looked upon as one of the greatest importance and celebrity in Quebec. It was first established by the proclamation of the French King, Louis the XIV., in 1663, thereby creating a Supreme or Sovereign Council (*Conseil Supérieur*), for the affairs of the Colony, composed of the Governor General, the Bishop, the Intendant and four Councillors, with an Attorney General and Chief Clerk. The number of Councillors was afterwards increased to twelve. The authority of the Intendant, except in matters purely executive, was, indeed, little inferior to that of the Governor himself.

He had the superintendence of four departments, viz., of justice, police, finance and marine. The first Intendant named under the proclamation of 1663 was M. Robert, who, however, never came to Canada to assume the duties of his appointment, and it was not till the summer of 1665 that Jean de Talon, the first *bona fide* Intendant, arrived at Quebec, with the viceroy, Marquis de Tracy, and the famous Regiment of Carignan. From the examination of old plans and information afforded by l'Abbé Tanguay, of the Census Department, it would appear the Sovereign Council first held their meetings in a very modest building standing on the south side of Fabrique street, a little to the west of the Jesuit College, known at that time as the "*Treasury.*"

During the incumbency, or official career, of the fourth Intendant M. de Meulles, in 1684, that gentleman endowed at his own expense, the eastern portion of the St. Roch's Suburbs with an edifice known as "*le Paluis*" (the Intendant's Palace), remarkable for its magnificence, extent and general appearance. The endowment also included, as shown upon old plans, about ten acres of land contained between the alignments of St. Rochs and St. Nicholas streets, to the River St. Charles in front, and in rear by the cliff, on the present line of St. Valier street. This ground was laid out and embellished in walks and ornamental gardens, &c.

In 1712, M. Bégon, the eighth Intendant, arrived at Quebec, with a splendid equipage and retinue from France, taking up his abode in "*le Palais,*" which unfortunately on the *5th January following, 1713*, was destroyed by fire, and such was the rapidity of the flames that the Intendant and his wife barely escaped with their lives. Madame Bégon was obliged to break the panes of glass in her apartment before she had power to breathe. Two young ladies, her attendants, perished in the flames. The Intendant's *valet* anxious to save some of his master's wardrobe, also perished in the flames. His secretary running barefooted for his life towards the river in front, was so badly frozen, that he died a few days afterwards in the hospital of the Hotel-Dieu.*

The Palace was afterwards rebuilt at the expense of His Majesty, under the direction of M. Bégon, whether in the same style and character of the first structure has not to my knowledge been ascertained. There can be no doubt but the plan and elevation of *le vieux Palais*, now presented, are a faithful illustration of that restored, or rebuilt, under M. Bégon, and destroyed in 1775. The exterior entrance appears to have been from that side, next the cliff, under the "*Arsenal,*" on the present line of St. Valier street, flanked on either side by the King's stores, magazines, &c., and behind that stood a large building known as the "*Prison.*"

If as described by *La Potherie*, in 1698, the former building and accessories resembled a little town in itself, the remark would seem equally to apply, and perhaps with still greater force, to the group put up after the fire of 1713, as no less than about twenty in number (some of large capacity) are shewn on some of the old plans made before and after the surrender of Quebec in 1759. According to perspective drawings by a naval artist, an officer of the fleet accompanying Wolfe's expedition, and published in London 1761, of and from other sources, especially in the *original* of the plan now presented, there remains little doubt for want accommodation elsewhere; but the Old Palace was occupied by the troops of the garrison under General Murray, and continued to be used as barracks for officers and men until its destruction by the guns from the ramparts in 1775. This assumption is strengthened if not confirmed by the occupation of the Jesuit College as barracks immediately afterwards in 1776. The extent of accommodation for troops in the one building, would be nearly equal to that in the other, viz., about a regiment hence, the comfortable quarters in *le Palais* taken up by the insurgent force under Benedict Arnold, which would accommodate the whole of his men.

In its general aspect this once celebrated structure was more imposing from its great extent than from any claim to ornate embellishments or architectural design. The style appears to be the French domestic of that period, two clear stories in height and a basement. The extreme length of frontage is 260 feet, with projecting wings of 20 feet at either end (*vide* plan); the breadth from the front of wings to the rear line is 75 feet, and the central part 58 feet. The entire height of the façade, from the ground line to the apex of roof, is about 55 feet, and from the same to the eaves line about 33 feet. In the basement there were no less than 9 vaults, 10 feet high to the crown of the arch, along the whole front as shewn on the plan. The appartments in the two stories, it will be seen, are divided longitudinally by a wall from one end of the building to the other, consisting altogether of about 40 in number, out of which, according to the original drawing, 25 are numbered as barrack-rooms for the occupation of troops.

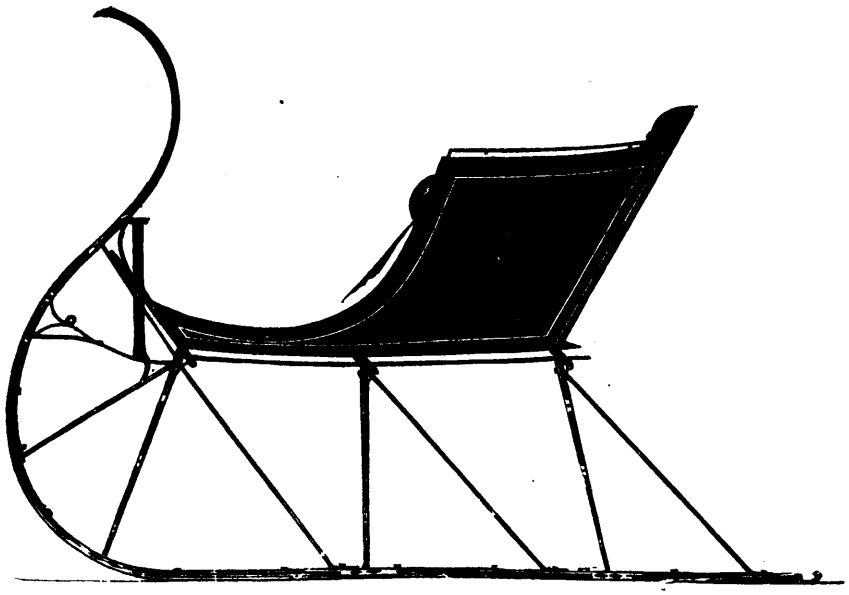
The entire roof is plain and steep, and only broken by the pedimented wings at either end of the building, with chimney stacks and stone coping over the transverse fire-walls and further relieved in the centre by a graceful octagonal cupola of two sections and a tapering spire. The approach in front is by two flights of steps through a porch forming a conspicuous feature to the main entrance. The arched windows of the basement rise considerably above the site level, adding beauty to the front. The walls of the whole structure were substantially built of the black slate rock peculiar to Quebec, always subject, however, to more or less decay, when exposed either to the action of extreme heat, or the severity of a Canadian climate, as shown to some extent in the present case, but only to some extent, judging from the tenacity and hardness of the material still remaining. It is quite evident, in accordance with the practice of those days, that much time and labour, even to tediousness were bestowed in the erection of these walls, specimens of which are still in existence elsewhere. The process was to build in *dry masonry* a few feet at a time, generally about two feet, then grouted with a thin semifluid mortar composed of quick lime and fine sand poured into the interstices of the stone work, filling every cavity, excluding the air, and left to dry before commencing the next course. Some of the drest stone at the quoins and angles appear to have been brought from *Pointe-aux-Trembles*, and some, probably, from the limestone quarries at Beauport. The window and door jambs were faced with a peculiar hard species of brick only *one and a half inches* in thickness, of a dark flinty texture, combining in large proportions silica and oxide of iron, and nothing the worse in appearance for the wear and tear of nearly two hundred years. These in size and quality very much resemble *Flemish bricks* and must have been imported directly from France.

The large store houses fronting the cliff were undoubtedly built in the same compact manner as the walls of "*le Palais.*" Mr. Boswell some years since in excavating the foundation of his brewery on the site of these "store houses," encountered some of the old walls, and found them so hard that powder had to be used for blasting. The mortar was harder than concrete or stone itself, and a drill had but little effect in boring it. Portions of these old walls and vaults in the brewery are still in good preservation. Mr. Boswell for many years past has been the lessee of the War Department for the site of "*le Palais*" ruins, &c.; he has had them covered in several times with a temporary roof and improved the premises generally at his own expense. There was an old story current for many years of the existence of *very deep* and extensive vaults underneath these old buildings, and subterranean passages, the one leading to the river northward and the other in an opposite direction to the Upper Town. It is highly probable that the remains of the old vaults and passages found in the excavations for the brewery have been the origin of this story. In the one case such a passage towards ths river would be flooded at high water, and in the other obstructed by a rampart of solid rock.

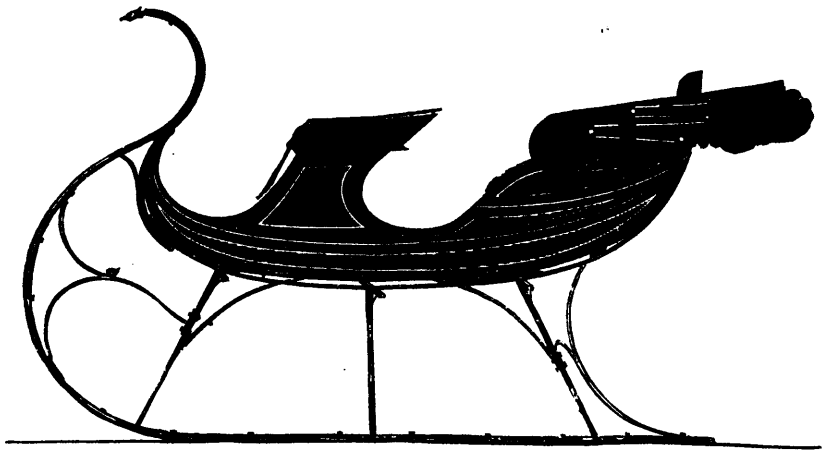
For nearly a hundred years from its destruction in 1775 the remains of *le Vieux Palais*—land and premises known as the "King's Wood Yard." would seem to have been in the continued occupation of the military authorities. The extent of land during this time was much reduced by the sale of building lots on the lines of St. Valier and St. Nicholas streets, and in or

* *Vide* notes, 2nd Volume du Dictionnaire Généalogique, par l'Abbé Tanguay.

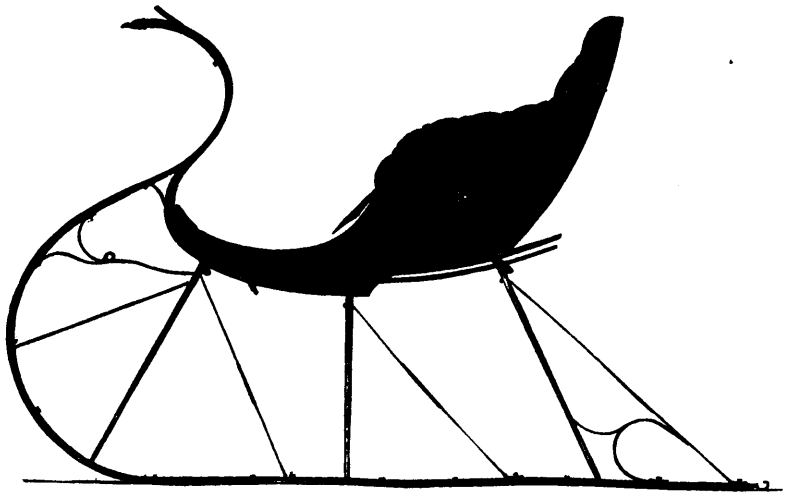
DRAWINGS OF CENTENNIAL SLEIGHS.—(From the Boston Hub.)



No. 1.—Russell's Portland Cutter.

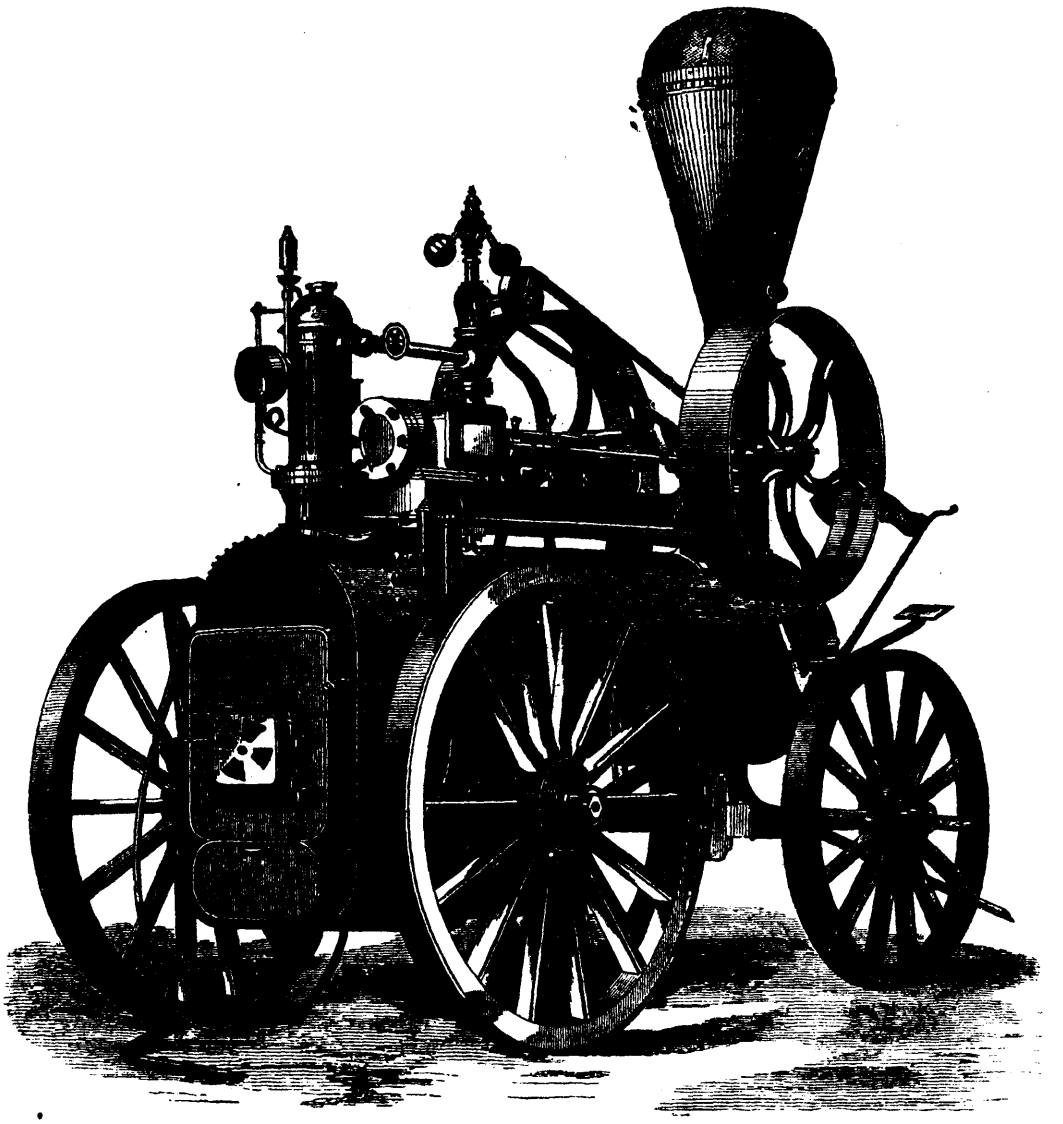


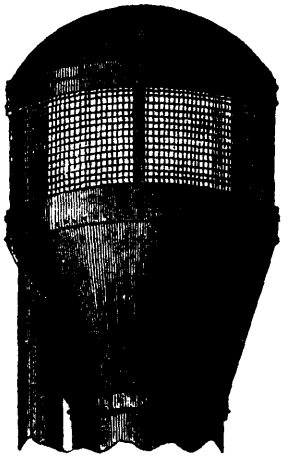
No. 2.—Shaw's Four-Passenger Albany Sleigh with Caleche Top.

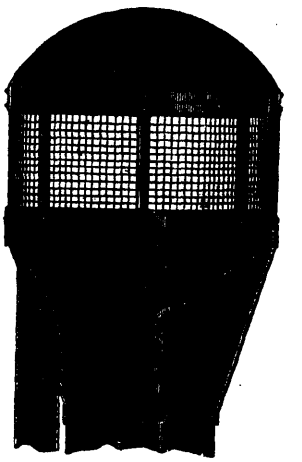


No. 3.—Wagner's Swell-Body Sleigh.

THE PHILADELPHIA EXHIBITION.—PORTABLE ENGINE.







about 1851 the Imperial Government waived their claim to the whole of the *Palais* "Harbour" in front, in favour of the City Corporation, granted them by letters patent from the Crown about the same time.

From early records it would appear that a main guard was formerly posted for duty in a guard-house on the opposite side of St. Nicholas street, not only to protect the old "Palais" premises, but to guard and overlook the more valuable public property to the eastward of that street. This included the Royal Dock Yard, King's Wharf, and a number of store buildings extending as far as "*La Canoterie*," nearly in front of the old blockhouse in Nunnery bastion, and bounded on one side by the foot of the cliff (now St. Charles street) and on the other by the high water mark, corresponding nearly with the present line of St. Paul street.

The ruins of "*le Palais*" and its accessoires at various times since 1775 have been fitted up temporarily for uses in connection with the troops of the garrison, such as stabling for horses, fodder sheds, washing apartments, military stores, caretaker's and issuer's quarters, fuel sheds &c., and the vaults were leased by the Ordnance at a later period for storing ice, valuable wines and liquors and for other purposes to the city inhabitants.

On these occasions the Government (military authorities) used to cover in the ruins with feather edged boards or shingles. During the great fire on 28th May, 1845 in the St. Roch's Suburbs, some thousands of cords of wood were piled in the Fuel Yard (King's Wood Yard) and several hundred tons of coal was stored in a lean-to-shed against the rear wall of "*le Palais*;"—the whole was consumed—the coals burnt and mouldered for nearly six months, and notwithstanding the solidity of the grouted masonry —such was the intense heat—that like a fiery furnace portions of the old wall gave way, and left the remainder, which had been exposed to the heat, in a very dilapidated condition.

On this occasion it was reported that an unfortunate woman and two children (I believe dwelling on the premises) were burnt to death in the fuel yard. If I remember correctly, great efforts were made by Mr. Bailey, a Commissariat Officer, and Mr. Boswell owner of the adjoining Brewery, to save the lives of the victims; these gentlemen in earnest went through a fiery ordeal, and it was not until their coats had been burnt off their backs and the hair of their heads and eyebrows crisped (if I may use the expression) to a cinder, that they had at last to fly to save their own lives.

On the withdrawal of the Imperial troops from Canada in 1870-71, the whole of the old Palais property was transferred to the Dominion Government.

I have the honor to be

Your obedient servant,

CHARLES WALKEM,

Late R. E. Civil Staff in Canada.

Ottawa,, July 1876.

RETURNING STEAM TO THE BOILER.—Our London exchange, *Iron*, says that a novel experiment was commenced on Friday with the 80 horse-power engine in Portsmouth dockyard. It was with a new pumping process, by which the inventor, Mr. R. M. Marchant, of Hatton Garden, undertakes to return saturated steam to the boiler of any engine, instead of condensing steam from the condensors. In other words, after the steam has exerted its power in the cylinder, the manufactured article itself is to be taken up and re-pumped into the boiler so as to be used afresh. Mr. Marchant claims for his invention that he is able to re-pump steam into the boiler without any expenditure of fuel beyond that which is required to overcome the mere friction of the pumps, and without subjecting them to pressure. The inventor contends that by the law of gases the pressure exerted by steam on one side of the piston represents by its elastic power, as in the case of the resistance of a spiral spring, the same expression of power in pressure on the other side of the piston; so that the elastic charge is always ready to give back the exact power expended to the purpose of its expression. Consequently, if Mr. Marchant's reasoning be correct, he expects to be able to return in volume and pressure to the boiler the equivalents of the power expended on the pumps, and so to apply the steam again to power. It therefore follows that, inasmuch as returning boiling water into the boilers, as steam will save the far greater cost which is expending in manufacturing it. As steam cost 75 in the 100 of the fuel which is consumed in its production, the saving which will be effected by the successful application of the principle will be great.

INDUSTRIAL DEGENERACY.

Much that is said in the following article, is applicable also to Canadian artizans.

