



AN

ILLUSTRATED WEEKLY MAGAZINE,

FOR THE

Architect, Engineer, Archaeologist, Constructor, & Art-Lover,

CONDUCTED BY

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"Another Blow for Life," &c.*

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruit, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedom, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"Our English word To BUILD is the Anglo-Saxon Bylðan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PUBLEY.

"Art shows us man as he can by no other means be made known. Art gives us 'nobler loves and nobler cares,'—furnishing objects by the contemplation of which we are taught and exalted,—and so are ultimately led to seek beauty in its highest form, which is GOODNESS."

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them see the propriety of working out, each for himself, the simple formula we have stated. We can tell him how much our foreign friends will have to borrow,—of us if we will let them, of somebody at all events,—in the next ten years. We can tell them this, not as matter of prediction or prognostication, but as matter of deduction from well-ascertained data. We cannot even say that the effort will be crowned with success, but we can tell the alternative. Three ways, as usual, lie before us. We think that a careful study of the map will deter any traveller, not hopelessly urged on his journey, from following either path.

There was a well-known English nobleman who was ultimately distinguished, even more than by his exalted rank, historic name, and princely seat, by his gigantic embarrassments, and by results thereof unusual to men of his order. This nobleman had a peculiarity which, according to the testimony of those who should know best, cost him something disproportionate to the luxury of his indulgence. He never would be without a certain sum of money—1,000, or so—in his possession in notes or gold. He made a point of it. In the state of the ducal revenue this sum was only to be obtained by the expensive process of borrowing; and the loan had, of course, to be negotiated, not in the City, but at the West-end, where the Bank minimum does not rule the rate of the day—or rules it only when multiplied by ten. So long as there is something hard upon certificate of ultimate payment, loans are always to be had on these terms (or were at the time we refer to) in the parishes of St. James and St. George. The upshot was, that his Grace always had his money; that he often made no use of it—that is, of this habitual reserve; so that when the three months' promissory-note on which it was advanced came due, the identical bank-notes which he had furnished were handed back to the lender, with, say a tenth more for the three months' interest. The plan had this radical defect, that if the nobleman could have made up his mind to do without this reserve of unused cash in hand for the short period of two years and a half, he would have saved the full amount by the mere delay.

Now those who would borrow the money of John Bull are in even a worse predicament than the nobleman to whom we have referred. They cannot afford to wait. They do not, indeed, borrow at 40 per cent.—at least, not as yet. But borrow they must, or else they must cease to pay for that which they have already borrowed. How much they will need between this and 1876 we may tell with some accuracy from totting up how much they have borrowed between this and 1856.

We must just make a very honourable exception. If Myrlheer wants our money we cannot do better than accommodate him: but then he does not want it. Alone in the world the Dutch government has, within the last ten years, paid off 16 per cent. of its national debt. All honor to the Dutchman!

Belgium and Great Britain must also be spoken of with respect. Omitting to notice some of the smaller and more prudent German powers, because no one is yet in a position to say what will be the effect of the war of 1866 on their financial position, Belgium and Great Britain alone, of European states, have paid the dividends of the last ten years out of revenue. The debt of Belgium, and the united debt of Great Britain and of India, have, during the last ten years only increased respectively by 4 and by 3·4 per cent. For nine years out of ten these countries, therefore, have faithfully satisfied the public creditor out of their revenues. In doing so they stand alone.

It requires no great effort of the imagination to impersonate the remaining powers of Europe as visitors to the well-stored bank of John Bull. The Spaniard stalks by, with the corner of his cloak thrown over his shoulder, and casts side-long glances at the cash-box. He does not beg,—not that he is ashamed, but that he knows it would be useless,—but he cannot resist the fascination of the jungle of counted gold. Most Southern people seem to feel that the very aspect and neighbourhood of money have something of the nature of sunlight; they like to get as near to it as they can. The Greek and the Italian are more hopeful than their experienced and repudiating cousin. They draw nigh with intent glances and agreeable smiles, and with a very consistent and dramatic story ready, so soon as they find a moment in which to tell it. The German looks on with a frown, a contribution

cigar in his mouth, and the needle-rifle in his grasp. He, too, thinks the moment inopportune. It is the Frenchman who, with an easy air, takes the pas to which he is no doubt entitled. "Mon cher Boule," says he, "I have no want of you. My own countrymen will supply my need. The discovery of the day is to go to the millions for your loans, not to the individuals. I find the idea to answer. During the last ten years I have borrowed 150,000,000 of what you call sterling. I pay 10,000,000 sterling a year in taxes more than you do. I spend 30,000,000 a year more than I did when I adopted the Imperial régime. My income will soon equal my expenditure,—next year, or in 1868 at farthest. Meantime the milliard that I mean to spend in public works will be forthcoming if I lift my finger. It would be only out of neighbourly feeling if I let you subscribe for ever so small a part of it. I shall only require two or three other milliards between 1867 and 1876 to do as I have done for the last ten years, and I shall thus readily pay the interest on my *rente*. I am in a proud and enviable position, and am happy to give you a lesson. It is not every one who can increase his funded capital at the rate of 16,000,000 a year for ten years running. I can, and I mean to do so. Some of my neighbours you can make a good thing by helping. My friend here, who has only increased the amount of his *rente* by 57 per cent. during the last ten years, will require 100,000,000 sterling to make a railway to Siberia. My Hungarian neighbour would be glad of a similar sum in order to resume specie payments. My Italian friend and *protégé* will require nearly twice as much in order to make both ends meet, while he is trying how to *faire sa se*. These are the chief investments which offer themselves at present. I am not particular for a month or two, or even for a year or two; but, if you will take the matter en bloc, you will find that nine or ten of us have borrowed, rather more than 700,000,000 sterling since 1856; and that, to pry a regular interest on this, and on what we borrowed before, we must have at least an equal sum before 1876, or the consequences will be unpleasant. In fact, as I am not in the market, I do not mind saying that we have had to borrow all the *rente* we have paid for the last ten years. To do without this assistance we should have to raise our taxes all round 30 per cent. People cannot stand that, so, when you cease to lend, we,—very reluctantly,—shall be obliged to cease to pay! You see it is to your interest to go on."

It is possible that our neighbour might not be so frank. The outline of the case, indeed, is thus correctly stated, but it might be thought prudent rather to rely on questions of detail. So much goes to the thorough examination of matter! Every man of the world acknowledges the duty of putting the best foot foremost. Thus the Frenchman may tell you with truth that his annual expenditure, per head, of the population is 5s. less than that of England; that the actual commerce of France is greater than that of Great Britain; that her area is nearly double, and her population eight millions more numerous; so that her national debt amounts to only 167 per head, instead of the 301 per head owed by the Englishman. All that is true. But it may be regarded in another light. The area and the population of France are much larger than our own, but the density of her population, that sure gauge of prosperity in an old country, is as 38 to 51. Her commerce is larger in total amount, but, taken per head, it is only as 11 to 17 compared with that of Great Britain. Her debt is less in amount and less per head, but it has increased nominally cent. per cent., and virtually 58 per cent. during the last ten years, so that every son paid to the public creditor with one hand has been borrowed from him with the other. That is the view of the same case with the other leg put forward.

We hope, therefore, when the great reservoir of unemployed money that is weekly swelling more and more within its dykes shall at last overflow, as it assuredly must do, that the diversion of the fertilising stream will not be turned to rendering buoyant foreign loans. If we see further indications of such a tendency we shall gladly strengthen the dykes by the tried statistical facts of which we have above indicated some of the results. Better take the debentures of the A, B, and C railway, which, if they represent neither capital nor interest, at least have a credit on the bank of hope, than invest savings, or hope for profit, in the never-satiated quicksands of foreign loans.

THE MAGIC OF MASONRY.