The Centennial Exhibition, so far from fulfilling the peace bearing part designed for it by promoters, seems likely to be associated with little else than discord and melancholy reflections on all sides. In its own country it has long been a subject of contention between bitterly quarrelsome parties, and now it has indirectly furnished the text to a well-known German authority, Professor Reulaux, for a bitter sermon against his own countrymen. That gentleman is director of the Government technical school at Berlin, and he is also chief commissioner to the Philadelphia Exhibition. In the discharge of his duties he has of course made a careful inspection of the exhibits in the German department, and in a letter to the *National Zeitung* he has condensed his views, as the *Times* correspondent remarks, into three condemnatory sentences, one more crushing than the other. The first conclusion to which he arrives is that the main object of German manufacturers appears to be to produce an article which shall be cheap and bad. This, judging from his second observation, he considers they are well able to do, inasmuch as the men they employ are deficient in skill and wanting in taste. As a third and crowning remark upon the character of the German articles exhibited, the Professor is constrained to add that they show that the German nation is steeped in utter servility, so great is the number of Bismarck statues, Red Princes, and other heroes of war, in every conceivable material, from gilt bronze to common soap. These, it must be remembered, are the thoughtful utterances of the person officially deputed to report upon the latest cosmopolitan show of manufactures; and when to this position is added the responsible and dignified home *status* of the reporter, it is not surprising that this report has caused a painful excitement in German industrial circles. There seems to be no dispute as to the facts, whatever may be the general opinion as to their cause. German goods are now recommended by cheapness, not by quality, and all most concerned are agreed that careful finish, formerly a common attribute, is no longer such. Various reasons are given for this decline, but though differing in some respects, they are all probably reducible to one common source, and that, the political changes of the last few years. In the old days, when Germany turned out work that was and still is the subject of universal admiration, whether from the excellence of material, beauty of design, or careful execution, she was no more than a collection of communities. Capital was scarce, the people unpretending and stay at home. Their interest were generally bounded by the walls of the city within which they were born, and lived, and died. The craftsman of early times served a long apprenticeship, grew up and worked before the eyes of all who knew him, stimulated by the rivalry of his fellow-townsmen, and frequently encouraged by the personal patronage of discriminating patricians. His life was, as a rule, passed in comfort and freedom from excitement; thus, his trade became, with him, something more than a means of procuring an existence, it was the occupation of his life,, and, in some cases, the way to municipal honours, and frequently to even European fame. This condition of German artisans, of course, suffered a gradual modification, due to the improved facilities of communication, difference in the value of money, and so forth, and in later times the disturbed state of Europe exercised a very powerful influence. Nevertheless, we believe we are not wrong in affirming that, up to the time of the establishment of the North German Confederacy, the traditional aspect of German life, of the class above-mentioned, had not been entirely lost sight of, and certainly, up to that time, the decadence in German manufactures had not made itself prominent.

Since the establishment of the confederacy, barriers have been thrown down on all sides. The central authorities, though unwilling to concede parliamentary government, hastened to satisfy the demands of advanced political parties on all sides. The same policy prevailed at the re-establishment of the empire. The restrictions which formerly operated to prevent migration from place to place were removed, the strictness of the laws of apprenticeship and contract was relaxed, and facilities were afforded for marriage and relief of the poor. Moreover, many old trade regulations were swept away. When it is borne in mind that all these changes were made during a period of great commercial prosperity, when capital, finally augmented by the huge treasure won by war, was abundant, and capitalists seeking on all sides for workmen, it is not difficult to understand how matters have come to their present pass. History has told an old tale anew. The stern-domesticity, the grave contented spirit of

early workers, has again perished in the glare of imperial sunshine. The *panem et circenses* of imperial Rome have again been lavished in the form of gold and the firebrands of political and social agitation. A trade is now no longer a man's duty and absorbing occupation ; it is a mere means of making money. The German operative has become restless, he is seized with the desire to partake of the luxury which he sees indulged in by the classes socially above him. He grows discontented ; an injured feeling is the result, a feeling which is fostered by agitators, chiefly of the socialistic school. The educational facilities have as yet only yielded a partial culture, which does not mend matters ; for the artisan now estimates his position, not by the suggestions of economy or the tradition of his fathers, but by an exaggerated idea of what is due to him as a man of education and intelligence. Can it then be hoped that, in the midst of this struggle for an artificial existence, there can be that enthusiasm or that calm and contented application to work, without which all artistic and industrial progress is impossible ?

The strictures of Professor Beuleaux are confined to the manufacturers of his own country ; but thoughtful Englismen cannot disguise from themselves that in substance they are not altogether without application here. It is impossible to walk through the streets of any large town and not to be impressed with the carelessness and want of taste exhibited on all sides by our manufacturers and artisans. We do not mean to say that beautiful and perfect articles are not made, or that our workmen are not perhaps as capable of good work as ever they were, but we do say that good work is the exception, and every employer can substantiate the statement that workmen will not as a rule take trouble over the many small matters which make all the difference between what is excellent and what is only ordinary. Of late years the number of buyers has increased enormously, and competition among producers has become keener as a matter of course ; but discrimination and taste have not been present in proportion to the increase in the purchasing class. Money has been more plentiful, commercial prosperity great, and these and other causes have contributed to produce a feeling of restlessness and disatisfaction among our industrial classes. In face of heavy demands for wages and the cutting down of prices entailed by competition, manufacturers have not had much money to spend in educating public taste. So long as the public will buy anything short of the best, the demand will be supplied. On the other hand, artisans, when employment and wages are abundant, prefer to make their wages in the shortest possible time and in the easiest possible manner. They regard their work merely as an uncomfortable task, the performance of which sufficiently well to secure a sale, results in money to themselves. Their thoughts and interests are, as a rule, elsewhere than in their work, and when here and there a few men maintain an opposite and a healthier spirit, they are weighted in their course by the opposition of their fellows. The craftsman has been replaced by the labourer ; the skill and pride of the artisan is rapidly degenerating to an unintelligent and half-hearted spirit. This is a desponding view to take of the present state of our industries, but we fear it is only too justifiable. So long as we have a rich and carless purchasing class, a severe competition among manufacturers, and dissatisfied and ill-advised artisans, we cannot hope for much change for the better. We believe that signs are not wanting of improvement in the public taste, but even here and there there is discouragement. Our manufacturers agree that men are difficult to find who care to undertake fine work, even if they are capable of carrying it out. Good work requires care and thought, which workmen, as a rule, will not give if they can make money without so troublesome an expenditure. On the whole, we expect that the change for the better, when it does come, will be found to be due to pressure from without rather than to any initiative taken by the industrial classes themselves.—*The Engineer.*

PARALLEL RULES.—For lines parallel to the sides of the drawing board, the T-square is the best possible parallel ruler, aud may be used in conjunction with a set square of 45 deg. for mitre and similar lines. The set square of 60 deg. by 30 deg. will give increased facilities in setting out many ornamental geometrical forms. A T-square with shifting head is also very useful ; but as ordinarily made it is clumsy. For parallel lines not falling within the range of the T and set squares, the best tool, in the opinion of many, is the rolling parallel ruler. This is more quickly set to any two points, and more cleanly in use than any other form. A plain black ebony one is best for general use. A set square and straight edge are used by many, but they more easily get out of place and soil the paper. Set squares and T-squares should be French polished, and then they can easily be cleaned. —*Technologist.*

SLEIGHS EXHIBITED AT THE CENTENNIAL EXHIBITION.

(See page 292.)

SHAW'S FOUR-PASSENGER HALF-TOP SLEIGH.

No. 1.—A light and graceful looking sleigh, although the proximity of the seats prevents the possibility of making a good-shaped top.

The principal dimensions are :

Width of front seat, 36¾ inches ; width of hind seat, 38 inches, Track, 39 inches. The runners at the forward extremity are contracted to 18½ inches.

Painting.—Blue, striping in gold, carmine, yellow, and white. *Trimming.*—Crimson plush.

RUSSELLS PORTLAND-CUTTER.

No. 2.—THIS is a handsome cutter, plain and tasteful in both design and finish. The body has a pleasing shape, which is the more praiseworthy because the simplicity of its lines gives little room for the display of form. The front-finish of the body is the latest used for this pattern of cutter.

The principal dimensions are as follow :

Width of seat, 33½ inches ; width at bottom, 30 inches ; width of hody over all, 34¾ inches. Track, 36 inches out to out.

Painting.—Body, vine color, with black border and a fine line of gold. Running-part black, with gold striping ; trimming in pink plush.

WAGNER'S SWELL-BODY CUTTER.

No. 3.—THIS pattern shows several original features. and its effect is unquestionably good. The somewhat increased cost of the body, caused by swelling the sides, is amply repaid by the fine appearance of the body when painted.

The seat-frame is 25 inches wide. Track, 39 inches.

Painting.—Body, light, vine color, with black border.

SCIENTIFIC NOTES.

WASHING FLANNEL.—The most effectual way to avoid shrinkage in flannel and woollen goods is to plunge them, when new, into boiling water, and let them dry without wringing.

CLEANING DEAD SILVER.—Dead or engraved silver goods should never be cleaned with plate powder, but be washed out with a soft brush and some strong alkali, and well rinsed afterwards. When the dead or frosted parts are quite dry, the polished parts are carefully cleaned with powder.

USE OF COLOURED GLASS IN HOTHOUSE.—The general result of several carefully-conducted experiments seems to be that, although violet glass favours somewhat germination, yet, taken as a whole, none is so satisfactory in its effects as the plain uncoloured glass, which permits a nearly free passage of the different coloured rays, as they exist in the sunbeam.

NON-INTOXICATING DRINKS.—To 2lb. of white sugar, 2oz. of best Jamaica ginger, well bruised, 2oz. of cream of tartar, and the rind of two lemons, add two gallons of boiling water ; stir altogether till they become lukewarm. Toast a slice of bread, pour on it two tablespoonfuls of good fresh yeast, and place it to float on top of the mixture. Cover the whole up for 24 hours, then strain and bottle it, taking care not to fill the bottles ; cork and wire it securely. This quantity will make three dozen bottles, and will be ready for use in three or four days. Lemonade—A capital glass of lemonade may be made by adding two tablespoonfuls of lemon juice to two spoonfuls of sugar dissolved in a tumbler of water. If a small quantity of carbonate of soda is added, it will afford a cooling effervescing drink.

TRADE MARKS IN AMERICA.—In the United States a bill has recently been introduced into Congress by Senator Conkling, to supply deficiencies in the present law regulating trade marks. The counterfeiting and false use of trade marks are now regarded only as an invasion of the property rights of their owners, an injunction and suit for damages beiug the only remedy. The piracy of trade marks has, therefore, flourished because only the actual owner could interfere with the pirate. The consumer, who is in many cases as great a sufferer, can rarely detect the imposture ; and if he does he has no redress. Mr. Conckling's bill is directed at providing an adequate punishment for the wrong by making the counterfeiting of trade marks a penal offence. An imprisonment not exceeding two years is imposed upon any person who engraves, or knowingly has in his possession, or sells, or offers for sale, or uses counterfeit trade marks ; and also upon any person making dishonest use of empty packages with genuine trade marks thereon. All such imitation goods are, furthermore, to be forfeited.

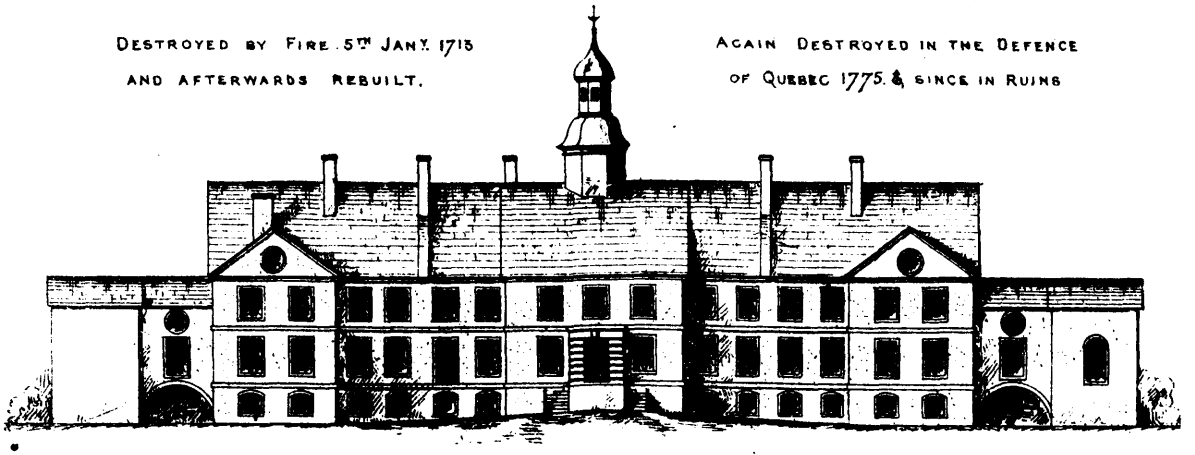
QUEBEC:

INTENDANTS PALACE:

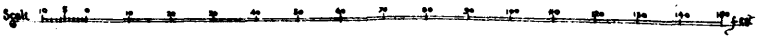
BUILT 1684.

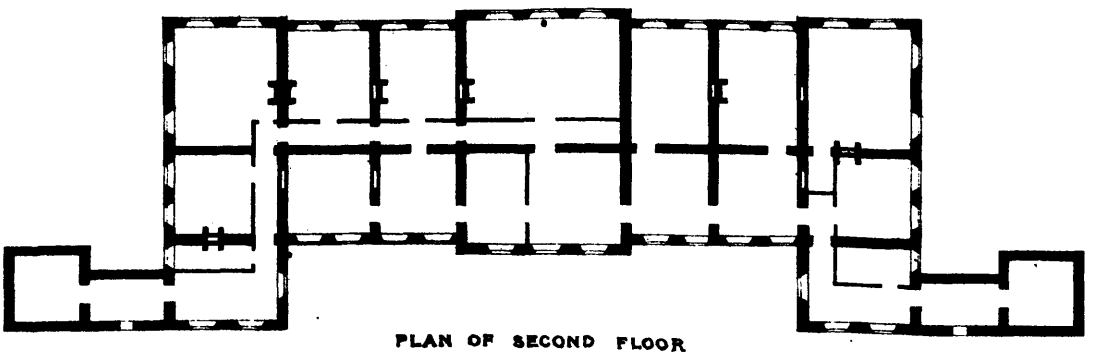
DESTROYED BY FIRE 5TH JANY. 1713 AND AFTERWARDS REBUILT.

AGAIN DESTROYED IN THE DEFENCE OF QUEBEC 1775. & SINCE IN RUINS

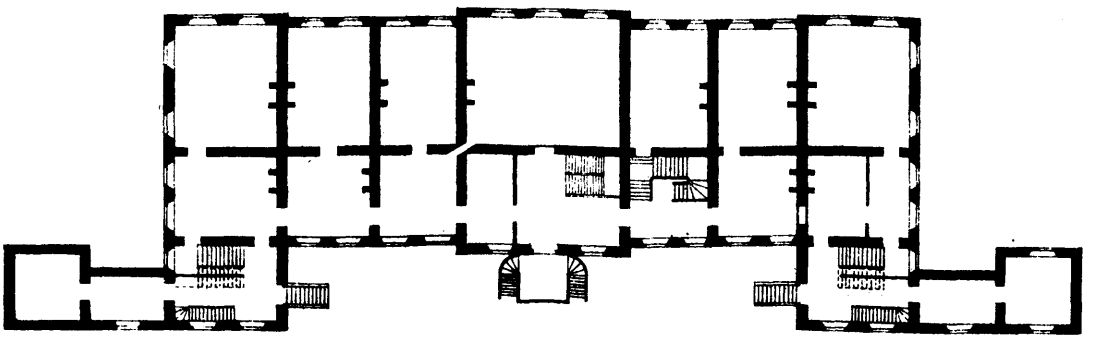


MAIN FRONT





PLAN OF SECOND FLOOR



PLAN OF FIRST FLOOR

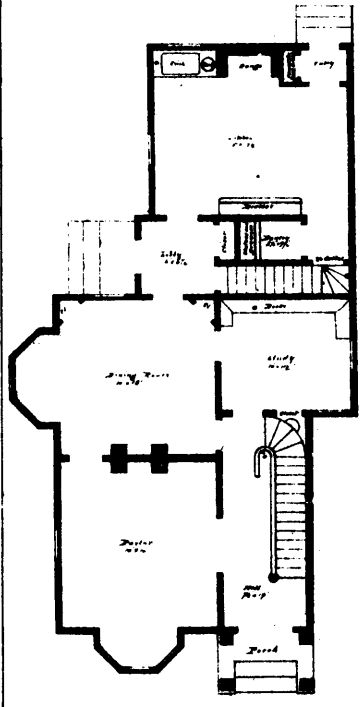
Charles Wolfenden
late R.E. Staff Canada

MAY 1876

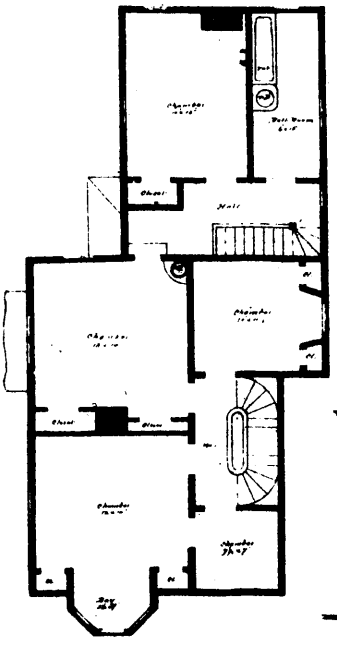
DESIGNS FOR SUBURBAN RESIDENCES.—(From Atwood's American Homesteads.)

Side Elevation.

Rear Elevation.



First Floor.



Second Floor.

Front Elevation.

WOOD CARVING.

In a well written article on Wood Carving in the "Timber Trades' Journal" are the following pertinent remarks :—

Scheleg regards wood-carving as "the original and oldest form that fancy took" to gratify the artistic longings of the spirit stirred by the desire to communicate somewhat of its own immortality to the objects of its delighted apprehension ; and as preceding sculpture among human exertions of skill. There seems to be little room for hesitancy in believing that it is the first-born of the imitative and decorative arts. The notices we have given seem to substantiate as a fact that wood-carving was one of the earliest means of giving "invention light," while—

'In scorn of Nature, Art gave lifeless life."

In Egypt and in Greece carving assumed a high position among the arts ; and among the Jews, as we have seen it, it was the subject of divine inspiration. Thus, in Judea it was put under restraints which did not affect it in the countries on the north and south of the Mediterranean, where art ran into idolatry. Beauty was to be admired, not worshipped, by the Jew. The sensuous Greek idolized, and the sensual Egyptian worshipped it, till imitative art became a peril and a snare. Rome, with a less keen sense of the beautiful, but with a kinder grace to imitation, made imitative and decorative art an article of luxury, and wood-carving was a lucrative employment. Not only in the house-furniture, but in the ornaments of vessels, the adornment of curule chairs, of instruments of music, &c., the carver's art was in great requisition, but also in the production of statues for theatres, the forum and the *lares* and *penates* of the mansionly *penetralia*, as well in the formation of images of the *Dii Selecti*.