Of late years our discarded superstitions have come into vogue again for a new purpose. It is supposed that some of our old household stories, sayings, spells, and beliefs in fairies, goblins, hobgoblins, and other varieties of supernatural beings, are fragments of some old mythology that obtained among men in pre-historic times; that the deeds of the giants, dwarfs, imps, and elves to which we used to listen breathlessly were, possibly, articles of faith to the men of the iron, bronze, and stone ages, and, certainly, accepted facts with thousands in the Middle Ages; and that by gathering these together, piecing them, contrasting them with the forms the same legends have taken in other countries, we may recover some long lost lore. As we have said, it is only recently that the idea of considering these old wives' tales in the light of traditions handed down orally from Celdo or pre-Celtic people has taken root. Bishop Percy and Sir Walter Scott, the revivers of popular interest in Mediæval literature, put in no claim for so remote an origin for the "great thoughts of heart" they collected. But when we consider the tenacity with which man clings to ancient customs, especially when undisturbed by much contact with other peoples, something may be said for those who suppose that the lip-lore in question has the antiquity now assigned to it. The sacrifice of animals to avert some threatened calamity is not unknown among us at the present day, and yet science and theology have been equally opposed to such a proceeding for centuries. Yet the custom is clung to by some minds. Mr. Henderson, Durham, records that less than fifteen years ago one of a herd was so slaughtered in the county of Moray when threatened with the murrain; and, going farther back, but not beyond the bounds of the enlightenment of modern civilization, in the records of the Presbytery at Dingwall there are entries that show that the sacrificing of bulls and pouring libations of milk on mountains was practised at the island of Innis Maree, in Loch Maree, down to A.D. 1678; especially, that several members of the Mackenzie family were cited in a sane heathenish manner, on the island of Saint Rufus, commonly called Eilan Moury, in Lochew, for the recovery of the health of Cristane Mackenzie, who was formerly sick and valentinian. Now, if the tradition of this Druidical custom remained in details vivid enough to court a trial of the efficacy of the cure, how can we deny the same vitality to some of the legends of the same period? And, when we find curious legends full of uncouth power in the possession of country people, especially among those living in out-lying, hilly, and secluded places, in which the incidents as related are alike as default to scientific facts as to common sense, and could have only originated in minds that were totally unfettered by the exigencies of probabilities and possibilities, and yet were bold, plastic, and fanciful, we may suppose that we have the thread of some old story in our hand that was woven before our primeval forests were felled.

Among this quaint lip-lore there are a few statements relating to masonry, which we give as we have met with them. In the instances in which supernatural beings have endeavoured to prevent building on certain spots, we should probably not be wrong in assigning an Oriental origin for the main facts of the legends. The abandoned tower of Babel, still standing in the likeness of a mighty mound of ruin, as described by Mr. Layard, would not be without influence or celebrity; and tribes moving westwards would bring its wondrous story with them. A general belief that supernatural beings occasionally interfered to prevent the progress of building would find fresh expression in particular instances; and is, probably, the root of the particular traditions we are about to mention. In various parts of the country it is stated by the local residents that a certain house in the neighbourhood, generally the hall or castle, was attempted to be built on a different site; and after every commencement the work was always found overthrown next morning till the site was altered, when the building was allowed to proceed. A story is current to this effect concerning Callaley Castle. The edifice is seated on low-lying ground at the base of a lofty hill, about five miles north of Rothbury, in Northumberland, which is clothed with wood, ferns, and heather to its summit. From the hill a lovely prospect is gained. The rich vale of Whittingham on one side,

and the low country watered by the Coquet on the other, the one hemmed in by the Cheviot Hills in the distance, and the other bounded by the green and grey hills around Rothbury, are spread out at the feet of those that climb the towering crag; and it is at this elevation that it is believed the first builders endeavoured to plant the castle. The oldest portion of the present edifice appears to be of Edwardian antiquity. Whether it is this early portion of the stronghold or some previous work now lost sight of, that is supposed to have been interfered with by the fairies, does not appear; but the story goes, that three attempts to build upon the hill were as many times defeated; upon which it was decided to try the plain at the foot of it, where no further opposition took place. Callaley Castle was granted by Gilbert de Callaley, in the reign of Henry III., to Robert Fitz-Roger, whose son was surnamed Clavering, by King John. This son left no male issue, but his daughter's history and that of her descendants have made Callaley a centre of interest for the historian and antiquary. She had four husbands; by the second of whom, Ralph Nevill, of Raby Castle, she had two sons. In the space of six generations Lady Eva Clavering numbered among her descendants a king of England, a queen of England, a duchess of York (who in her turn was mother of two monarchs of the house of York and grandmother of a third), a duchess of Clarence, a duke of Bedford, a marquis of Montacute, an earl of Northumberland, Westmoreland, Salisbury, Kent, the Earl of Warwick, besides several other personages whose deeds are part of the history of the country. The castle has remained in the occupation of the descendants of the first Clavering down to the present day.*