Among the Arabians, who, like the Jews, were prohibited from the making of carved images for worship, the carver's art was restrained by religion on one side, but it took its revenge on the other by passing beyond the bounds of fancy into the byways of fantasticality. At first Arabian art was confined to the imitative reproduction of foliage, flowers, fruit, and tendrils of plants and trees curiously interwrought and elaborately intricated ; yet often so producing illusions of the senses as to be mistaken for realities, like the "painted grapes" of Zeuxis. Eventually, however, art scorned the trammels of reality, and proceeded to produce all sorts of fanciful combinations, including and grouping tree, plant, and flower life with that of birds, beasts, and reptiles, and sometimes introducing the human figure in its bas-relief. These fantastic excursions of imagination have got the name of Arabesques. Two richly-carved doors were sent from Constantinople as a present to Charlemagne in 803. Towards the close of the middle ages, wood-carving became a favourite art among the Germans, who still maintain a singular dexterity of hand and skill of workmanship in that department of ornamental industry. Elaborate and highly artistic carvings were employed on alters, pulpits, and reading-desks, in the cathedrals which then arose, and the chisel was used upon the woodwork of the interior to harmonize it in effect with the sculptured ornamentation of the exterior. For the interior of a Gothic structure the wood-carver is the right man in the right place. Marbled sculpture is too cold and classic to gratify the eye amidst the grotesque elaborations to which Gothic architecture lends itself so readily. In many of the churches of Pomerania, particularly in the churches of Erfurt, Altenberg, and Prague, there are splendid specimens of sculpturesque wood-carving. Nor should we omit to mention Bruggeman's great altar in the cathedral of Schleswig, or the marvellous transubstantiation bas-relief in the church at Tribsers. Albert Durer's fame as a wood-carver is unrivalled ; but it is impossible that the immense number of works of high-class art attributed to him can be really his. Michael Wohlgemuth and Veit Stoss are names of eminence as wood-carver's ; and who is there that has ever seen the medallion portraits cut in box-wood by Hans Schwartz, of Augsburg, can doubt the skill of the artist or fail to see possibilities in wood-carving which have not been sufficiently developed ? Among the churches of Belgium there are many admirable oak carvings. In the cathedral of Antwerp and the churches of St. Jacques and of St. Paul there, there are several precious ones. Among artists in wood no name in England equals in reputation that of Grinling Gibbons. It is one of the unforgetable things in a visit to Chatsworth to have seen Gibbons's wood-carvings. Such combinations of games, sporting tackle, fruits, and flowers, have surely never been matched for variousness, ingenuity of grouping, and delicacy of execution ! In Windsor Castle and at Hampton Court a good deal of his work may be seen ; but the choir of St. Paul's is the most readily accessible specimen of his cunning workmanship. Very excellent specimens of wood-carving have graced the Exhibition of 1851, the Manchester Fine Arts Exhibition, and the more recent exhibition of 1862. At Manchester Fine Arts Exhibition, in Brussels, held in 1861, the Belgian talent for wood-carving was most interestingly shown. Few visitors who have passed through Dieppe can have forgotten the singular dexterity of the wood-cutters—rather even their carvers, who ply their vocation in the vicinity of the harbour. The recent popularity of furniture after the antique has given a considerable development to the art of the carver. The turn taken of late in regard to ecclesiastical ornamentation tends in the same direction, and cannot but aid in reviving this highly ingenious and skillful form of timber industry. But we require a large development of taste for the decorations of the wood-carver in the splendid mansions of England. Even in princely palaces we have too few analogues of the old oak chest of which Roger sings as—

"Richly carved by Antony of Trent,
With Scripture-stories from the life of Christ."

In the production of ornamental furniture for our households, of deed-chests, and library fittings, of wardrobes, room-panellings, doors, mantel-pieces, staircase railings, and all large articles of plenishing, there is much room for the introduction of the statuesque and the sculpturesque, and for the application of the fine arts to the enhancement of timber articles. All pieces of furniture made of pear-tree, lime, maple, box, oak, American pine, lend themselves readily to the artistic operations of the gouge and chisel, and give opportunity for the application of the carver's art. Artistic household furniture, uniting beauty with utility, the addition of carved art to cabinet work, might all be made much more advantageous to the development of taste if the art of wood-carving were liberally patronized among us.

With the foregoing remarks by way of introduction, we will now enter upon the subject of wood-carving, bearing in mind the resolution in a previous chapter to be as explicit as possible, so that the reader will not be so liable to err in manipulation, or require to ask any questions for elucidation.

TOOLS.

The illustrations of Tools on the accompanying page shows the leading kinds of carving tools, and there are several sizes of each kind as well as a variety of curves for the gouges.

No. 1.—Carver's Screw, a description of which, with its use, will be found in another page.

No. 2.—Carving Chisel.—Useful for grounding, also in cutting round the pattern on commencing a piece of work.

No. 2.—Carving Gouge.—Used in cutting curves, &c., useful in cutting out the design.

No. 4.—Skew Carving Chisel.—This is a very useful tool to clear out corners, and it is sometimes called a "Firmer." It is made on the skew for right or left hand corners, and called right or left hand Firmer.

No. 5.—Bent Carving Gouge.—An admirable tool for "bosting" leaves, &c.

No. 6.—Spoon Bit or Entering Chisel.—This tool will be found to produce smooth work in grounding, &c., where a straight chisel would not be of any use.

No. 7.—V, or Parting Tool.—Used for veining leaves, outlining designs, and bringing up prominences in various subjects.

No. 8.—Bent Parting Tool.—This tool, by being bent, reaches situations in the work the straight tool will not touch.

No. 9.—Spoon Bit or Entering Gouge.—Used for bosting foliage, and any subject requiring cutting into undulations, such as a ribbon design.

No. 10.—Maccaroni Tool.—A beautiful tool, often used in carving the mid-rib of a leaf, &c.

No. 11.—Table, with Carving.

A Bench or Work Table is necessary on which to lay the work. It should be strong and not easily shifted, as the work will be secured to the top by means of a screw or cramp. The whole force of the cutting operations will have to be resisted by the bench. It would be as well to screw it down to the floor or place it against a wall.

If the amateur invests in a strong bench it need not be very large, and should have several holes in the top so as to be able to secure the work by screws or cramps.

The illustration represents a table used for domestic purposes, with the work fastened to a board and cramped to the edge. A hole about four or five inches from the edge would be handy if a screw is employed, and near the middle for a cramp.

The following gouges should be purchased :—Half-inch gouge (straight), quarter-inch gouge, half-inch flat tool, quarter-inch flat tool, eighth flat tool, a parting tool, a half-inch firmer, a

corner firmer, backbend, a quarter-inch grounder, maccaroni tool.

A Carver's Screw will be necessary to secure the work to the bench. This screw is pointed at one end, and there is an easy-fitting nut to tighten with the thumb and finger.

A Cramp may be useful where the work is proposed to be done on the kitchen or sitting-room table, as it would not be wise to make a hole through a table in domestic use, the cramp would secure the work on the edge.

A Mallet, not too heavy, is also used sometimes in commencing operations in clearing away the wood when opening out the design.

Several other tools would be handy and useful, such as a vice as mentioned in a preceding chapter, a bow-saw and horse, a pair of compasses, a screwdriver, files, gimlets, glass paper, glue-pot, pair of hand screws, and also a few more gouges of different curves, and a few punches of various patterns.

LATHES EXHIBITED AT THE CENTENNIAL.

The *Engineer* notices in its number of July 14th, some of the machines exhibited at the Centennial, of which we illustrate a few on page 301.

"The company exhibit several lathes of different dimensions, one of the best being a 16in. weighted engine lathe. This size of lathe is well adapted for general work, swinging 16in. over the bed, and 8in. over the carriage. The spindles are of steel. The front bearing of the live-spindle is 3½in. long by 1¾in. diameter. The boxes are of cast iron, lined with best Rabbitt-metal. The cone is turned inside and outside, to balance it, and is driven by a belt 2¼ inches wide. With the usual set of gears, screws of from 3 to 48 threads to the inch can be cut. This lathe is furnished with Slate's taper attachment, by means of which an article can be turned or bored of any desired taper. By its use it is not necessary to place the lathe centres out of line; the varying length of the piece turned does not affect the taper; the degree of taper desired may be accurately adjusted by a graduated scale on the attachment, so that no preliminary or trial cuts are necessary; it is as well adapted to turning tapering holes on chucked work as for the outside of work; and it may be readily released from operation without removing any part of it from the lathe. It has always given perfect satisfaction.

The grinding lathe is adapted for a great variety of work, such as sizing reamers—straight and taper—arbors, bushings, rings, plugs for templates, and many other articles, finishing equally well the periphery, ends, and sides. The carriage feed of this lathe is either automatic or by hand, the reversing being accomplished by means of bevel gears and a clutch connected with the feed rod. The extra countershaft has a drum for driving the grinding wheel. The Slate taper attachment is placed on the lathe for finishing tapering work. The ways of the bed are covered on each side of the carriage with composition guards attached to the carriage, protecting the ways from dust a distance of 36in., and the taper attachment and reversing gears are similarly protected by hinged coverings. Dimensions: Length of bed, 6ft.; swing over bed, 13in.; swing over carriage, 6in.; grinds in length, 3ft. 10in.; weight, 950 lb.

The pillar shaper, or, as it is sometimes called, the compound planer, is a handy tool, useful for a variety of jobs, particularly adapted to die work, and in a large proportion of cases a substitute for the ordinary and more expensive shaping machine. The engraving shows a 10in. machine, which stands on a hollow column, the base of which measures 36in. by 27in. Even the gearing is inside of the pillar and out of the way. The stroke may be graduated to any point within its extreme limit, the cutter-slide has a quick return, and the cross-feed is automatic and adjustable. All the slides and bearings are fitted perfectly by scraping, the nuts, screws, and wrenches are hardened, and the construction is excellent and accurate throughout. The following is a list of weight and dimensions, including countershaft and vice:—Extreme length of stroke, 10in.; traverse of bed, 16in.; between table top and bottom of slide, 11½in. weight, 1700 lb.

THE NOBILITY OF THE PLOUGH.—Among savage tribes a head-dress or covering is regarded as a mark of distinction, which only the highest in rank among them is entitled to wear. A Cheynnie Indian, who had accompanied Humboldt in his journey to the Oroonoko, was brought by him to France. He was so much struck on landing, when he saw the ground tilled by a peasant with a hat on, that he thought himself in a miserable country where even the nobles followed the plough.

VEGETABLE LEATHER.

Under the title of "Improvements in the Manufacture of Vegetable Leather," a patent has recently been obtained in this country for an invention which promises to utilise certain waste or cheap products. Fucus of several species and Laminaria are well-known seaweeds, as plentiful on the sea-coast as grass in the fields, and waste textile materials of vegetable origin are still in sufficient abundance to find profitable employment in the manufacture of this "leather."

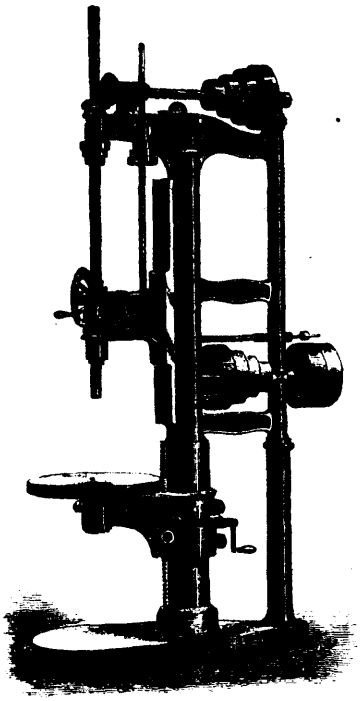
Sheets of carded wadding are manufactured with cotton waste or cotton itself, according to the quality required to be produced, uniform in toughness, length, and width, which sheets are placed on polished zinc or other metal plates, then the wadding is coated with a concentrated decoction of "fucus crispus" or pearl moss, or other fucus or mucilaginous lighter (rock moss), or any other similar mucilaginous substance may be employed. The metal plates require to be kept hot, in order to allow the mucilaginous decoction to penetrate thoroughly into the filaments of the cotton. The sheet is then dried quickly, thus giving to the surface applied to the metal plate a glazed or polished appearance resembling the gloss of ordinary leather. The sheet thus prepared is passed between two heated cylinders or rollers perfectly polished, having a space between them the exact thickness required to be given to the sheet to be produced. Great pressure is required in order to press and felt all the filaments of cotton thoroughly together, and thereby render the thickness of the sheet uniform. The sheet is then coated with boiled linseed oil, and dried in the open air, or by means of artificial heat. When the sheet is dry a coating of thin vegetable wax is applied, according to the use to which it is to be applied, and the sheet is softened by passing it through heated fluted rollers, by which means it is softened in a uniform manner; it is then passed through other polished rollers, according to the quality of the leather required, either plain, morocco, embossed, glazed, or otherwise, and it is then bronzed, silvered, gilded, or varnished, and finished in like manner to ordinary leather. French, vegetable, or similar leather thus prepared is waterproof, and easily stamped.

Elasticity is given to vegetable leather thus produced by placing the sheets impregnated with the decoction of fucus or other mucilaginous substance between two plates perfectly adjusted, having the design embossed or in intaglio. Great pressure is then applied to the plates, and the dried sheet is then passed through rollers, which, by flattening the embossed parts, form a smooth surface, which is then treated as above stated, and becomes elastic after the oil is dry. Pressure may also be successfully applied before the leather is impregnated with siccative oil. The material can be made perfectly white in the manner previously described, by selecting very white fucus, and by bleaching the oil to be used, and various colours from the lightest to the darkest may be obtained. If the leather thus produced is required to be inodorous it is only necessary to wash the oil in a weak solution of chloride of lime. A method of preparing vegetable leather of this character for use as cheap sole leather consists in thickening the decoction of fucus or mucilaginous lichen with cotton waste or dust until it becomes a thick paste. The paste is then run into moulds or blocks, and is pressed by means of an hydraulic press, in order to form solid blocks of any suitable thickness, which are then dried and cut by saws or otherwise into plates or sheets of the ordinary thickness of sole leather. These plates or sheets are then soaked in boiled linseed oil, and when dry are pressed again between polished metal plates.

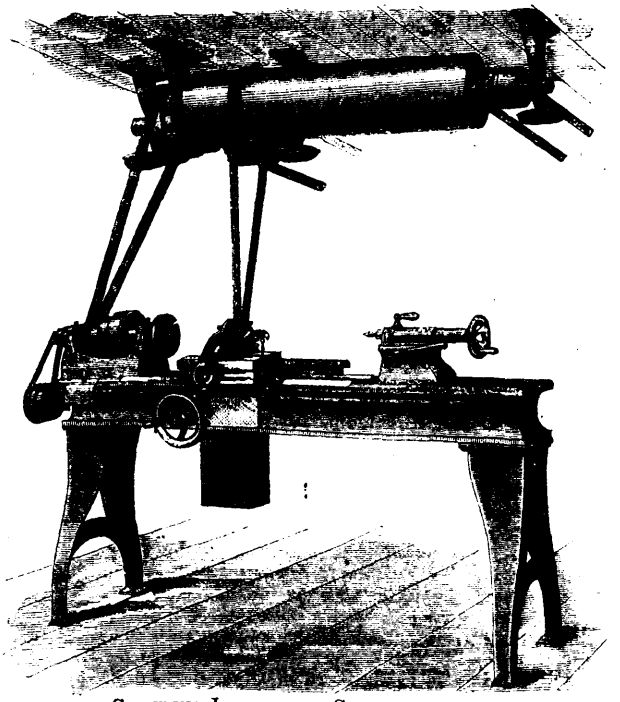
Beside the use of cotton waste and dust, all kinds of textile materials and their waste, especially cocoa-nut fibre waste and dust, may be employed in the manufacture of vegetable leather suitable for carpets or floorcloth of novel and superior quality. This new or improved "French vegetable leather" can be used in place of natural leather, and may be employed for covering tables, chairs, sofas, travelling bags, for the lining or bodies of hats, caskets, carriages, harness, military equipments, slippers, bookbinding, and various other purposes.—*English Mechanic.*

FAIR PLAY.—A fox being hard run took shelter under the covering of a well, and by the endeavours used to extricate him from thence he was precipitated to the bottom—a depth of 100 ft. The bucket was let down; Reynard laid hold of it, and was drawn up some part of the way, when he again fell. The bucket was let down a second time, when he secured his situation in it, and was drawn up safely. He was afterwards turned off, and fairly beat the hounds.

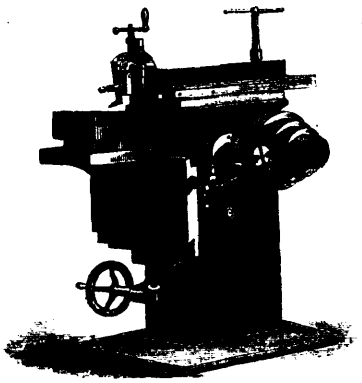
MACHINE TOOLS.—EXHIBITED AT THE CENTENNIAL.



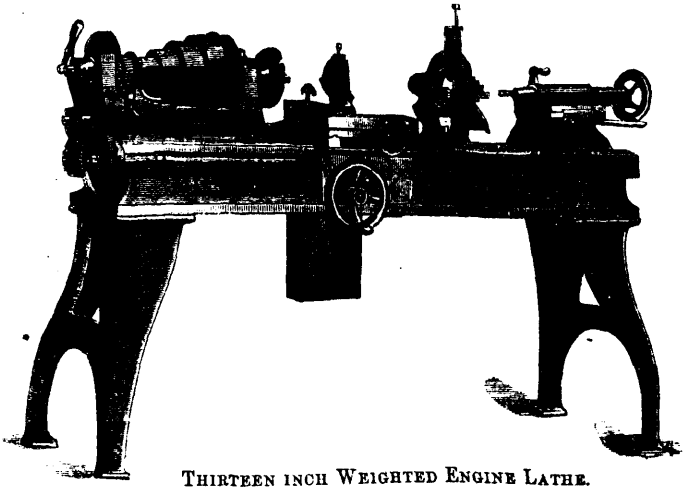
No. 2.—Upright Drill.



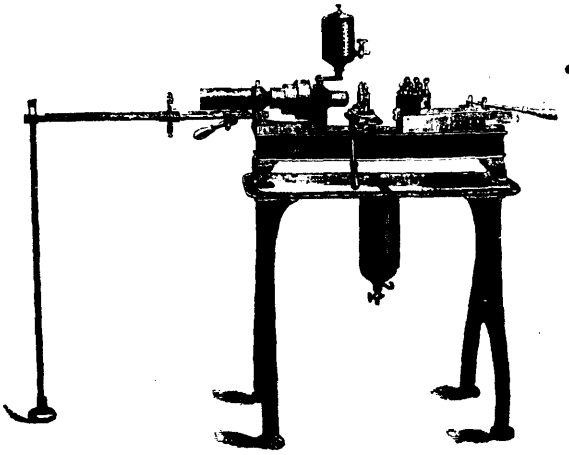
Grinding Lathe, two Countershafts.



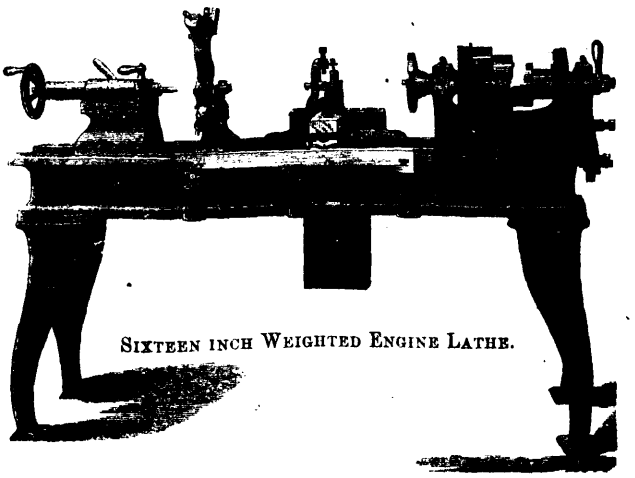
Ten inch Pillar Shaper.



Thirteen inch Weighted Engine Lathe.



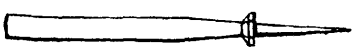
No. 1.—Screwing Machine with Wire Feed.



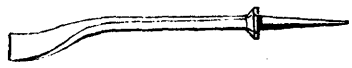
Sixteen inch Weighted Engine Lathe.

CARVING TOOLS.

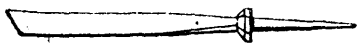
1.—*Carver's Screw.*



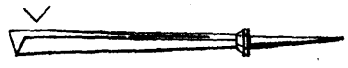
2.—*Carving Chisel.*



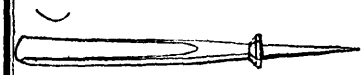
6.—*Spoon Bit or Entering Chisel.*



3.—*Skew-Carving Chisel.*



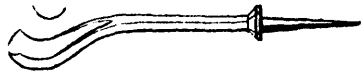
7.—*V, or Parting Tool.*



4.—*Carving Gouge.*

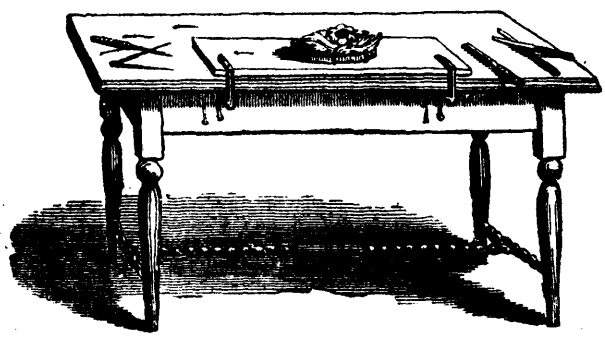
8.—*Bent Parting Tool.*

5.—*Bent Carving Gouge.*

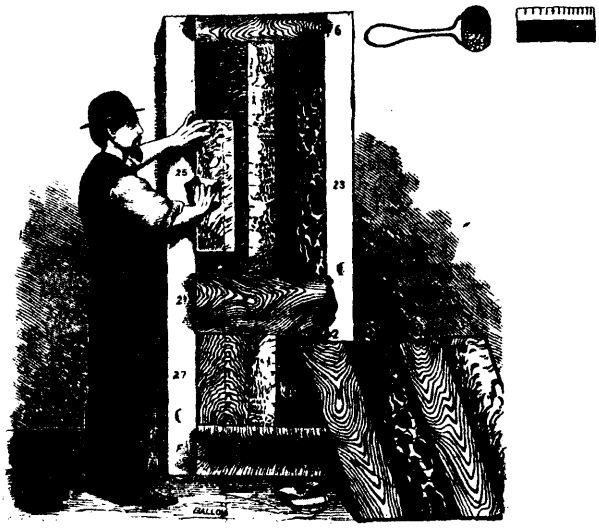


9.—*Spoon Bit or Entering Gouge.*

10.—*Maccaroni Tool.*

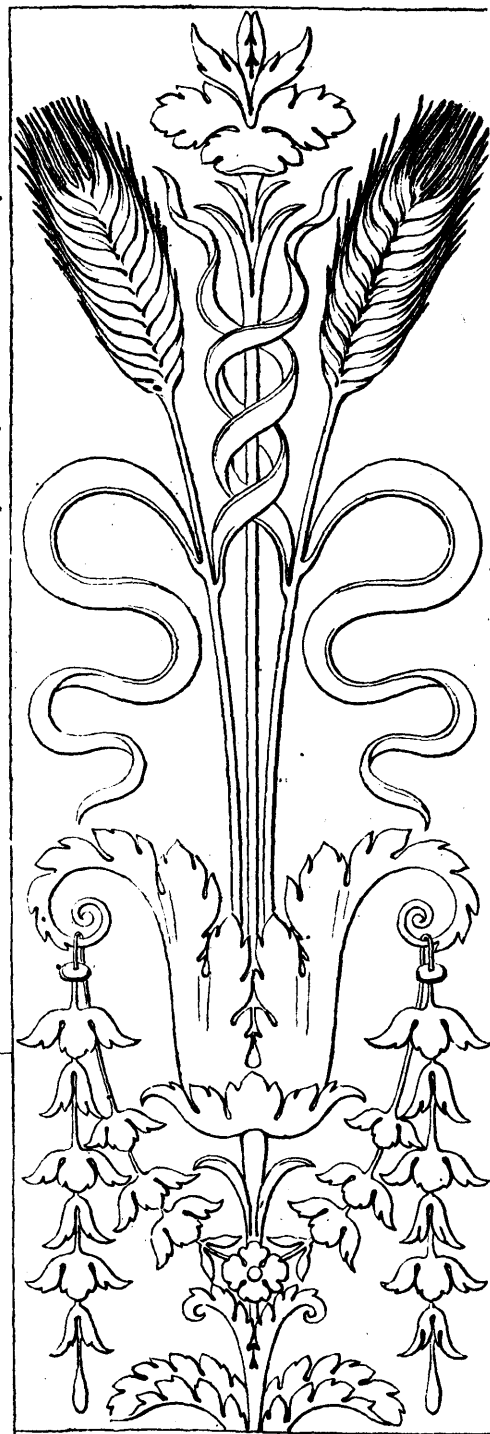


11.—*Carving Cramped to Table.*



CALLOW'S METALLIC GRAINING TOOLS.

FREE-HAND DRAWING.



FROM A PILASTER IN THE CATHEDRAL, FLORENCE.

IMPROVED TRAMWAY CARS.

(See page 304.)

In the railway and tramway carriages of modern times we have reverted to the rigid "four-wheeler" of ancient history. As our main lines vie with the Roman roads in uncompromising straightness, the evil is not much felt there; but the audible grinding of a train around a sharp curve testifies how the wheels are being dragged out of their natural course by the action of the rail upon the flanges, much to the detriment of both. But if the use of this primitive machine upon the well-laid curves of suburban railways be disadvantageous, it is a positive anachronism to employ it upon street tramways, turning the self-same street corners with its perch-bolt brethren of the road.

No doubt the conditions are very different, but cannot the same facility for turning a corner be given to a vehicle running upon rails, without sacrificing its steadiness or any other essential condition?

This question has been answered in the affirmative by the tram-cars of which we give an illustration. The peculirity of these cars consists in the mode in which the wheels are mounted. There are three pairs, which are not fitted to the under-frame, but are so connected by an arrangement of movable frames of simple construction that they mutually control each other's position, and in such a manner that each axle is always held in the right position for rolling along the rail, whether straight or on the curve, and whatever the degree of curvature. Thus, when the car is traversing a straight line, the axles are held firmly in a parallel position, and when the car enters a curve are automacally shifted into a radial position, like the wheels on a turntable, and transverse the curve with the same ease. This action is made clear by the accompanying diagram, by which it will be seen that the leading and trailing trucks swivel on central pivots, and the middle truck is capable of lateral play in the friction-plates, the flanges of which act as guides.

The trial car which has been worked for some time in the regular daily service between Westminister and Greenwich, subjected to every posible test under varying conditions of weather, state of rails and abnormal loading, has given results which are eminently satisfactory. Although the length of the wheel-base is more than double that of the ordinary cars, yet curves of 25-feet radius are traversed with the same ease and smoothness as a straight line. Owing to the fact that the trial car was built for use upon a steam tramway, its construction is somewhat heavier than would have been the case for ordinary work, and carries a larger number of passengers than usual; yet, such is the reduction of tractive resistance, on the straight as well as on curves, obtained by this system, that the car pulls lighter and distresses the horses less than those in ordinary use. The long wheel-base, besides imparting great steadiness, affords also a good support for the under-frame of the car, and prevent the "hogging"—due to excessive overhang—which is so noticeable in ordinary tram-cars. Experience has entirely dissipated many doubts which were freely expressed as to the behaviour of these tram-cars in passing the "open points," and in being put on or off the track, the facility with which they are handled proving them in every way superior to the rigid four-wheelers.

As important advantage of the invention is, that it can readily be applied to the bodies of existing tram-cars, and that the expense is so small in comparison with the notable saving in horse-flesh, and wear and tear of rails and wheels. Indeed, the results achieved have amply justified the expectations previously formed.

SYERS' "RELIANCE" PUMP.

(See page 304.)

The accompanying engraving illustrates a neat little pump recently brought by Messrs. P. R. and A. E. Syers, of Manchester. The cylinder, valve chamber, and air vessel are cast in one piece, and are bored out in one setting. The piston and valve rede are of steel, and they work through gun-metal glands. The pump valves and seatings are gun-metal, and the ram works through a brass bush. The valves are all readily accessible. This pump is extremely convenient for readily filling boilers which have been standing or blown out. When used for this purpose, a winch is fitted on to the crank shaft at the part shown in the cut, and the pump may then be worked by hand. The engraving sufficiently explains the construction of this useful little machine.

Fallen Bread.—An Irishman, on hearing that the price of bread had fallen, exclaimed, "This is the first time I ever rejiced at the fall of my bist friend!"

DAVIS & COCHRANE'S MINING DIAL.

(See page 304.)

The miner's dial or circumferenter, here illustrated, is entirely of novel construction; the advantage claimed for it is that angles can be taken by it with ease and accuracy, even when used by inexperienced hands, and the tediousness of surveying is very much lessened, as the instrument requires no reading. The following description will serve to explain its construction: B and E are exposed portions of a metallic paper margin or ring about 8½ in. outside diameter, and 1½ in. wide; this margin is fixed to the base-plate of the dial, and to which also the sights are attached; this base-plate moves freely round, carrying the sights and paper margin, leaving the compass, the covering plate C, and remaining parts of the dial clamped to the legs. At D is a semicircular arm working over the compass on axes at G G; this arm carries a brass marker A, which at one end is pointed, and at the other flat, or knife edged. Besides the protection afforded to the ring of metallic paper by the cover C, a small shutter covers each of the apertures at B and E while the instrument is being carried. If the pit should be very damp or dirty the extra precaution may be taken of using a double paper margin with a sheet of carbon paper interposed; by this means a duplicate would be taken of all the angles of the survey.

The first process is to set the dial to the north point, and then to bring down the marker A, and puncture the paper both at B and E; these markings will give the north and south lines on the paper margin; then take the angle required in the usual manner and puncture the paper again, numbering each puncture on the margin; these numbers are booked with distances, &c., to each. If two or more punctures should fall together on the paper margin the marker A may be elongated by the screw F, so that half a dozen or more punctures may indicate the same angles without making any confusion in the margin. In plotting the survey the paper margin is removed from the dial, the north line or points on the paper margin are made to coincide with the north line on plan, and the survey is plotted at once without the aid of a protractor, the paper ring serving as protractor, and giving all the angles required. When the dial is required for setting out, a paper protractor is supplied in place of blank paper margin, and the angles read off by means of the marker A.—*Engineering.*

FOREIGN BODIES IN THE EYE.

(See page 304.)

Parties of cinder, dust, or fragments of metal, often get into the eye, and cause a good deal of trouble. Sometimes they are dislodged, and washed out by the extra secretion of tears brought about by the irritation produced by the body. Sometimes this process does not give relief, and it is necessary to resort to some process of extraction. A popular, and often useful plan is to take hold of the lashes of the upper lid, separate it from the eyeball, so that the lashes of the lower lid will slip up in the space, acting as a brush to the inner surface of the upper eyelid. This, of course, cannot remove anything, as a rule, from the eyeball. A better way is the usual one of holding knitting-needle over the upper lid, close to and just under the edge of the orbit, then, holding it firmly, seize the lashes of that lid by the fingers of the disengaged hand, and gently turn the lid upward and backward over the needle, or substitute used. Movement of the eyeball by the sufferer, in a strong light, usually reveals the presence of the intruding body, so that by means of a corner of a silk or cambric handkerchief, it can be detached and removed.

Should the foreign body be *imbedded* in the mucous membrane covering the eyeball or the eyelid (conjunctive), a steady hand and a sharp-pointed instrument will usually lift it out.

The foreign body often cannot be seen, but the person assures us that he *feels* it. Often he does not really feel the *presence* of the body, as much as the roughness (really, a wound) left by it. In such a case, or even if the body has been seen and removed, a soothing application to the injury is as useful as the same thing applied to a wound of the hand. Take a spoon or cup, heat it, and pour in a few drops of laudanum. It will soon become dense and jelly-like. A few drops of water added will dissolve this gummy material, and the liquid thus formed may be applied by the finger to the "inside of the eye," as they say. The laudanum is opium dissolved in alcohol. The alcohol is somewhat irritating, but is easily *evaporated* by the gentle heat, leaving an extract of opium, which is dissolved in the water afterwards added.

The comfort derived from this simple and always accessible preparation, after the injury to the eye by a foreign body getting

into it, is of the most satisfactory kind. In no case use any of the popular "Eye Waters," or "Salves."

Not an uncommon accident is a fragment of lime in the eye. The delicacy of the organ, and the activity of this powerful olkali, require all that is to be done to be done at once. Do not waste time by attempting to *pick* it out, but *neutralize* the alkali by a few drops of vinegar (which is dilute acetic acid) in a little water. A few drows of lemon juice, in a little water, will answer just as well, if introduced, like the vinegar, into contact with the lime. Even when done rapidly, the ulceration caused by the alkali will be some some days in disappearing. In all cases where lime has entered the eye, even when these things have been used, no time should be lost in going to a surgeon.

WOODEN PAVEMENTS MADE SUCCESSFUL IN LONDON.

After a sufficient comparative trial, the contest between granite, asphalt, and wood for carriage ways has been decided in favor of the last, and the recent conclusion of the Corporation of London may be regarded as a final confirmation of that decision. Mr. Heywood, engineer for the city, has shown that before a horse falls he may expected to travel on granite 132 miles, on asphalt 191 miles, and on wood 446 miles; and although between the two last materials there is a trifling advantage in the cost on the side of asphalt, that is much more than counterbalanced in other ways. In easy traction and the absence of noise there is no comparison between wood and granite, and since the surface water has been kept out by means of asphalt, wood has become one of the most durable of pavemsnts. The rapidity with which it can be laid and the ease with which it can be repaired are not the least of its merits, while the flooring of planks, which is now laid as a superstructure, gives great elasticity, and, by distributing the weight equally over the whole pavement, adds to its power of endurance.

A POINT OF PATENT LAW.

A curious addition to our patent law authorities has just been made by a decision of the Master of the Rolls. This decision was based upon a proposition which appears to he well established, namely, that an application for a patent may be kept on foot by the deposit of a second provisional specification before the determination of the period of protection afforded upon the first application. Some time ago a patent was applied for by Mr. Thomas Melling, of Liverpool, in respect of certain improvements relating to water supply. He subsequently was desirous of renewing his application, and to be successful it was necessary that the fresh application should be made not later than the 20th May last. In consequence, however. of certain informalities in the papers, and the necessity for a reference by Mr. Melling's agent to that gentlemen himself, it was not perfected until the 22nd, and consequently after the period of protection upon his previous application had run out. To remedy the defect, which would otherwise have been fatal, the Master of the Rolls was moved to allow the application to be dated as of the 20th, or two days earlier than the actual date; and to this the Master of the Rolls has consented. We confess we are quite at a loss to understand upon what authority the Master of the Rolls has proceeded. Presumably, he decided the point in his capacity of Commissioner of Patents, but even then we fail to perceive how in the face of seetions 6 and 23 of the Act of 1852, he could exercise any such authority. The Act is clear in requiring the date of the application to be recorded, and while it allows the patent to be dated as of any time between application and sealing, it is careful in restricting the exercise of the power to that interval. The effect of this decision will be that, assuming the letters patent to be sealed and to bear date as of the recorded day of appplication, that date will be two days prior to the actual date; and as a still further consequence, the invention, which was by the delay of the applicant given to the public, is now withdrawn from it and restored to Mr. Melling. It may be mentioned that, as Sunday intervened between the 20th and 22nd ult., there was in this case no occasion to alter the number. This is the first decision in favour of such an application, but we may also mention the fact that some years ago an application of a similar kind was made by petition to the Lord Chancellor, and wes returned endorsed to the effect that there was no jurisdiction to make the order prayed.

NOT AT ALL STRANGE.—A man in Wyoming, Ohio, upon opening his chicken-house lately in the morning, missed two birds; but then, on the other hand, he found two fingers in the trap. They haven't been called for.

A CURIOUS JAPANESE COMPASS.

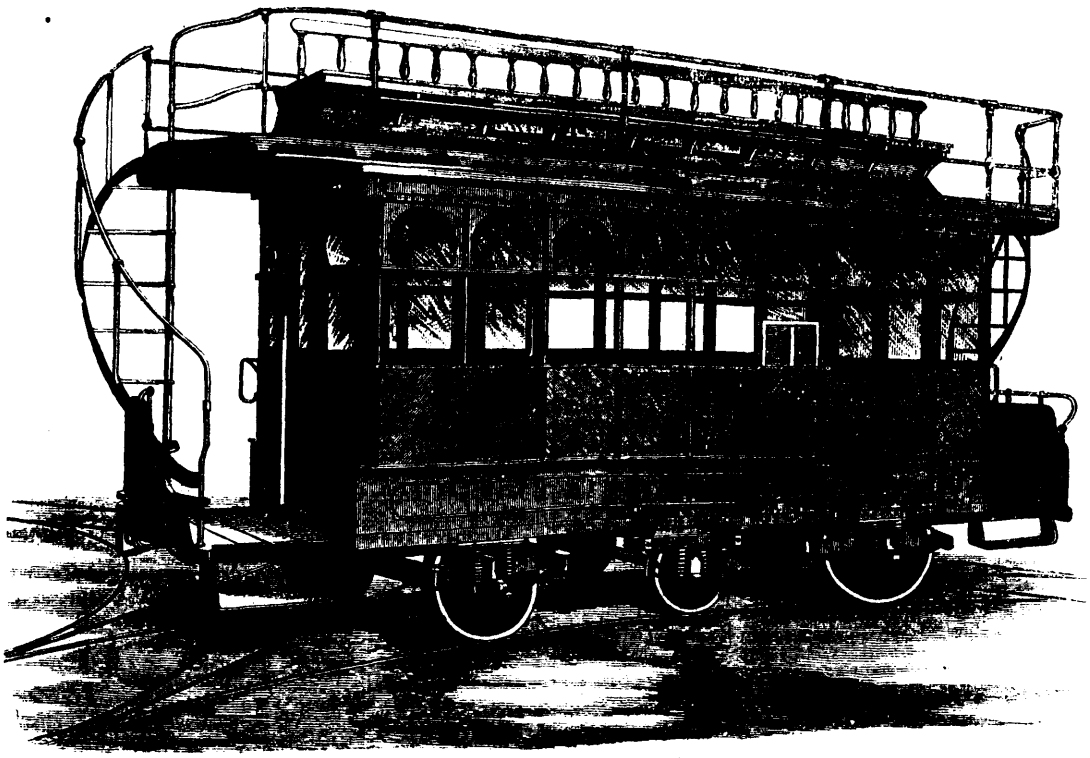
In a recent number of *Land and Water*, Mr. Frank Buckland draws attention to a remarkable compass which Captain J. H. Murray, of the screw steamship Scaresbrook, obtained from a Japanese pilot at Yokohama, in 1874. This compass had been taken out of the wreck of a junk which had been lost on the island of Vries, a volcanic island at the entrance of the Yokohama Bay, the smoke of which, with the snow-capped peak of Fusiyama (the sacred monntain of Japan, or the mountain of Fire—mana, a hill; fusi, fire) indicates the entrance to the harbour. The pilot could give no information about the compass, except that it was found on board the wreck. It is of a circular form, measuring 13½in. across, cast in bronze, and weighs 21lb. It has a thick rim, in which two ordinary compasses are set, one on each side. The centre of this remarkable plate-like looking object is considerably raised from the surface, and is covered with a number of raised spots or stars of various sizes, each more or less connected by lines with its neighbours. The shapes of these star-like objects are remarkable; in the centre there are five which are larger than the rest. Then there is another group like a net; another group represents almost a complete circle of these stars; another represents a Y with the arms closed together; another a Y with the arms extended. Altogether, there are no less than two or three hundred of these elevated spots of different sizes. Running throughout the whole series are several lines radiating from a circle drawn round the centre. The brass rim on which the compasses are set is divided into 360 degrees, the same as an English compass. At every thirty degrees there is a Japanese character. Neither Captain Murray, nor any one to whom he has shown this curiosity at home or abroad, has any idea whatever of the meaning of the star-like bodies in the centre, or for what purpose the Japanese used them; but it is quite certain that it must have been of some use to them. It is most interesting that these rude characters should be united in the same instrument with the 360 degrees of modern civilization. The casting of this remarkable instrument is very marvellous. An optician who cleaned it up for Captain Murray, in Glasgow, said he had never seen a finer bit of work. Mr. Buckland proposes to exhibit this compass in his museum at South Kensington, and to call the notice of some of the gentlemen connected with the Scientific Loan Exhibition, who are learned in astronomy, to its nature, and if possible, get an explanation of its use in Japanese navigation.

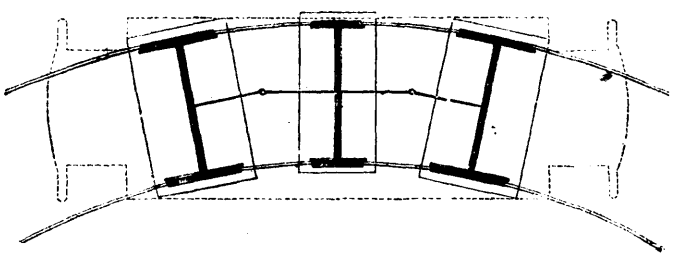
STATISTICS OF LABOUR—There are said to be in the United States 252,148 manufacturing establishments, employing 2,053,996 hands, and producing annually $4,232,324,445 worth of goods. There are 40,191 steam-engines, 51,018 water-wheels, with a combined force of 2,346,135 horse-power.