We take our second example of supposed supernatural interference in the progress of buildings from a Devonshire story. It may be referred to in the appendix of Household Stories affixed to a new work on Folk-lore, by Mr. Henderson, which we have before mentioned. It will be found to the following effect:—When Sir Francis Drake, the Elizabethan navigator, proposed to build himself a house at Buckland Monachorum, he brought workmen from Plymouth, Exeter, and Tavistock, who worked with so much goodwill, some squaring the stones, others setting them, that they reached a height of six feet from the foundation the first day. Next morning, when they meant to resume their task, they found every stone removed to a great distance. This occurred twice. On the completion of the same height for the third time, Sir Francis hid himself in a tree and watched till midnight, when he perceived a multitude of little devils step out of the earth, who, with much laughing and talking, began to carry the stones away again till cockcrow, when they vanished, leaving the masons' work again demolished. Nothing daunted, the walls were rebuilt for the fourth time, when as evening approached, Sir Francis dressed himself in white, and hid himself again in the tree. At midnight the little devils appeared once more upon the scene, and were about to commence their mischievous operations when the great sea-captain flapped his arms and cried out with a loud voice, "Kikkeriki." They took the great white figure in the tree for a bird which had come to announce the end of the world; and dropping the stones they were removing, disappeared, screaming with fright. We must add that this incident in the life of Drake does not appear in Dr. Johnson's account of the navigator, although he goes into various details, including his burial at sea in a leaden coffin. Hitherto it has been popular only. Mr. Baring-Gould is doubtless right in deeming it only a fragment of a household tale that has suffered anthropomorphism. There are many other instances of the application of this kind of magic to masonry in various parts of the country. We content ourselves with calling attention to the fact and to these examples of it.

Great building powers are attributed to his Satanic Majesty. The number of Devil's causeways, Devil's dykes, Devil's gaps is curious. Near Wooler, at East Libburn, there was formerly a large heap of stones which Satan was accredited with having brought there. It was called his "Apronful of stones." When it was determined

* The popular local rhyme in which this supposed interference is recorded is as follows:—

"Callaley Castle built on the height,
Up in the day and down in the night;
Built down in the shepherd's shaw,
It shall stand for aye and never fail."

to make use of this huge cairn-like heap of material for repairing the roads, the base and fragments of a cross, raised on a platform four steps high, were found in it. This confusion between things that are sacred and things that are supposed to be accursed, is puzzling. It crops out again in the belief that the first person who enters a new church is the property of the devil. This is a German fancy. And here we may quote Mr. Baring-Gould again. "At Aix-la-Chapelle is shown a rent in the door, which is thus accounted for:—The church was ready for consecration, and before any one entered it a dog was driven in. The devil, in a rage, seized the dog, and flew away with it, shivering the door. In various parts of Germany, and in Norway, a dog or pig was hurred in the churchyard as an offering to the devil. He is thus outwitted, and receives a beast instead of a man as his tribute." In connexion with the last subject, Mr. Henderson mentions, in the interesting work we have before referred to, that a clergyman of the Church of Scotland informed him that there was a great difficulty in bringing his new churchyard into use, for no one liked to bury their dead there, as it was thought the first body interred would be a *teind* to the evil one. This feeling was only cast aside after a poor tramp was found dead on the road and buried in it. Mr. Henderson relates, of his own knowledge, that a similar dread existed with reference to the churchyard road St. John's Church, in the parish of Bovey Tracey, South Devon, which was long unused, the country people averring that the devil would seize any body laid in it; and that interments did not take place till a stranger, the servant of a visitor in the parish, was buried in it. In Aberdeenshire the workmen employed to pull down an old church on the completion of a new one, manifested some reluctance to take out the first stone of it for the purpose of pulling it down; but this difficulty was overcome when the agent for the estate pulled it out, as the second stone did not seem to involve the same terrible consequence. It was alleged that whoever pulled out the first was liable to a violent death. It is deemed just as unlucky to begin to build on a Friday as it is to commence any other task, except that of a journey through life; for, curiously, in some parts of the country, Friday is thought well of as a birthday, as witness the saying,—

"Friday's child is loving and giving;
Saturday's child must work for his living."