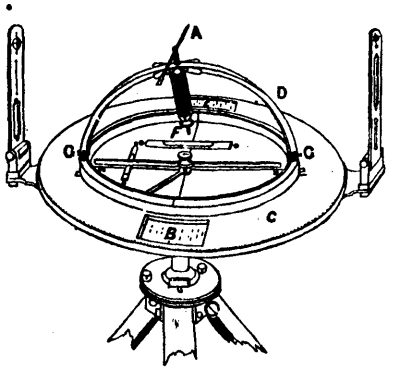
FAILURES IN AMERICA.—A list compiled by Messrs. Dunn and Barlow, of the Mercantile Agency, and published in New York, shows that in the first half of the present year there were as many as 4600 failures in the United States, the total liabilities reaching 108,415,420 dols., and in Canada there were 858 failures, with liabilities amounting to 12,694,236 dols. Compared with the corresponding half of last year, the number of failures in the United States shows an increase of 1037, and the amount of liabilities an increase of 31,572,163. But the United States return has this favourable feature, that in the year 1876 the number of failures in the second quarter were fewer by a thousand than in the first, and the liabilities were less by 21,000,000 dols., and a like result is shown also in Canada, encouraging the hope that the worst is past.

PAPER BLANKETS.—A suggestion, says the *British Mail*, that has frequently been made in the newspapers that a sheet of brown paper used as a bed-covering between or on the top of other wrappers, will impart additional warmth and be as serviceable as a blanket, has been acted upon by a Mr. Loder, who has taken out a patent for paper blankets. They are perforated at distances of about four inches, in order to promote the ventilation which the density of the brown paper material interrupts. These paper blankets will be a great boon to the poor, and as they are clean, economical, and ready for use in any emergency, they will be acceptable in hospitals, for the supply of which Mr. Loder has already obtained two or three contracts. In schools and private families their cleanliness and comfort will bring them into much service, and in hot climates, where blankets are liable to be infested with insects, these paper coverlets will be found to be very desirable. They will also be welcome for being light as well as efficient. The price for a blanket 48 by 33 in. is 4*d.*, and the larger sizes 5*d.* and 6*d.* each.

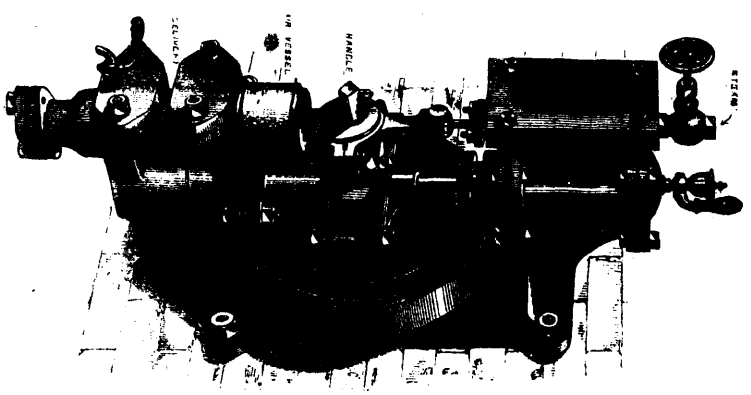
IMPROVED TRAMWAY CARS.



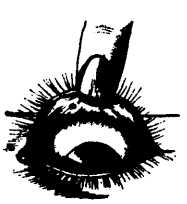




DAVIS & COCHRANE'S MINING DIAL.



SELF-RELIANCE PUMP.



FOREIGN BODIES IN THE EYE.

THE FAMILY FRIEND.

This part of the MAGAZINE, for the future, will be devoted to instructive domestic reading for the *Home Circle*, such as SHORT PLEASING STORIES, DRAWING, MUSIC, BOTANY, NATURAL HISTORY, POPULAR GAMES, and amusements for boys and girls, NEEDLE WORK, AMATEUR MECHANICAL PURSUITS, and all the elements of a *practical domestic education ;* also GARDENING and AGRICULTURAL NOTES.

FLORAL CULTURE.

BALSAM. Nat. Ord. Balsaminaceæ. *Linn.—Pentandria Monogynia.* Magnificient conservatory or out-door plants, producing their gorgeous masses of beautiful brilliant colored flowers in the greatest profusion ; when grown in pots, and large specimens are desired, they should be shifted into 10 or 12-inch pots, using the richest and freest compost at command, and the pots plunged in a moderate hotbed and liberally supplied with manure water ; when for out-door decoration the soil should be of the richest possible character, the plants should be set fifteen inches apart, securely staked, and receive frequent waterings of manure water.

CANDYTUFT (Iberis). Nat. Ord. Cruciferæ. *Linn — Tetradynamia Siliculosa.* One of the most useful border annuals, very effective in beds, group, ribbons, etc., also very useful for pot culture, for conservatory decoration during winter ; indispensable for bouquets.

CHRYSANTHEMUM. Nat. Ord. Compositæ. *Linn.—Syngenesia Polygamia Superflua.* The tall, double flowered Chrysanthemums, when well grown, are amongst the most showy and effective of summer flowering border plants ; to allow for individual development, they should be thinned out to from twelve to eighteen inches apart ; they are also very effective in large pots for placing about terraces. The dwarf kinds make showy bedding plants ; C. tricolor burridgeanum and C. tricolor venustum are very handsome ; these should be thinned out to one foot apart.

CANTERBURY BELLS (Campanula Medium). Nat. Ord. Campanulaceæ. *Linn.—Pentandria Monogynia.* When well grown Canterbury Bells are amongst the most attractive of border plants, and they are also very effective when flowered in large pots ; they succeed in light, rich soil, and should be transplanted two feet apart. See new varieties under Campanula, Nos. 250 and 251. *Hardy Biennials.*

BALSAM SOLFERINO.

CANDYTUFT (Fragrant.)

COCKSCOMB.

BALSAM CARNATION STRIPED.

BALSAM (Camellia-Flowered.)

CHELONE BARBATA.

CENTAURIDIUM DRUMMONDII.

CANTERBURY BELLS.

CLARKIA ELEGANS.

CALLIOPSIS or COREOPSIS. Nat. Ord. Compositæ. *Linn.—Syngenesia Polygamia Frustranea.* Few, if any, annuals are more useful than these; the colors are rich and striking, flowers numerous and beautiful; the dwarf varieties make splendid edgings and fine bedding plants, the tall produce a fine effect in mixed borders. *Hardy annuals.*

CLARKIA. Nat. Ord. Onagraceæ. *Linn.—Octandria Monogynia.* Among the most desirable annuals for bedding purposes, growing freely and blossoming profusely in almost any common garden soil. It has undergone great improvement since its first introduction. Its flowers are much larger, which, combined with their brilliant colors, profusion of bloom and fine habit, makes it indispensable to the flower border. The Tom Thumb varieties make fine compact beds and long marginal lines. Plants from seed sown in September will bloom early the following spring. *Hardy annuals.*

EXPERIMENTAL INSTRUMENTS.

INVISIBLE INKS.—*Red*—To the pure spirit of vitriol or nitre add eight times as much water. *Green*—Dissolve salts of tartar, clear and dry, in a sufficient quantity of river water. *Violet*—Express the juice of lemons, and keep it in a bottle well corked. *Grey*—Mix alum with lemon juice. The letters written with this ink will be invisible till dipped in water. *Yellow*—Steep marigold flowers seven or eight days in clear distilled vinegar; press the flowers and strain the vinegar, which is to be kept in a bottle well corked. To make the characters visible which you write with these inks, pass a sponge over the paper, dipped in the following solution:—Take a quantity of pansy, or common violet flowers, bruise them in a mortar with water, strain the liquor in a cloth, and keep it in a bottle. The following are the most common invisible inks:—Sulphate of copper and sal ammoniac, equal parts, dissolved in water; writes colourless, but turns yellow when heated. A weak infusion of galls; turns black when moistened with weak copperas water. A weak solution of sulphate of iron; turns blue when moistened with a weak solution of prussiate of potash, and black with infusion of galls. The diluted solutions of nitrate of silver and terchloride of gold darken when exposed to the sunlight. Aquafortis, spirits of salts, oil vitriol, and saltpetre, dissolved in a large quantity of water, turns yellow or brown when heated. Solution of acetate of cobalt, to which a little nitre has beed added, becomes rose-coloured when heated, and disappears on cooling. Solution of nitromuriate of cobalt turns green when heated, and disappears again on cooling.

TO MAKE WATER FREEZE BY THE FIRESIDE.—This curious feat can only be performed in winter. Get a quart pot upon a stool before the fire, throwing a little water upon the stool first. Then put a handful of snow into the pot, having privately conveyed into it a handful of salt. Stir it for about eight minutes with a short stick, and the congelation will be effected.

AN ARTIFICIAL SPIDER WHICH MOVES BY ELECTRICITY.—Take a piece of burnt cork as big as a pea; give it the shape of a spider; make its legs with threads of hemp; put a grain of lead into the cork to give it some weight; then hang this artificial spider by a bit of grey sewing silk (that is, not twisted) between two bodies endowed with different electricities. It will go and come between these bodies, and the movement of the legs will be seen as plain as if it were a living spider.

THE LEAD TREE.—Put half an ounce of the best sugar of lead, in powder, into a clear glass globe or wine decanter, filled to the bottom of the neck with distilled water and ten drops of nitric acid, and shake the mixture well. Prepare a rod of zinc with a hammer and file, so that it may be a quarter of an inch thick and one inch long; at the same time form notches in each side for a thread, by which it is to be suspended, and tie the thread so that the knot shall be uppermost when the metal hangs quite perpendicular. When it is tied, pass the two ends of the thread through a perforation in the cork, and let them be again tied over a small splinter of wood, which may pass between them and the cork. When the string is tied, let the length between the cork and the zinc be such that the precipitant (the zinc) may be at equal distances from the sides, bottom, and top of the vessel when immersed in it. When all things are thus prepared, put the vessel in a place where it may not be disturbed, and introduce the zinc, at the same time fitting the cork. The metal will very soon be covered with the lead, which it precipitates from the solution, and this will continue to take place until the whole be precipitated upon the zinc, which will assume the form or shape of a tree or bush, the leaves and branches of which are laminal or plates of a metallic lustre.

MANAGEMENT OF PET AND COMPANION DOGS.

FEEDING.

Where only one or two small dogs are kept, there is often sufficient refuse to keep them with the addition of a little meat or plain biscuit, and the greatest danger to dogs so fed is that their diet may be too rich; this should be avoided, as well as all bits between regular meals. When puppies are weaned, cows' milk shonld be given, if procurable, at least once a day. I often hear it stated, and see it in print, that milk should be boiled, because if given in its natural state it produces worms. I have never seen any attempt to prove this by the asserters, and until I have very strong proof of it offered to me, I must continue to think it nonsense. We do not boil the milk we use ourselves, nor for the thousands of babies that nowadays depend on the cow for ailment—calves do not have their milk boiled, and yet we do not find them suffering from worms. In warm weather, if milk is brought up to the boiling point, called in some parts "scalding it," it will keep much longer sweet, and when boiling or hot milk is poured over bread or biscuit, and allowed to cool, it makes a nicer dish for the dog, as it more thoroughly soaks the biscuit; but, boiled or unboiled, I do not believe it has anything to do with the production of worms, and that to attribute their existence to such a cause is merely a cloak for our ignorance.

Flesh is the food for dogs in his natural state, and in his domesticated state he still shows a preference for it, and dogs cannot be brought to the highest condition without it. Except as an occasional treat, all flesh should be cooked. A writer who has had very great experience with dogs, recommends that they should have the meat thrown on the ground to them, on the plea that a certain amount of dirt is necessary as an aid to digestion. I find I can keep dogs in perfect health without such a questionable digestive, and not being a believer in dirt, inside or out, I cannot recommend the practice. I am aware that dogs will bury their bones and meat in the ground, and afterwards dig it up and eat dirt and all, just as I am aware that most of them prefer flesh that is putrid to that which is fresh and good; but I see no reason for indulging them in either propensity, whilst considering their relation to man, there are strong reasons against the latter. Horse flesh is very suitable for dogs, as is also mutton, and sheeps' heads, and trotters, with other butcher's offal makes excellent broth. Buffalo beef, which is dried and pressed into blocks, and quite free from salt, is a capital and very cheap food for dogs. It can be bought for about 15s. per cwt.; it is very sweet and clean, and will of course keep any length of time, and I have found dogs very fond of it. Paunch and tripe form excellent food for dogs, besides being cheap, and dogs are remarkably fond of it, some feed entirely on it, and give it raw, I prefer boiling and pouring the broth over bread or plain biscuit, or boiling meat in it to thicken it. Boiled liver may conveniently be given now and then, as it has a laxative effect and renders the dose of physic unnecessary. It is scarcely necessary to warn against giving diseased meat, especially in a raw state; "measly" pork, for instance, is sure to develope tape worm. I must also warn against the use of salt meat, or the broth in which it has been boiled. Salt, except in the very smallest quantities, is a poison to the dog. In a book before me I find it stated, "Dogs that are kept from meat are less liable to distemper and fits." I have seen nothing in my experience confirmatory of this statement, and I believe it to be as groundless as the other assertion, that milk produces worms. I see Liebig's extract of meat recommended as a food, but it is a misnomer to call it so. It is a stimulant, not a food in the ordinary sense of the word, and belongs to the hospital dietary, not ordinary feeding. Bone dust, too, is ordered as a novelty in dog diet, but that is not the form to give bones, which are, if not absolutely essential to health, at least a great aid to it. We can only profit by Nature by obeying her laws. She has furnished the dog with teeth and powerful jaws that enable him to break up bones of considerable size. He shows such fondness for them that "Give the dog a bone" is a proverb. What proof have we that we are assisting nature by reducing the bones to powder? I know of none, and prefer to keep the old ways till the new is proved, or give strong promise of being better. Large bones should be given tolerably "rough;" the dog will like them the better and they act as a toothbrush. The argument against giving bones—except fish bones—that the dog is liable to be choked by them, is not worth considering. Of the vast number of dogs that exist, and the immense number of bones each dog in his life consumes, how many, or rather how few, cases of choking are there? Where more than one dog is fed together, it is better to withhold the

bones till the other portion of the meal is finished, to prevent quarrelling; then give each his portion.

Of the farinaceous food for dogs I consider oatmeal the best; but it is dear. I have for years used a mixture of oatmeal two parts, Indian meal and barley meal each one part, and found it answer very well; but now that wheat and barley have changed places in the market, I would substitute coarse wheaten flour. This is a meal made from dari that is sold cheap as a dog meal, but I do not consider it very nutritive. Rice or rice meal is sometimes given, but I would warn my readers that between rice and the ricemeal of commerce there is a vast difference, and I consider the latter only fit for store pigs. Rice may be given occasionally, and is often useful in sickness. Whatever meal is used I consider it enhances its value as a food, and is true economy, to boil it well until it forms a stiff pudding. This need not be done every day, it will keep sweet some days, according to the weather, and a portion of it taken out and the warm broth from the meat poured over and the meat cut into pieces, mixed with it. Boiled green vegetables at least twice a week are necessary for health. They prevent jaundice, skin diseases, and inflammatory disorders; if not sufficient left from the table, boil them in the meat broth. Potatoes, cabbage, broccoli, carrots, turnips, are all useful, and often of the greatest benefit.

Dogs differ in their tastes, habits, and constitutions; some refuse food that others show great partiality for; an article of diet on which one thrives will disagree with another, and these are things the owner should observe and guide himself by in the feeding of his dogs. I can only suggest general rules, from which there will arise special reasons for departing in special cases. To sum up, feed regularly, do not give bits between meals, avoid salt, sugar, sweet cakes and puddings, feed in clean dishes; do not leave a portion of food in the trough from one meal to another, it may ferment and set up diarrhœa; give variety of food, and don't give it too rich, or too much of it, for that, with insufficient work or exercise, will produce obesity, which not only robs the dog of much of the pleasures of life, but brings in its train a host of diseases. I had almost forgotten to refer to the great staple dog food of the day, the "meat biscuits" so much in vogue. No one can dispute these being most convenient in form, very clean, and save a world of trouble. I have used both Spratt's Patent and Clark's Buffalo meat biscuits, and I think very highly of both. I have given them both dry and soaked, according as the dogs preferred them; and whilst I can recommend them as a wholesome diet, that may be used as a staple food, they do not do away with the necessity of variety, especially for green vegetables, more particularly in dogs that are confined and kept in town.—*Young Fancier's Guide.*

BUTTER-MAKING IN SUMMER.

The following plan, though simple, may not be generally known, for obtaining good butter in warm weather:—When ready to churn, rinse the churn out with cold water as usual, and mix with the cream its own quantity of fresh-drawn cold water—that is to say, for every quart of cream mix it with a quart of cold water. When this is stirred together it will be about the same consistence as cream in cold weather; it will then easily pass through the strainer into the churn. Churn it slowly, as customary at this season. It should be about an hour in coming, and will be nearly as stiff as it is in winter, and may be immediately made up. At the latter end of May or the beginning of June, when the butter begins to be soft, commence by mixing a little water, and gradually increase the quantity as hot weather comes on, until at this season it requires the quantity as described above. As cooler weather comes in August and September, gradually diminish the quantity of water, and finally abandon it when no longer required. By this means good stiff butter may be obtained during the hottest part of the season.—*English Mechanic.*

Glass Fern Cases.— The soil should be about four inches deep. From May to end of September you can give a little water every alternate month; from September to April you need not open your case except to clean the glass. Do not water when your glass is covered with moisture.

Either Side.—An Irishman's love of fun and fighting is proverbial. On one occasion an Irishman happened to come up to a faction fight, and feeling it impossible to restrain his desire to mix in the *mêlée*, he rushed into the midst. Hitting right and left with his shillelah, he cried, "The Lord direct me to the right side?"

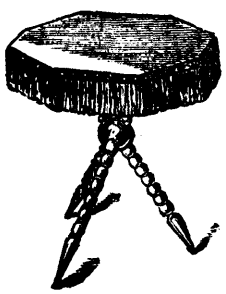
Things Worth Knowing.—*Anti-friction grease:* Tallow, 100 lbs.; palm oil, 70 lbs.; boil together; when cooled to 80°, strain through a sieve, and mix with 28 lbs. soda and 2½ gals. water. For winter take 25 lbs. more oil in place of the tallow. *Another:* Pulverized black lead, 1 part; lard, 4 parts, mix. *Booth's stairway Axle grease:* Water, 1 gal.; clean tallow, 3 lbs., palm oil, 6 lbs. common soda, ½ lb. or tallow 10 lbs., palm oil, 10 lbs. Heat to about 212°, and stir well until it cools to 70°. *To remove Old Iron moulds:* Moisten the part stained with ink, remove this by the use of muriatic acid diluted by five or six times its weight of water, when the old and new stains will be removed. *Whitewash for outside work:* Slack lime, ½ bushel, in a barrel; add common salt 1 lb., sulphate of zinc, ½ lb., sweet milk, 1 gal.; bring to a proper consistence with water, and apply with a whitewash brush. *Asphalt composition:* Mineral pitch, 1 part; bitumen 11 parts; powdered stone or wood ashes, 7 parts. *Composition for streets and roads:* Bitumen, 16.875 parts; asphaltum, 225 parts; oil of resin, 6·2 parts and sand 1·35. Thickness from 1¼ to 1⅝ inches. Asphaltum, 55 lbs., and gravel, 23·7 lbs. will cover an area of 10·75 square feet. *Cement for external use:* Ashes, 2 parts: clay, 3 parts; sand, 1 part mix with a little oil, very durable. *Cement for Shoemakers and Channelers.* India rubber dissolved to a proper consistency in sulphuric ether. *Mortar:* Lime, 1 part; clean sharp sand, 2½ parts. An excess of water in slacking the lime swells the mortar, which remains light and porous, or shrinks in drying: an excess of sand destroys the cohesive properties of the mass. *Stone mortar:* Cement, 8 parts; lime, 3 parts, and 31 parts of sand. *Brown mortar:* Lime, 1 part; sand, 2 parts, and a small quantity of hair. *Brick mortar:* Cement, 8 parts; lime, 3 parts; sand, 27 parts. Lime and sand, and cement and sand, lessen about one half in volume when mixed together. *Turkish mortar:* Powdered brick and tiles, 1 part; fine sifted lime, 2 parts; mix to a proper consistency with water, and lay on layers of five or six inches thick between the courses of brick or stone, being useful on massive or very solid buildings.

Lenoir's process of silvering mirrors, which has recently been very favourably reported upon by a committee of the Société d'Encouragement, is described as follows:—He flows on the surface of the glass to be silvered solutions of nitrate of silver and tartaric acid, by the interaction of which a deposition of metallic silver is effected. In twenty minutes the deposition of silver commences, and within an hour it is complete. He then washes the silvered surface with distilled water, and sprinkles over it a dilute solution of the double cyanide of mercury and potassium, the effect of which is to liberate a portion of the silver, and to form with the balance a very white and strongly adherent amalgam of mercury and silver. The surplus liquid is then poured off, the surface is washed, dried, and finally coated with varnish to protect it from destruction by friction.

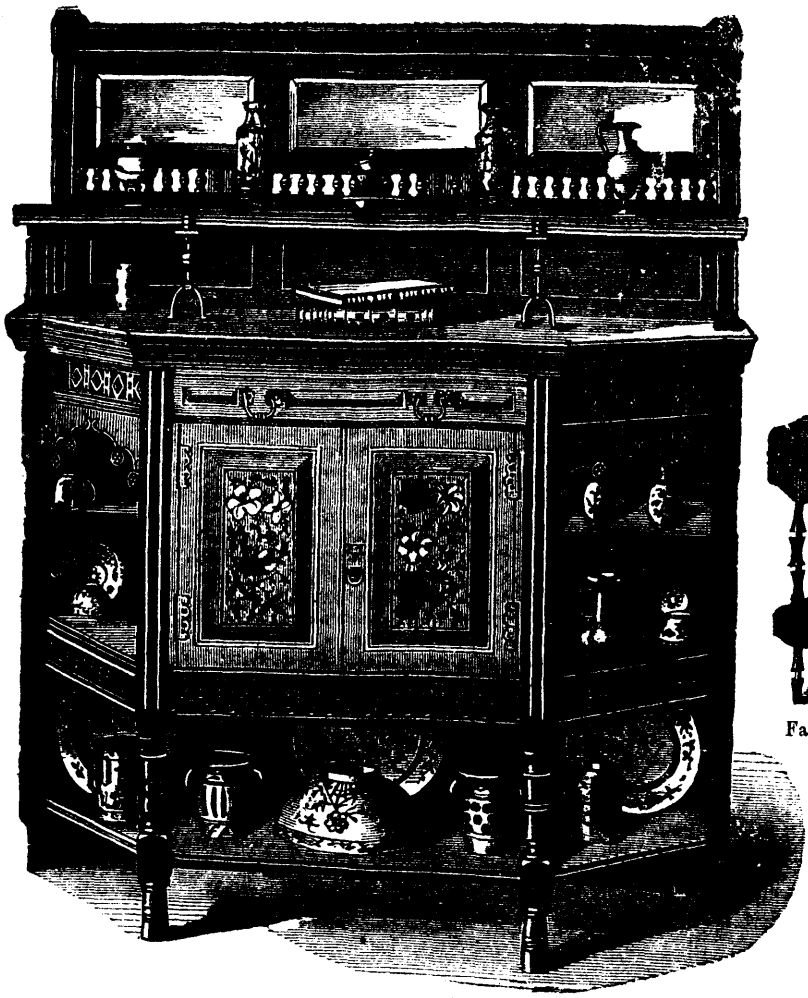
Prof. Böttger recommends the following as the simplest method of giving paper and wood surfaces a crystalline coating:—Mix a very concentrated cold solution of salt with dextrine, and lay the thinness possible coating of fluid on the surface to be covered by means of a broad, soft brush. After drying, the surface has a beautiful, bright mother-of-pearl coating, which, in consequence of the dextrine, adheres firmly to paper and wood. The coating may be made adhesive to glass by doing it over with an alcoholic shellac solution. The following salts are mentioned as adapted to produce the most beautiful crystalline coating, viz: sulphate of magnesia, acetate of soda, and sulphate of tin. Paper must first be sized, otherwise it will absorb the liquid and prevent the formation of crystals. Coloured glass thus prepared gives a good effect by transmitted light.

Crystallized Wood and Paper.—According to Professor Bottger, the simplest method of giving paper and wood surfaces a crystalline coating is as follows: Mix a very concentrated cold solution of salt with dextrine, and lay the thinnest possible coating of the fluid on the surface to be covered, by means of a broad soft brush. After drying, the surface has a beautiful mother-of-pearl coating, which, in consequence of the dextrine, adheres firmly to paper and wood. The coating may be made adhesive to glass by doing it over with an alcoholic shellac solution. Prof. Bottger mentions the following salts as adapted to produce the most beautiful crystalline coating: sulphate of magnesia, acetate of soda, and sulphate of tin. Paper must first be sized, otherwise it will absorb the fluid and prevent the formation of crystal on its surface. Visiting cards, with a mother-of-pearl coating, have for some time been in use. Colored glass is well adapted for such a coating, which has a good effect when the light shines through.

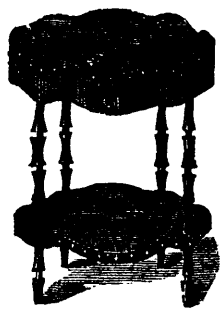
FURNITURE DESIGNS.



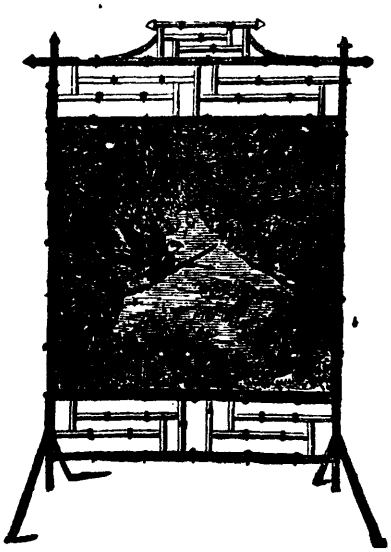
Walnut Gipsy Table.



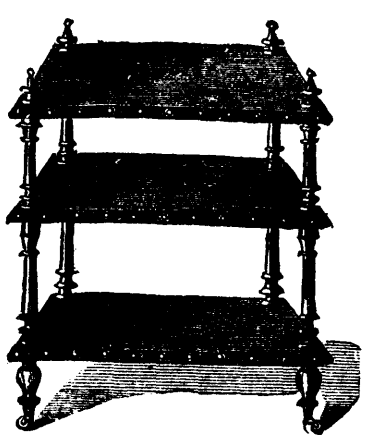
Very handsome 5 feet black Early English Cabinet, with drawer and cupboard, inclosed by two beautifully painted doors... ... ...



Fancy Gipsy Table.



Japanese Screen, with cretonne on both sides.



Handsome black and gold 3-tier Whatnot, with shelves covered in any colour cloth.

HOMELESS.—(A COPY FROM THE "ART JOURNAL.")

THE BIRDS OF PARADISE

(See page 313.)

(*Paradiseæ*) are magnificent ravens, varying in their size from that of a jay to that of a lark, and are distinguished not only by the exquisite beauty of their feathers, but by the elegance of their shape. In this family the beak is of moderate size, straight, or slightly curved, compressed at its sides, and covered at the base with a feathered skin, by which the nostrils are concealed; the wings are of moderate length, and very decidedly rounded, as the sixth aud seventh quills are much longer than the rest; the tail is either composed of twelve rather long feathers, combined with many thread-like feathery appendages of great length, or is extremely long, simple in form, and sharply graduated; the feet are powerful, the toes long, and armed with sharp, crooked claws. In some species the plumage upon the sides is most peculiar in its appearance, the feathers growing to a great length, and splitting, as it were, into several light and delicate portions. These peculiarities are only observable in the male, both the female and young being much more simply clad. The birds of paradise are found exclusively in New Guinea and the neighbouring islands, Arnisland, Salawati Meisol, and Waigiou, each of these localities possessing one or more distinct species.

Rosenberg has given us the following description of the manner in which the natives prepare these valuable creatures for the European and other markets:—The Papuans shoot the bird of paradise with arrows, and then strip the body of its skin, cut away the feet and a portion of the tail-feathers; they then insert a stick through the beek, and thus supported the skin is hung to dry in the smoke of a wood fire in order to preserve it from the attacks of vermin. The natives of Meisol, on the contrary, do not remove the feet or any portion of the tail, as they have learnt by experience that the unmutilated skins command the highest price. These skins are bought by merchants from Madagascar, Teimate, and Eastern Seram, and conveyed to Singapore, from whence they are forwarded to Europe or China. According to information received from these merchants the finest birds come from the northern coast of New Guinea, the Sultan of Tidore reserving annually a certain number of the skins obtained within his territory as tribute.

IMPROVED LUBRICATING COMPOUND.

An improved lubricating oil or compound has been patented by Mr. C. H. Green, of New York, which, as far as can be understood from the specification furnished by the patentee, is a compound of oil obtained from the feet of cattle, and of paraffin or petroleum oil. It is found, says the patentee, that certain oleaginous secretions, or matter obtained by boiling from the joints, feet, and other parts of animals, when mixed with animal and other oils or fluid, can be used to great advantage for lubricating machinery and for other purposes. The said oleaginous secretions or matters are successfully extracted in the following manner:—A quantity of cattle feet and other parts of the animal are put into a clean cauldron, with sufficient water to cover the said matter, and boiled at a temperature of 240° Fahrenheit, until the flesh and gristle separate from the bone, which will require about tour hours. The neat's-foot oil given out by the boiling will float on the surface, and may be skimmed off if desired, but otherwise it may be left; the bones are then removed, as they may be useful for many purposes in the arts. At this stage of the process the matter which it is desired to mix with the oil, for lubricating or other purposes, is in a suitable condition to receive the oil to be mixed with it. Whatever the material in question may be, it is believed that it is either the synovial fluid known to anatomists, or that that fluid forms an important if not the principal part; and although the neat's foot is not necessary to the compound which it is desired to produce, its presence in the compound or preparation will not be injurious. —*English Mechanic.*

LOVE IS LIFE.—Love is life. Selfishness is death. Think of one who has no throb outside of himself: is he not entombed in a grave darker than that of earth? The moment one begins to love, if only a dog, he begins to live. To love something that is different from one's self—a flower, a star, a human soul—what is in it, what stir of all the faculties! Oh, the manifold life of love! How it flows and streams away on every side, in love of father and mother, sister and brother, husband and wife, friend and little children, of the tiniest speck and grandest orb. We rejoice in all things. The very worm beneath our feet thrills us. We are alive all over.

NOTES AND MEMORANDA.

THE easiest way to burn stumps of trees is to use a sheet iron chimney, big enough in diameter to fit over the largest stump, and some six feet in height. An opening near the bottom answers for a door. The stump should be set on fire by placing around it some kindling wood inside the chimney, and the latter will produce a draught which will materially hasten the burning of the wood.

ACCORDING to Mr. Gobley, the following is the chemical composition of the brain:—1. The cerebral matter of the brain of man contains eighty per cent. of water. 2. It contains two albuminous substances, one soluble in water and resembling albumen, the other insoluble in water, and for which the author proposes the name cephaline. 3. The fatty matter of the brain is formed chiefly of cholesterine, lecithine, and cerebrine; it contains also traces of olien and margarin. 4. The brain contains the usual salts and extractive matters of the animal economy, of which a part are soluble in water and alcohol, and a part are soluble in water but insoluble in alcohol. 5. During putrefaction the cerebral pulp furnishes various products, among which are found oleic, margaric, butyric, glyceric, and phosphoric acids.

MINUTENESS OF ATOMS.—Goldbeaters by hammering, can reduce gold to leaves so thin, that 283,000 must be laid upon each other to produce the thickness of an inch; yet those leaves are perfect, or without holes, so that one of them laid on any surface as in gilding, gives the appearance of solid gold. They are so thin, that if formed into a book, 1,400 would only occupy the space of a single leaf of common paper; and an octavo volume of an inch thick would have as many pages as the books of a well stocked ordinary library of1, 400 volumes, with four hundred pages each.

Still thinner this is the coating of gold on the silver wire of what is called gold lace; and we are not sure but that such coating is only one atom thick. Platinum and silver can be drawn into wire much finer than human hair. A grain of blue vitriol or carmine will tinge a gallon of water, so that in every drop the colour may be perceived. In the milt of a cod fish, or in water in which certain vegetables have been infused, the microscope discovers animalcules of which many thousands together do not equal in bulk a grain of sand; and yet nature, with a singular prodigality, has supplied many of these with organs as complex as those of a whale or elephant; and their bodies consist of the same substances, or ultimate atoms, as that of a man himself. In a single pound of such matter there is more living creatures than of human beings on the face of this globe.

A NEW SAFETY BLASTING POWDER.—A company whose manufacturing works are located at Glyn Ceirog, Llangollen, have just introduced a new safety powder for blasting purposes. The advantages claimed for the new explosive are that it is 20 per cent. cheaper than ordinary "black" powder, though its charge is twice as powerful as the latter; that it is perfectly safe, and unaffected by concussion, except the blow be a very heavy one; that its use is attended by little or no smoke; and that it is convenient in its application, and may be fired with the ordinary fuse. Made up into cartridges of various sizes, from $\frac{1}{2}$ths of an inch to 3 inches in diameter, the powder resembles "touchwood," which is accounted for by the fact that the principal material used for its preparation is a woody pulp, which may be obtained from bamboo or other fibrous plants. The pulp having been throughly washed and dried, is soaked in nitric and sulphuric acids, with a little chlorate of potash. After a second washing, with the object of getting rid of all the free acid, the material is put through powerful hydraulic presses, by which it is formed into cartridges as above described, the last process to which it is submitted being that of drying. Last week several experiments, with a view of testing the properties of the powder, were made in the neighbourhood of Edinburgh. Two of these took place at Dalemeny. There were selected for the first experiment a large horizontal face of freestone, in which a hole had been bored $2\frac{1}{2}$ inches in diameter and 5 feet in depth. Such was the weight and texture of the stone that the overseer of the quarry expressed the opinion that no amount of the black powder would shatter it. The charge of "patent" powder applied was 1 lb in weight and this having been "stemed" with earth in the usual way a common fuse was lighted. The explosion which followed was accompanied by no smoke, and little, if any, smell. The hole having been bored in traiangular shape, the result was that the bed of the stone was cut to a considerable depth in three different directions, leaving the block easily accessile for working.

SILVERING METAL.—Dr. Kayser, of Nuremberg, describes a process for giving a durable silver-like lustre to all descriptions of metal goods. Five parts pure tin, Australian by preference as being almost absolutely pure, are melted with one part copper, and the molten mass granulated in the usual way. The granulation should be rather coarse than fine. The granulated metal is prepared with water and cream of tartar, as free as possible from lime. To 100 grammes of metal about 0·5 gramme of ignited nickel oxide is added, and the object to be treated is laid in the bath. After boiling for a short time the object is covered with a film having the exact appearance of silver, with the advantage of possessing a greater resistance to wear than tin or silver itself. The nickel oxide must of course be renewed from time to time. Copper or brass goods can be silvered without preparation; iron goods need coppering. If to the above bath carbonate of nickel be added, a film is obtained which is richer in nickel and darker in colour. The colour can be deepened from the hue of platinum to a blue black, according to the amount of the nickel salt.

A NEW USE FOR IRON.—One of the most incomprehensible discoveries—if it be true, which is questionable — that we have ever encountered is announced in a recent French journal by M. Massie. He says that the mere introduction of an iron bar in the box in which barley, rice, bran, biscuit, and like farinaceous materials are stored, is sufficient to prevent either the ravages of decay or the attacks of insects. Full details of the experimental investigation are given. An iron bar, three pounds in weight is reputed to have saved 40 gal. of grain; and certain biscuits were preserved for seven months in excellent condition, while others, under like circumstances but without the iron, were totally destroyed by weevils.

PHOSPHOR BRONZE.—Phosphor copper used in the preparation of phosphor bronze, is prepared according to Dr. H. Schwatz, as follows:—A crucible is fettled with a mixture of bone ash, silicic acid and carbon, granulated copper is laid in and covered with a quantity of the fettling mixture, and the whole is fastened down with a cemented cover. Soda and glass can be added to promote fusion. At a fusing heat, the silicic acid acts on the phospate, the phosphoric acid is reduced to phosphor, and this is taken up as freed by the copper. On the occasion of an experiment, 14 parts silicic acid were added to 18 bone ash, and 4 powdered charcoal, 4 parts soda and 4 powdered glass, made up with a little gum water, for lining the crucible; the latter was closed, the copper put in, covered with the mixture and melted at a red heat. The lining mixture was but little incinerated. The copper grains appeared grey red, well run and entirely free from blister. On analysis the copper gave 0·5 to 0·51 per cent phosphorus. Another experiment gave copper with 3·25 per cent. phosphorus, which could be melted with six times its bulk of pure copper, for producing copper bronze.

A GREAT ARMY COOK SHOP.—The German government has just completed an immense establishment at Mayence for preparing provisions for the army in time of war. The main building is more than a thousand feet long, with four extensive wings. A railway branch runs directly into the grounds. Two engines of 1,800 horse power are used to run the machinery. The water is drawn from wells fed by the Rhine, and is pumped up by steam into a reservoir which will hold about 500,000 gallons. When the manufactory is in full work it will be capable of boiling down and condensing 170 oxen per diem, grinding 350 tons of flour, and of making 300,000 loaves of bread. It will also be able to supply enough preserved oats for a day's feeding of the horses belonging to an army corps of 280,000 men. To guard as much as possible against fire, the whole of the buildings, including the roof, are of stone and iron.

FUMIGATING PAPER.—Dip light paper in a solution of alum, strength of alum 1 oz. water 1 pt. Dry thoroughly and on one side spread a mixture of equal parts of gum benzoin, oilbanum, or Peruvian balsam, melt the gums in an earthenware dish and spread with a hot spatula, slips of the paper are held over a light when the odorous matter will be evaporated, the alum preventing the paper from igniting.

DANGEROUS VEILS.—Ladies in travelling at this season of the year frequently wear veils of gauze most commonly light green in color. It appears that the use of these is not wholly safe; as a case has lately been published of a child, in Troy, N.Y., whose face while asleep was covered with a green veil to protect it from flies. The infant managed to get the fabric in its mouth, sucked it, and died shortly afterward, with all the symptoms of poisoning.

LADIES' FANCY WORK.

(See page 312.)

CASE FOR BOOK.

This case may be used to preserve a book in travelling, or a choicely-bound volume in the library. The case may be of cloth or holland, according to taste. It is ornamented with a simple pattern in embroidery in silk of any colour, and is bound with sarcenet ribbon. The back, front, flap, and sides are cut in one piece, and the sides are joined to the back. The case must be cut to the size of the book for which it is intended. It is fastened with a band of elastic, and straps are put on to carry it by.

WORK-BASKET.

MATERIALS: Sarcenet; ribbon to match, 1 inch broad; small pieces of black velvet; fine gold cord; gold thread; gold and chalk beads, &c.

Our model is made of yellow and black cane bars, about 10 inches in diameter, and 8½ inches high. The bottom has a plain silk lining; the rest has a full lining to set in puffs between the bars. The full-puffed lining is drawn together in the middle by a ribbon rosette. The ruche round the basket must correspond with this. A plain lining is also required of cardboard and silk. Straps and pockets are placed inside.

A second lining of full muslin in the cover with a running and cord forms a closed bag. The embroidered drapes on the outside must be arranged according to the size of the basket. Both the appliqués of black velvet must be fastened upon sarcenet of the same colour as the lining with gold cord. The remaining ornamentation is in gold and chalk beads, and long tufted stitches worked with gold cord and gold thread. The scallops are edged with gold cord, and ornamented with bows like the cover.

DESIGN FOR CIGAR-CASE: APPLIQUE EMBROIDERY.

The foundation is of velvet. The design may be cut out of velvet or fine cloth, and is fastened to the foundation with cording-stitch in silk of two colours. The veins of the leaves are worked with fine silk.

WORK-BASKET: TRICOT.

MATERIALS: Cardboard, coloured silk, gray and brown knitting-cotton, yellow filoselle, cord and tassels to match the silk, steel tricot-hook.

Make a chain of 116 stitches with gray cotton.

1st Row: Put the cotton over the hook, one single into the next stitch; repeat, keeping all the stitches on the hook; coming back, pull through two loops together.

2nd Row: The same as first, working the single by taking up the two perpendicular loops of last row.

3rd Row: The same as last.

4th Row: With brown cotton, work in tricot, taking up the two perpendicular loops of last row, draw up a loop; repeat; coming back, with brown, pull through each loop.

5th Row: With gray cotton, put the hook through the centre of perpendicular loops of last row, draw up a loop; repeat; coming back, with brown, pull through each loop.

6th Row: The same as last: coming back, draw through each loop with yellow filoselle.

7th Row: The same as fifth row, putting the cotton over the hook before working each stitch; coming back, pull through two loops together.

8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th Rows: Like the 1st, with gray cotton.

17th, 18th, 19th, 20th Rows: the same as 4th, 5th, 6th, and 7th rows.

21st, 22nd, 23rd Rows: The same as 1st, 2nd, and 3rd rows.