The ruined residence of a giant was pointed out, not many years ago, at Charlton (West), on the North Tyne. This encompassed an acre of ground, with strong walls built of large ashlar stones, 4 ft. thick. Its size, strength, and antiquity, in the absence of any exact knowledge of its history, impressed the minds of the country-people in the vicinity that it had been the habitation of some mighty giant in the days of old. This ready belief in the potency of unknown beings and unknown powers is an easy way people used to have of accounting for many things connected with building and the arts. Most of the Roman relics found on the great Roman wall were mutilated in the Middle Ages to dispossess them of any power with which their heathenish proprietors might have invested them; and many of the objects of Roman art found in the Thames seem to have been purposely mutilated for the same object. **Unknown evil spirits lurked in ruins, ghosts promenaded in churchyards, shades of various degrees haunted hundreds of houses. People used continually to see these things and to hear them: yet, where are they?** Judges and juries sat upon witchcraft cases, and frequently adjudicated death, with a fearless inconsistency, to aged people who, if they had been able to practise any occult arts, would surely have turned their most evil eye upon them for their verdict and sentence.

We have two other short stories connected with the magic of masonry to tell. The first we must call the magic of gallantry. At Heidelberg the cicerone shows strangers a handsome stately gateway leading from the castle grounds into a fair garden overlooking the windings of the river in the plain below and the academical town at the foot of the hill on which the mighty castle stands. It was here that Elizabeth, daughter of James I., was brought on her marriage to the Prince Palatine. At that time there was no gateway between the castle grounds and the garden. One day the princess said to her husband, "I wish there was a gateway here," and behold! next morning there it stood as we see

it now. He called a little army of workmen together, and built it in one night. The second gives something of the character of a fulfilled prophecy to the Britannia Bridge, between Carnarvonshire and Anglesea. Hundreds of years ago a Welsh poet prophesied that the island of Anglesea would some day be joined to the opposite shore; and, as we know, unlikely as this seemed, it has come to pass. There was a particular spot near Porthaeth-hwy where a natural jetty of small rocks appeared, as though it had once stretched across the channel, till the sea had washed away some support which caused the greater part of it to give way and tumble into the bottom of the channel, the rocks shivering and splintering as they fell. Perhaps the Welsh poet, wandering along the shore and noting the hollows and cavernous interstices formed by the masses of these fallen rocks, and seeing and hearing the sea eddying and boiling in the deep pools it formed, was plighted by the grandeur of the scene, and so moved to prophecy. The fact as this is, it is a link between minds of a very different order over an interval of centuries. Our folk-lore, however, is supposed to have had no such intercal, though extending over as many centuries, and possibly many more. From lip to ear, and from ear to lip, it has been handed down from generation to generation from we know not what remote time. When and where, for instance, originated the belief that it is a sign of good luck to the occupiers of a house for swallows to build under the eaves? This is the general impression of the whole Germanic race. Was the coming of the swallow a sign of the approach of summer to the hardy Scandinavians, and so of open seas, with fresh sea exploits and plunder, and a season of things they enjoyed? or was the confidence of the bird an assurance of a genial climate and generous soil to tribes wearied with wandering thousands of years before this?

GENERAL EXHIBITION OF WATER-COLOURS.