The border edge is made as follows:—

Make a chain sufficiently long to go round the top, and lower edges of the work just finished. Work a row of tricot with the brown cotton; coming back, pull through each loop with yellow filoselle, on each side of this work.

TAXIDERMY FOR PARENTS.—If you want to preserve your children, do not stuff them.

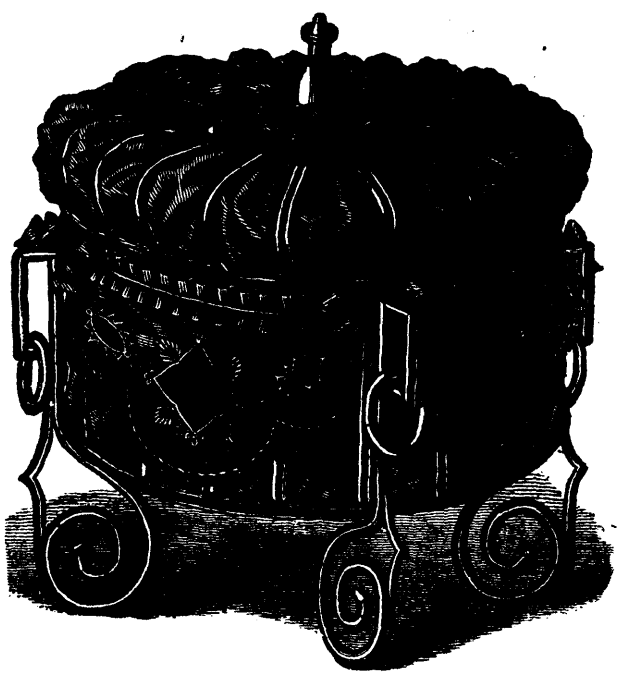
PHILOSOPHY FOR THE TURF.—He who lays wagers lays golden eggs. The goose did so, and you know the consequences.

ADULTERATED COFFEE.——A lover of good coffee, who has been several times swindled, entered a Woodward-avenue grocery recently, and, holding up a handful of ground coffee from the big can, he inquired, "Are there any beans in this coffee?" "No, sir," promptly replied the grocer. "How do you know?" asked the man. "Because I was out of beans and had to put peas in!" was the answer.

LADIES' FANCY WORK.

WORK-BASKET, TRICOT.

FLOWER-POT STAND: CONE WORK.



WORK-BASKET.

CIGAR CASE.

NATURAL HISTORY.

BIRDS OF PARADISE.

BEES AND THEIR INSTITUTIONS.

(See page 316.)

[We extract from a contemporary magazine, entitled *Home and School*, a most excellent educational monthly, published by J. P. Morton & Co., Louisville, Ky., the following article on the instinct and habits of the bee. It is from the pen of a lady, Sophie B. Herrick, who evidently understands her subject; and it is so well written that we forbear to alter or curtail it.—ED.]

It is both curious and interesting to study the government, the laws, the political economy of a kingdom which is precisely the same to-day that it was six thousand years ago; whose antiquity is so great that it enjoyed an ancient rule when China, Assyria, and Persia were still in their infancy. The bees have not only possessed a stable and orderly government through all these centuries, but they have managed to retain their character as models of wisdom, industry, and thrift, while nation after nation has sprung into being, lived its day, and then dwindled away into insignificance.

Many of the lessons which man learns only by bitter experience a thousand times repeated seem to have been stamped by the divine power upon the very entity of the lower creation; and this, if nothing else, would make their habits, instincts, and life history well worth our study.

In every swarm there are three kinds of bees, which not only differ from each other in form and structure, but whose functions are entirely distinct. These are the queen bee, the workers, and the drones (Fig. 1). The queen, who is the only perfect female in the hive, is the mother of the whole swarm. In shape she is easily distinguished from the other bees: her body is long and slender, her wings small but strong and sinewy, her legs are wanting in the brush and pollen basket which characterize the worker, her head is in form a flattened sphere, and her sting is curved. The workers were supposed to be sexless till the delicate dissections of Mdlle. Jurnie, at the suggestion of Huber, determined them to be imperfectly developed females. These are the smallest bees in the hive; their bodies are shorter than that of the queen, their wings of the same size. The four hinder legs are furnished with brushes of stiff hair, with which to collect pollen; the two hindmost with spoon-shaped cavities, in which it is packed away for transportation to the hive (Fig. 2). The head of the worker is triangular, and its sting straight. The drones are the males; in size they are about one third larger than the workers; in form they are thicker, and in color darker. Their jaws and probosces are shorter than those of the common bee; they are destitute of brushes, pollen baskets, and stings, and have heads somewhat similar to the queen.

There is, unless in exceptional cases, only one queen in a swarm; her function is simply to supply her realm with subjects. The workers number from ten thousand to sixty thousand; they perform the whole labor of the hive; they rear the young, defend the common home, stand sentinels at its entrances, collect and store the provisions, elaborate the wax, build the comb, guard, attend, and provide for the queen, and take charge of the sanitary department. The drones perform no work of any kind, and seldom exceed fifteen hundred in an ordinary swarm.

There are two other kinds of bees noticed by apiarians which are frequently found in swarms; these they call the black bee and the captain bee. They both, upon microscopic examination and careful dissection, show an internal structure identical with that of the worker. It seems to be very well established now that the black bee is only a demoralized worker, who having once tasted the sweets of stolen fruits, has abandoned honest labor, and given himself up to pilfering as a profession. Squeezing through small holes in the pursuits of his nefarious business, he has bedaubed himself with honey, and so plastered down and darkened the delicate plumage of his body. The captain bee has probably unintentionally adorned himself with the pollinia of some orchidous plant, and in this way gained the top knot which distinguishes him from his comrades.

The old-fashioned beehives (Fig. 3) were so constructed that the whole internal economy of the colony was a mystery. Nothing of it could be ascertained except in the examination of results after the destruction of the colony.* Though some of the ancients devoted years to the study of the habits of these insects, a large proportion of the results given to the world was almost valueless. Fact was so mixed up with fancy, observation with conjecture, that the value of the whole was greatly impaired. Some of these difficulties have been removed by the introduction of glass observing hives, though many still beset every observer, from the fact that bees love the darkness, and in every way endeavor to obscure their movements within the hive from observation.

We will suppose that we are observing a new hive into which a swarm of bees has been introduced in order that every peculiarity of bee life and work may be considered in their natural order. Before the swarm left the old hive, each bee had gorged itself with honey; beside this provision, a quantity of filled comb is generally supplied to them, so they may not suffer in their new home.

Before anything else can be done, comb must be built. A number of the workers, therefore, fill themselves with honey and suspend themselves in festoons or curtains (Fig. 4), and there they remain motionless for about twenty-four hours. At the end of that time, in the little depressions on the under side of the abdomen, between the overlapping rings of the body (Fig. 5), will be seen thin scales of pure white wax. It is a kind of external fat secreted by the bee from the honey it has assimilated much as the fat of animals is secreted, especially from saccharine food. Some of these scales are solid wax, others thin films, and others again only delicate spiculæ. Bees, like the higher animals, do not all secrete the same amount of fatty matter from a given quantity of food.

The bees loosen themselves, and one of their number, using the pincers at the joint of one of its third pair of limbs, seizes a wax scale from its own body and brings it to its mouth. The scale is turned about in every direction by the claws, and its edge is broken down and off by the mouth of the bee. These particles are then accumulated in the hollows of the mandibles, from which it issues in the form of a very narrow ribbon. The tongue, during this operation, assumes a great variety of shapes, being sometimes flattened like a trowel and again pointed like a pencil. After the tongue has imbued the whole ribbon with a frothy saliva, which gives to the wax opacity and adhesiveness, it is again accumulated in the mandibles, and again issues forth in the ribbon-like form. The wax thus prepared is applied to the vault of the hive by a single bee (Fig. 6). After the store of wax of this founder bee is exhausted, others follow. Though there is perfect harmony among the builders, there is no co-operation in the true sense of the word, unless the fact that the many wait, while the one assumes the part of architect and lays the foundation, can be called co-operation. A solid arch of wax is built in an inverted position in the upper part of the hive. These little insects always prefer to begin at the top and build downward, though their instinct is wonderfully flexible in its power of conforming itself to circumstances; and if they are prevented from building in one direction, they build in another. Cells are then excavated from this arch, and after the foundation is dug the remainder of the comb is built upon it (Fig. 7). Ordinary cells are six-sided. The six-sided cells are of two sizes: those built for worker broods number twenty-five, and those for drone broods sixteen, to the square inch. The royal cells we will describe later. The comb, when finished, consists of a sheet of double cells arranged back to back with the utmost nicety, so that the greatest economy of space and material is secured (Fig. 8). Maraldi, the inventor of the glass hives, measured the angles of the cells with great care; he found them to be respectively 109° 28' and 70° 32'. M. Kœnig, a well known mathematician, without any previous knowledge of this measurement, was requested to determine by calculation what should be the angles of a hexagonal tube with a pyramidal base, in order that the least possible material should enter into its construction. His angles, reached by the methods of calculus, were 109° 26' and 70° 34'.

In curving their comb, as they are sometimes forced to do, and in conforming themselves to many adverse circumstances, bees often show wonderful wisdom and skill in the variation of size and shape in their cells. In curved comb, for instance, the shape of every individual cell must be changed from the ordinary hexagonal tube with parallel sides. In this case the bases of the double row of cells are of the usual size and shape; the cells on the concave side of the comb narrow from the base to the open end, while those on the convex side widen. When a transition from worker to drone comb, or *vice-versâ*, is necessary, it is effected by interposing several rows of cells of gradually increasing or decreasing size. These irregular cells are used for the storing of provisions, never for food.

When first completed the comb is pure white and very brittle; it is afterward strengthened and somewhat discolored by the addition of propolis. This is a gum collected from certain trees by the bees, and is used to make the hives both air tight and watertight. The fragile white comb is sometimes varnished with a thin coating of propolis, and at times the bees have been observed pulling down the first built comb, and working

the wax over with an admixture of this gum. The propolis is often kept ready for use in a lump placed in an accessible part of the hive. In this form it hardens till it is almost like stone; when the bees desire to use it, they have been observed to soften it by the application of the same saliva with which they imbue the wax.

When sufficient comb has been supplied to the hive the workers begin to collect stores; they rove the fields for pollen and honey. The pollen dust is gathered by the bee with its brushes and packed away in the pollen basket. It is generally collected in the morning, while the moisture renders in cohesive enough to be formed into the little balls with which they fill their baskets. When this is impossible, in consequence of the dryness of the air, the bee rolls himself in the pollen, and flies home as dusty as any miller. In the hive the farina is collected from his body and packed away. It has been known since the days of Aristotle that these little insects never store the pollen of different flowers in the same cell. Each bee comes home loaded with a homogeneous mass, and no temptation is sufficient to induce him to visit more than one kind of blossom in a single excursion. If the flowers visited by the bee yield both pollen and honey, he loads himself with both on the same trip.

The honey is gathered by means of the bee's mouth, which is a most complicated organ (Fig. 9). The proboscis penetrates the nectarium of the flower; by the aid of the tongue and other portions of the mouth, the honey is drawn up and conveyed into the honey receptacle—a sort of second stomach surrounded by powerful muscles, which enable the bee to regurgitate its contents when it reaches the hive. The saccharine secretion of flowers undoubtedly undergoes some change while in the stomach of the bee. Honey made from the clover, sugar and water, from fruit juice, does not possess a flavor that would reveal the source from which it had been obtained. The taste is not, however, wholly independent of its source: certain plants yield much more delicate honey than others. The honey of Mount Hymettus, of Narbonne, and of Pontus, all owe their exquisite and peculiar flavors to the plants frequented by the bees.

These provisions stored by the bees have their specific uses. The honey is used as food for the mature bees, and is the material from which wax is secreted. The pollen forms the food of the larvæ, and supplies to them the nitrogenous matter necessary to growing larvæ and pupæ. Many experiments have at last proved that pollen has its use also in the secretion of wax. With pollen alone bees secrete no wax; without it and with abundance of honey, they at first secrete abundantly, but soon seem exhausted.

As our hive is supposed to be supplied with a perfect, fertile queen, it will be necessary to go back a little. An old queen almost invariably leads off the swarm. She is therefore ready to begin stocking the comb with brood as soon as the workers have built it. Soon after our queen was hatched in the parent swarm, she took her first and only flight, with the exception of that in swarming time. A single fertilization is sufficient to impregnate the hundreds of thousands of eggs laid by the queen during her life of several years. Like many other insects she is fecundated on the wing. Dr. Joseph Leidy, of Philadelphia, by the aid of microscopic investigation, discovered a small sack opening into the oviduct of the queen, which is the permanent receptacle of the spermatic fluid. Dzierzon, Von Siebold, and in fact, all the greatest living naturalists of the world, have been forced into the remarkable conclusion that female bees, workers, and queens are produced from fertilized, and drones from unfertilized eggs. The sex of the egg is determined by several causes: if the queen from any malformation of the wings is unable to leave the hive, if she does not effect her flight before the expiration of three weeks from the time she is hatched, if she is starved for twenty-four hours, if she is subjected to intense cold for any length of time, and when she becomes old, she lays only drone eggs. The microscope proves that in each of these cases the spermatic sack has withered away, and can no longer perform its function of vivifying they eggs as they pass it. How the queen is able to effect this fertilization at will, though an ascertained fact, is an unexplained mystery.

While thousands of busy workers have been laying in provision for the young of their swarm and for themselves, the queen has not been idle. She has been actively employed in supplying the brood comb with eggs, sometimes to the number of three thousand a day. She generally begins the season with laying only worker eggs; these she is very careful to deposit only in their appropriate cells. If by accident or by way of experiment the hive possesses only drone comb, the queen will drop her eggs about anywhere rather than place them in the wrong cells, where they will not only perish, but, in all probability, fill the comb to no purpose. Although the queen knows what kind of an egg she is about to lay, the workers cannot distinguish their sex, as has been proved by repeated experiments. This discriminating instinct, which is perfect in the fertile queen, is wanting to the unfertilized drone-laying queen. She will frequently deposit her drone eggs in worker cells, or on the edge of comb, or anywhere else, though there may be empty drone comb in the hive. The bees have a wonderful way of dividing their labor, and then taking it for granted that each portion has been faithfully done. Where the workers find eggs in comb they assume that the queen has performed her part well, and they give it the treatment appropriate to the brood which should be found in that particular kind of cell.

After the eggs are laid they remain apparently unchanged for three or four days (according to the kind of bee which is to be developed); each one then hatches out into a small white maggot. The smaller workers, called nurse bees, now devote themseles unweariedly to the care of the larvæ. They swallow the pollen, with probably a minute quantity of honey, and after a partial digestion regurgitate it for the benefit of the young. The food is not only administered to the baby bees, but they appear to be always immersed in a sort of bath of the jelly-like substance, and to take in as much of their nutriment by absorption as by direct feeding. The little nurses are models of watchfulness and care; but occasionally they have to be reminded of their duties by the tapping of the baby bee against the side of the cradle. When the nurses think it time to feed their charges, the attention of the larvæ is attracted by some motion on their part, and they always welcome food administered. In four or six days the larva has reached maturity; the nurse bees then cap over its cell with a brown, porous, convex cover—the caps of the drone cells being more curved than those of the workers. The amount of food supplied to the maggot is ample, but it is carefully proportioned to its needs; no food is ever left in the cell when the workers close it in to undergo its final transformation.

Huber's observations of the cocoon spinning were made through the walls of blown glass cells into which the eggs had been removed. Two minute threads issue from the larva's upper lip; these become gummed together at a short distance from the mouth. The constant shortening and lengthening of its body finally enables it to complete its delicate silky covering. The common bees completely envelope themselves, while the queen spins a partial cocoon, which only reaches to the second abdominal ring. The cocoon done, the bee has reached to second of its transformations, and becomes a nymph or pupa.

The drones require twenty-four days, the workers twenty, and the queen sixteen, to complete their development, from the laying of the eggs to emergence as a perfect insect. When the time for their exit comes, the common bees make their way out of the cells as best they can, while the queen receives every care and assistance. In this the common bees would seem to need help far more than the queens, since their cocoons bind them more closely.

(To be continued.)

M. J. Husnik employs the following formula for the production of engraved plates by means of photography. It is based upon the use of bichromatized gelatin, the necessary grain being given by chloride of calcium. The formula consists of gelatin, 24 parts; bichromate of ammonia, 4 parts; alcohol, 72 parts; chloride of calcium, ½ to 5 parts; water, 240 parts. This is spread upon glass or other suitable support, and, after exposure and washing, is used for the production, by the galvanoplastic method, of a plate, from which the prints are pulled in the usual manner.

MR. WILLIAM REID, shirt manufacturer, Ropework-lane, Glasgow, has made a series of experiments with mechanism for economising thread in machine sewing, which have produced some remarkable results. The principle aimed at by Mr. Reid was the simplification of the methods of using the thread; and instead of winding it on bobbins or spools, as hitherto commonly practised, he resolved to dispense with these entirely by winding and using the thread in the form of cops. For the purpose of using these cops in sewing machines, the patentee has constructed a shuttle with a spring tension preferably placed on its cover, and the thread passing round or under this spring effectually removes any kinds which may have run out of the process of unwinding. Mr. Reid has also invented a method of using cops for the upper or needle thread, which admits of continuous lengths of 2,500 yards being used if desired.

BEES AND THEIR INSTITUTIONS.

The Queen Bee.

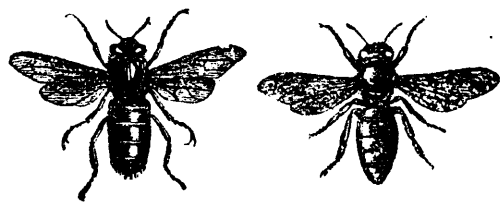
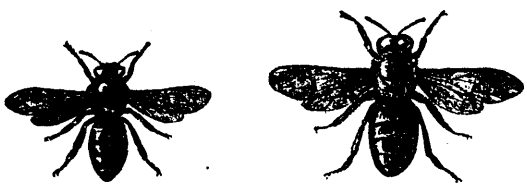


FIG. 11.—FERTILE WORKER.—QUEEN, NOT BORN BUT BRED.



Worker. Drone.

Fig. 1.—DOMESTIC BEES.

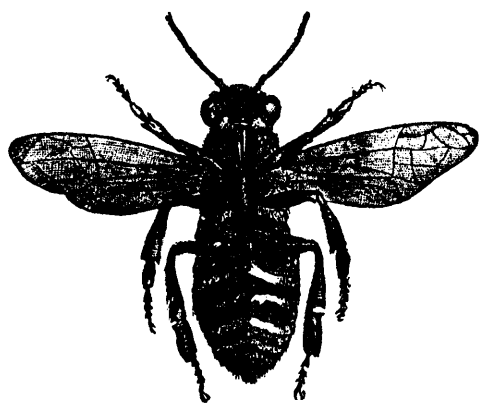


Fig. 5.—BEE (magnified), SHOWING THE WAX BETWEEN THE SEGMENTS.

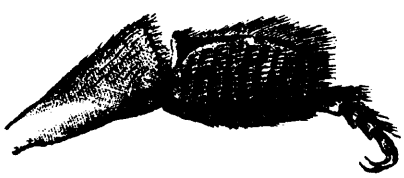


Fig. 2.—LEG OF BEE (magnified).

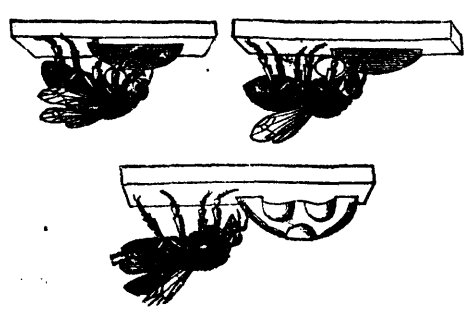


FIG. 6.—BEES CONSTRUCTING CELLS.

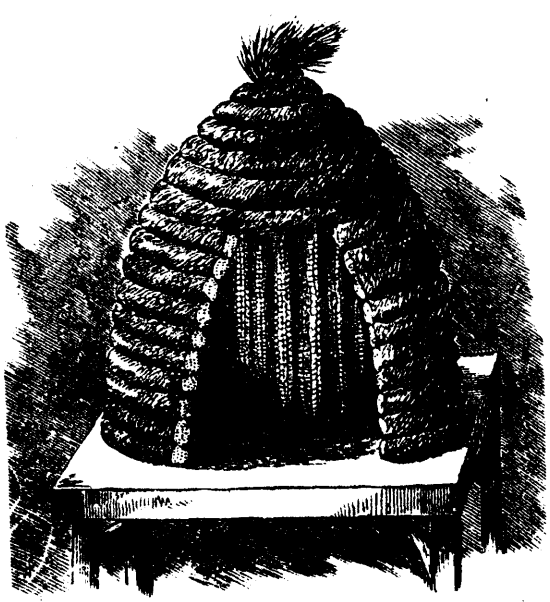


Fig. 3.—INTERIOR OF AN OLD-FASHIONED HIVE.

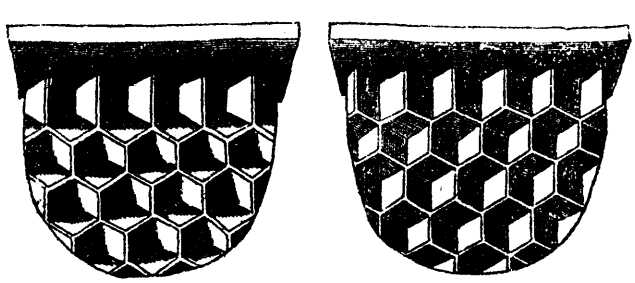


FIG. 7.—CELLS.

BEES AND THEIR INSTITUTIONS.

FIG. 4.—CLUSTER OF BEES.

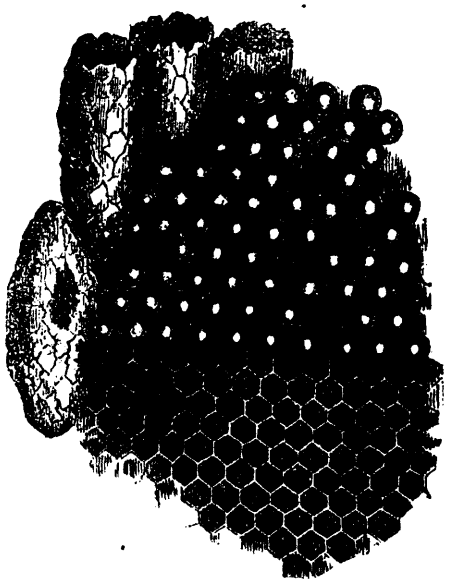


FIG. 8.—PART OF COMB.

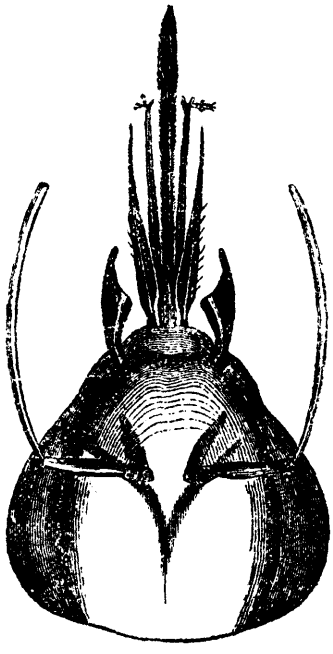


FIG. 9.—HEAD OF THE HIVE BEE (magnified.)

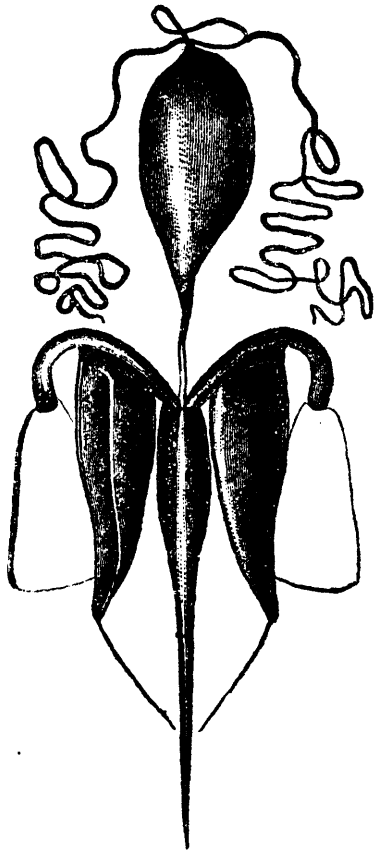


FIG. 10.—STING AND VENOM GLANDS (magnified.)

VARIETIES.

A HAPPY THOUGHT.—It was Lady Holland who, by the merest accident, introduced dahlias into England. "Having been much gratified somewhere in the South of Europe by her first acquaintance with Palestine soup, and, ascertaining that the main ingredient was the Jerusalem artichokes, Lady Holland procured what she supposed to be a root of it, and forwarded it (probably by a king's messenger) to her gardener at Holland House. When a beautiful flower came up instead of a succulent vegetable, she gazed on it with a feeling near akin to the fox-hunter who complained that the smell of the violets spoilt the scent. But the value of her acquisition began to break upon her when the London seedsmen who came to look at it, offered thirty guineas for a root."

Another version is that a root was given to her at Velentia in 1804 by a celebrated botanist, who had just received it, an unknown rarity, from South America.

THE cat's-eye is a stone of yellow-green tint, a species of the sapphire. It has threads of white asbestos within it and the light is reflected from these in an intense manner. When this stone is properly cut, a white band of light is seen floating in its interior, that changes position as the gem is moved before the eye, which peculiarity probably suggested the name by which it is generally known.

CHARMS OF NOVELTY.—Novelty has charms which our minds can hardly withstand. The most valuable things, if they have for a long time appeared among us, do not make any impression as they are good, but give us a distaste as they are old. But when the influence of this fantastical humor is over, the same men or things will come to be admired again, by a happy return of our good taste.

EMPLOYMENT for the mind is what thousands of women are in need of. After the plodding routine required for material necessities has been gone through with for the day, and the tired body requires and enjoys rest, the minds of many women reach out hungering and thirsting after intellectual food. Not having that craving satisfied is what causes unhappiness for many.

THE WIFE'S ANSWER.—A husband, finding a piece broken out of his plate and another out of his saucer, petulantly exclaimed to his wife: "My dear, it seems to me that everything belonging to you is broken."—"Well, yes," responded the wife; "even you seem to be a little cracked."

SCRAPS.—The best education one can obtain is the education experience gives us. In passing through life, learn everything you can. It will all come in play. Don't be frightened away from any pursuit because you have only a little time to devote to it. If you can't have anything more, a smattering is infinitely better than nothing. Even a slight knowledge of the arts, sciences, languages, opens up a whole world of thought. A little systematic endeavour—one hour, or even half an hour, a day—and a man may be considered learned before he dies. Learn throughly what you do learn, be it ever so little, and you may speak of it with confidence. A few clearly-defined facts and ideas are worth a whole library of uncertain knowledge.

MARVELOUS.—Among other wonders of Brazil is the wonderful pottery tree of Para. The tree attains the height of one hundred feet before sending out branches; the stem is very slender, seldom much exceeding one foot at the base. The wood is hard and contains a large amount of silica—not so much, however, as the bark, which is largely employed as a source of silica in the manufacture of pottery. In preparing the bark for the potter's use it is first burned, and the residue is then pulverised and mixed with clay in varying proportions. With an equal quantity of the two ingredients a superior quality of ware is produced. It is very durable, and will bear almost any amount of heat. The natives employ it for all culinary purposes. When fresh, the bark cuts like soft sandstone, and the presence of silex may be readily ascertained by grinding a piece of the bark between the teeth.

QUITE NATURAL.—Naturallists, when they write, are in the habit of rcording such wonderful things, that one would imagine they laboured under the idea that, instead of a natural history, they were writing a history for naturals.

"TOMMYCIDE."—"Ma," said a little girl to her mother one day, "her's a word in the paper I want to know the meaning of. What is a homicide?" "A homicide, child, is one who murders another." "Well, ma, when Jack killed our old Tom cat, that was a Tommycide, wasn't it?" "Pshaw, child!—go away, and don't bother me."

BE ECONOMICAL.—"Take care of the pennies." Look well to your spending. No matter what comes in, if more goes out you will always be poor. The art is not in making money, but in keeping it. Little expenses, like mice in a barn, when they are many, make great waste. Hair by hair, heads get bald; straw by straw, the thatch goes off the cottage; and drop by drop the rain comes into the chamber. A barrel is soon empty if the tap leaks but a drop a minute. When you mean to save, begin with your mouth; many thieves pass down the red lane. The ale jug is a great waste. In all other things keep within compass. Never stretch your legs further than your blankets will reach, or you will soon be cold. In clothes, choose suitable and lasting stuff, and not tawdry fineries. To be warm is the main thing; never mind the looks. A fool may make money, but it takes a wise man to spend it. Remember, it is easier to build two chimneys than to keep one going. If you give all to back and board, there is nothing left for the savings bank. Fare hard and work hard when you are young and you will have a chance to rest when you are old.

GUTTING THE FISH.—One evening a red-headed Connaught swell, of no small aristocratic pretensions in his own eyes, sent his servant, whom he had just imported from the long-horned kingdom in all the rough majesty of a creature fresh from the "wilds" to purchase a hundred of oysters on the city quay. Paddy stayed so long away, that Squire Trigger got quite impatient and unhappy lest his "body man" might have slipped into the Liffey. However, to his infinite relief, Paddy soon made his appearance, puffing and blowing like a disabled bellows, but carrying his load seemingly in great triumph. "Well, Pat," cried the master, "what the devil has kept you so long?"—"Long! a thin, may be it's what you'd have me come home with half my *arrant?*" says Pat. "Half the oysters?" said the master. "No, but too much of the *fish*," says Pat. "What fish," said he. "The oysters to be sure," says Pat. "What do you mean, blockhead?" says he. "I mean," says Pat, "that there was no use with loading myself with more nor was useful." "Will you explain yourself?" says he. "I will," says Pat laying down his load. "Well, then, you see, plaise your honour, as I was coming home along the quay, mighty peaceable, who should I meet but Shammus Maginnis; 'Good morrow, Shamien,' sis I. 'Good morrow kindly, Paudeen,' says he; 'what is it you have in the sack?' sis he. 'A *cwt* of oysters,' sis I. 'Let us look at them' says he. 'I will, and welcome' said I. 'Arah! thunder and pratees!' sis he, openin' the sack an' examinin' them, 'who *sowld* you these?' 'One Tom Kinahen, that keeps a small shop there below.' 'Musha then, bad luck to that same Tom that *sowld* the likes to you,' sis he. 'Arrah, why, avic!' sis I. 'To make a *Bolshour* ov you and give thim to you without gutting thim,' sis he. 'An arn't they gutted, Jim, aroon,' sis I. 'Oh! bad luck to the one o' them; sis he. 'Musha, then,' sis I, 'what the dhoul will I do at all at all, for the master will be mad,—'Do,' sis he, 'why, I'd rather do the thing mysel' nor you should lose your place,' sis he: so wid that he begins to gut them wid his knife, *nate* and *clain*, and afeered ov dirtying the flags, begor he swallowed the guts himself, from beginin to ind, tal he had thim as you see thim here," dashing down at his master's feet his bag of oyster shells, to the no small amazement of the Connaught worthy as you may suppose.

TRANSPARENT CEMENT FOR GLASS.—Dissolve 1 part Indian rubber in chloroform, and add 16 parts by measure of gum mastic in powder. Digest for 2 days, shaking the bottle frequently, apply with a fine camel's hair brush.

MOUTH WASH.—Proof spirits 1 qt. borax and honey, of each 1 oz., gum myrrh 1 oz., red sanders wood 1 oz. Rub the honey and borax well together in a mortar, then gradually add the spirit, the myrrh and sanders wood, and macerate 14 days.

CAMPHOR SOAPS.—Curd soap 28 lbs, otto of rosemary 1¼ lbs. Reduce the camphor to powder, add one ounce almond oil, then sift it; when the soap is melted and ready to turn out, add the camphor and rosemary.

WHITE WINDSOR SOAP.—Curd soap 1 cwt., marine soap 21 lbs., oil soap 14 lbs; oil caraway, 1½ lbs. oil thyme and rosemary of each ½ lb., oils of cassia and cloves of each ¼ lb.

BROWN WINDSOR SOAP.—Curd soap ¾ cwt., marine soap ¼ cwt, yellow soap ¼ cwt, oil soap, ¼ cwt. Brown coloring (caramel) ½ pt., oils caraway, cloves, thyme, cassia, petit grain and French lavender of each 2 oz.

SAND SOAP.—Curd soap 7 lbs., marine soap 7 lbs., sifted silver soap 28 lbs., oils thyme, cassia, caraway and French lavender of each 2 oz.

DOMESTIC RECEIPTS.

THREE RECIPES FOR MAKING CHEESE STRAWS.—1. Take ½ lb puff paste, 3 oz grated Parmesan cheese, a little cayenne, salt, and pepper; roll it very thin, cut it into narrow strips; bake them in a moderate oven 2. Take ¾ lb flour, 2 oz butter, broken in the flour with the fingers, and rubbed in till quite smooth 2 oz good cheese grated on a bread-grater, the yolk of two eggs and the white of one; season to taste with cayenne, and a pinch of salt. Mix all together, roll it out to the thickness of rather less than a quarter of an inch (say one eighth), place it on a well buttered tin, and cut it with a paste-cutter into stripes about the width of those used to put across an open tart, and about 4 or 5 inches in length. They must be removed from the tin with care, so as not to break them, after being baked in a moderate oven for about five or sik minutes. Biscuits can be made of a mixture prepared in the same way by using biscuit tins for cutting instead of a paste cutter. 3. Take ¼ lb puff-paste, and 2 oz Parmesan cheese (or any other good cheese) grated very fine, a little salt and cayenne mixed; sprinkle the cheese, salt, and pepper over the paste, and roll it two or three times; cut it into narrow strips about 5 inches long; bake them in a slow oven, and serve very hot.

MADEIRA CAKE.—Whisk four eggs until they are as light as possible, then continuing still to whisk them throw in by degrees the following ingredients in the order named—6 oz sifted sugar, 6 oz flour dried and sifted, 4 oz butter slightly dissolved, but not heated, the rind of a fresh lemon, and the third of a teaspoonful of carbonate of soda: beat well in just before the cake is moulded, bake it for an hour in a moderate oven. In making this cake, be particular that each portion of the butter is beaten into the mixture until no appearance of it remains before the next is added.

TO TAKE GREASE OUT OF BOARDS AND STONE.—Make a strong ley of pearl-ash and soft water and as much unslaked lime as it will take up; stir it together, and then let it settle a few minutes, bottle it, and stop close; have ready some water to lower it as used and scour the part with it. If the liquor should lie long on the boards, it will draw out the colour of them; do it, therefore, with care and expedition.

CURE FOR SMALL POX AND SCARLET FEVER.—A writer in one of the city dailies gives the following, which we print for what it may worth: In looking over my scrap-book I find the following recipe, which may prove of service to the general public at the present time. The writer says: "I herewith append a recipe which has been used to my certain knowledge in hundreds of cases. It will prevent or cure the small pox, though the pittings are filling. When Jenner discovered cow pox in England, the world of science hurled an avalanche of fame upon his head, but when the most scientific school of medicine in the world, that of Paris, published this receipt as a panacea for small pox, it passed unheeded. It is, nevertheless, as unfailing as fate, and conquers in every instance. It is perfectly harmless when taken by a well person. It will also cure scarlet fever. Here is the recipe, as I have used it, and cured my children of scarlet fever; here it is, as I have used it to cure small pox; when learned physicians said the patient must die, it cured: Sulphate of zinc, one grain; fox-glove (digitalis), one grain; half a teaspoonful of sugar; mix with two tablespoonfuls of water. When thoroughly mixed add four ounces of water. Take a tablespoonful every hour. Either disease will disappear in 12 hours. For a child, smaller doses according to age. If counties would compel their physicians to use this, there would be no need of pest houses."

TO HARDEN plaster objects, it is recommended to add to it some three or four per cent. of powdered althea root (marsh mallow). The resultant mass, in about an hour after setting, will be found to have acquired such a degree of hardness that it may be turned, sawed, &c. Buttons, dice, dominoes, &c., are made from it.

TO EXTRACT ESSENTIAL OIL FROM WOOD, BARKS, ROOTS HERBS, &C.—Take balm, mint, sage, or any other herb, &c., put it into a bottle, and poor upon it a spoonful of ether: keep in a cool place a few hours, and then fill the bottle with cold water; the essential oil will swim upon the surface and may be easily separated.

CLEANING DEAD SILVER.—Dead or engraved silver goods should never be cleaned with plate powder, but washed with a soft brush and some strong alkali, and well rinsed afterwards. When the dead or frosted parts are quite dry, the polished parts are carefully cleaned with powder.

SLEEP AS A MEDICINE.—The cry for sleep has always been louder than the cry for food. Not that it is more important, but it is often harder to get. The best rest comes from a sound sleep. Of two men or women, otherwise equal, the one who sleeps the best will be the most moral, healthy, and efficient. Sleep will do much to cure irritability of temper, peevishness, uneasiness. It will restore to vigour an over-worked brain. It will build up, and make strong, a weary body. It will relieve the langour and prostration felt by consumptives. It will cure hypochondria. It will cure the headache. It will cure the heartache. It will cure neuralgia. It will cure a broken spirit. It will cure sorrow. Indeed, we might make a long list of nervous maladies that sleep will cure.

The cure for sleeplessness requires a clean, good bed, sufficient exercise to produce weariness, pleasent occupation, good air, and not too warm a room, freedom from too much care, a clear stomach, a clear conscience, and avoidance of stimulants and narcotics.

Especially for those who are overworked, haggard, nervous, who pass sleepless nights, we commend the adoption of such habits as shall secure sleep; otherwise life will be short, and what there is of it sadly imperfect.

TO STEW LAMB WITH PEAS.—Cut into pieces of moderate size, and remove the outer skin and superflous fat. Fry it until slightly coloured, then after carefully draining it from all fat, put it into a sausepan with sufficient boiling water to cover it. Add one pint of peas—blue Prussians are best—season with pepper and salt, thicken with a little flour, and stew all slowly for half an hour.

TO MAKE FRENCH BREAD AND ROLLS.—Take a pint and a half of milk and make it quite warm; half a pint of small-beer yeast, add sufficient flour to make it as thick as batter; put it into a pan, cover it over and keep it warm. When it has risen as high as it will, add a quarter of a pint of warm water and ½ oz salt; mix them well together. Rub into a little flour 2 oz butter; then make your dough not quite so stiff as for your bread, let it stand for three quarters of an hour, and then it will be ready to make into rolls, &c.; let them stand till they have risen, and bake them in a quick oven.

STEWED VEGETABLE MARROW.—When vegetable marrows are too old and large to serve in the usual way, they may be prepared in the following manner, and will be found delicious:—Cut your marrow into conveniently-sliced long pieces, removing the seeds, &c. Then fry them very lightly in butter, in th manner as you would prepare vegetables for a haricot. Take them out and drain them well, and fry a couple of large onions sliced in the same butter, draining them well also. Have ready in a stew-pan a sufficient quantity of good stock or gravy, and lay in your marrow and onions, letting them stew till tender, but do not let them break. Put them carefully on to a hot dish, serve with the onions and gravy poured over them. You can add a little thickening to your sauce at pleasure; and, above all be carefull that whatever stock or gravy you use has been prevously well freed from fat.—

EATING BREAD AND MILK WITH LIME WATER.—Milk and lime water, says the *Scientific American*, are now frequently prescribed by physicians in cases of dyspepsia and weakness of the stomach, and in some cases, to our knowledge, the diet has proved very beneficial. Many persons who think good bread and milk a great luxury, frequently hesitate to use it for the reason that the milk will not digest readily. Sourness of the stomach will often follow. But the experience of many will testify that lime water and milk is not only food and medicine at an early period of life, but also at a later, when, as in the case of infants, the functions of digestions and assimilation have been seriously impaired. A stomach taxed by gluttony, irritated by improper food, inflamed by alcohol, enfeebled by disease or otherwise unfitted for its duties, as is shown by various symptoms attendant upon indigestion, dyspepsia, diarrhœa, dysentery and fever, will resume its work and do it energetically on an exclusive diet of bread and milk and lime water. A goblet of cow's milk to which four teaspoonfuls of lime water have been added, will agree with almost any person, will be agreeable to the stomach when other food is oppressive, and will be digested when all else fails to afford nourishment. The way to make lime water is to procure a few lumps of unslacked lime, put the lime in a stone jar, add water until the lime is slacked and is about the consistence of thin cream. The lime will soon settle and leave a clear and pure liquid at the top, which is lime water. As the water is taken out more should be added, and the lime should be frequently stirred up and allowed to settle.

Celia.—Grand Rondo.

COMPOSED FOR THE YOUNG LADIES' JOURNAL BY BOSSISSIO.