The sales at the "General Exhibition of Water-colour Drawings," at the Egyptian Hall, have been very good up to this time. They amount, we understand, to 2,700l. The collection, consisting of 678 frames, is an interesting one. Observers must be struck with the similarity of manner and feeling observable in the majority of the works exhibited; so much so, in fact, that many of the artists might be thought to be pupils of one master. This of course results from the proclivities of the hanging committee, who had an enormous number to select from. The number submitted, indeed, was so great, that many of the drawings could scarcely be looked at. Last year, the majority of female heads exhibited had the "I'm weary" and "He will not come" expression; and the same respect, in a somewhat less degree, will be observable in the present collection. We mention this, by the way, not in disparagement, by any means, but as indicating the school. Amongst the most finished and complete works will be noticed "Jack o' Lantern" (63), H. S. Marks, 1866, by J. D. Linton.

"Music that softens on the spirit lies,
Than tired eyelids upon tired eyes."

"Myrtle Blossoms" (177), by Simeon Solomon; "Moonshine" (196), by Adelaide Claxton (an improvement on her Ghost Scene at the Academy); "Cordelia's Portion" (249), by F. Madox Brown; "Holmby Hill" (274), a brilliant landscape, by Vicat Cole; and "The Island of Graves, Skye" (291), by Walter H. Paton. Mr. Raymond Tucker's "Boat" (27) is well floated; and Mr. A. B. Donaldson, "Tobias and the Archangel" (91), emulates oil painting. The works of Mr. Halfiday, Mr. Thomas Danby, Mr. Pynter, Mr. Waite, and others, would have merit if our notice were more extended. There are nearly fifty-nine ladies amongst the exhibitors.

VANDALISM AT TENBY.—The town council of Tenby have doomed to destruction one of the ancient gateways of their town. Few like it remain. Are there no common-sense men in Tenby (we say artistic hearts) who will move to prevent this wanton and irreparable injury to the place. To destroy a point of interest in such a town as Tenby is an act of suicide.

country. The public-houses were societies, not of "mutual instruction," but of "mutual degradation." Every man, therefore, who cared for the progress of this country, should be heartily for the establishment of clubs or halls. Every man who possessed leisure, wealth, or culture, was under a solemn obligation to make these possessions minister to the welfare of his poorer countrymen. Property has its duties as well as its rights; and this was applicable not only to wealth but to all possessions, of whatever kind, by which we may help those around us who want these things. It was not necessary to give money to these clubs or halls. Let the upper classes of society offer to those institutions their services, their co-operation, their help in discussion or entertainments; occasionally lend them their works of art, or their books; give their members the opportunity of meeting them on a common ground of goodwill and mutual benefit. These institutions would then become so popular, so crowded, that they might everywhere be established on a large basis, and become self-supporting. Every man should seek to aid in the establishment and successful working of such institutions within his own vicinity; and if this aid were given in a right spirit, it would be gladly accepted. A greater spirit of goodwill between classes—a better knowledge one of the other—was the great necessity of the time. The mutual ignorance of each other's feelings, habits, and opinions, which prevailed between the upper and the part of the other. Resentful political changes in the distribution of power made this ignorance the greater. Such institutions as they were met to-day to advocate would enable these classes to meet and know each other better, and to derive a mutual benefit on each other by co-operation and association. With more true brotherhood we should learn better to understand the true Fatherhood of God, who is above us all.

In moving a subsequent resolution, the Rev. R. Allen spoke of the advantage that might be derived on both sides by visits of persons of the upper classes to the clubs; and a resolution expressive of the sense of the meeting of the valuable services of Lord Brougham, was moved by Mr. Fry. A well-deserved vote of thanks to Lord Lytton (now by Mr. Edward Hall), terminated the proceedings.

The "Working Men's Club and Institute Union" deserves all the support claimed for it at this meeting. It owes by far the larger portion of its success hitherto to the Rev. Henry Solly, who has now resigned the secretaryship. Well-considered arrangements on the part of the Council will be needed to prevent his resignation involving a check to what has hitherto been the progress of the Union.

TRADES' UNION COMMISSION.

In the further evidence of Mr. Manly, of the Master Builders' Association, given before the Royal Commission at Westminster, he went into the question of the restraint of trade exercised by the building trades' unions in preventing the introduction and use of machinery. That is done, he witness said, more particularly by the masons, the bricklayers, and the brickmakers. In connection with the masons I may mention the case of this firm of Messrs. Coulter & Harpin, who have invented stone-working machinery which is admirably adapted for the purpose of dressing all manner of hard stone. This machinery they have endeavoured to introduce into various parts of the country, but they have been met everywhere by the fact that the masons forbid the use of machinery for the purpose of dressing stone, and, consequently, though they have had the patent out for some years now, I think they have only sold twenty-six of these machines. Six of them they have sold to Mr. Archibald Neill, a large contractor at Bradford. He employs them at a quarry which he possesses in the neighbourhood of Bradford, but although he keeps these machines going in that quarry, and it is close by Bradford, and the cost of dressing stone by that machinery is very much less than that of dressing it by hand, yet he is not allowed to use any of that worked stone in his own business at Bradford. His stone trade consists altogether, I believe, or very nearly altogether, in the supply of the London market and other markets where the unions have not been able to forbid the use of machine-worked stone. The cost of machine-worked stone is at least 35 per cent. less than the cost of hand-worked stone, and in many cases it is very much superior to hand-worked stone, especially in the case of large stones. The price of the machines varies according to their size. I think Mr. Neill told me that machines of the size that he uses cost him about 120*l.* each. I know another case of a gentleman at Manchester, named —, who many years ago invented a stone-working machine on a totally different principle from that of Messrs. Coulter & Harpin. I should explain that Messrs. Coulter & Harpin's machine is really a stone-grinding machine. It places stones face to face with other blocks of stone, and fixes the two different faces in two different frames which revolve in different ways and at different rates, and the two surfaces coming together grind each other to a true face. The machine of Mr. —, however, is a chisel-working machine; a lot of chisels are fixed in a frame and they hit the stone and make a true, very similar to the stroke that is made by a mason using a chisel, and the stone which is dressed by this machinery looks exactly like hand-worked stone, only that it is a little more regular. This machine of his he cannot introduce at all; and, in fact, when he took me to see it, he had to take me as if we were a couple of conspirators into a back street of Manchester and locked me in before he could show it to me. It was lying there completely idle, just because the masons in his employment threatened to strike all his work if he used it. To take another branch of the trade, the bricklayers of Manchester refuse to allow machine-made bricks to be used on any work that they have anything to do with; they insist upon having hand-made bricks. At Sheffield they do the same. On the other hand, I can say that the carpenters and joiners, as a rule, never make any trouble whatever about it, but are quite content to allow machinery to be used, and they

never raise any opposition whatever to it. It is simply in connexion with the masons, the bricklayers, and the brickmakers that any trouble is experienced on that point, so far as I know.

In reply to the Earl of Lichfield, the witness said that there was a way of preventing stone from being used in the area, and he had known masons to refuse to work by the buildings where this stone "axed" in the quarry had been introduced upon the premises.

The Earl of Lichfield asked:—"Would you be surprised if you were told that the cost to the employer of putting stone into a building in a particular case had been 5*s.* 6*d.* instead of 3*s.* 3*d.*, a yard, in consequence of his being unable, owing to the rules of the society, to introduce into the building stone which had been prepared by the axe in the quarry?" The witness replied, "I should not be at all surprised at that, because I know many instances very similar. I know a contractor at Manchester at the present time who is engaged in a large contract for the Midland Railway Company. His name is Mr. Edward Johnson. In that contract he requires upon walls. Now, the masons of Manchester have a rule allowing York stone which is worked upon one side to be brought into the street; but if it is worked on two sides it cannot be brought in, or if it is worked upon the edge it cannot be brought in; they simply allow the stone to be worked the Manchester masons are to joint it and work the edge, if the edge requires working, and work the other side; it requires working. Because, under the circumstance, Mr. Johnson cannot get this stone which he requires for coping the roof here another case from Messrs. Grindrod & Hargreaves, who are contractors for the new Catholic church at Barrow-in-Furness, in Lancashire. In the course of the erection they required some moulded circular limestone bases or pilasters, to the number of about 200. The stone was direct from the quarries to the works to be worked there. On the foreman learning this he interceded and expressed a wish that the bases should be worked at the contractor's yard in Liverpool, giving the following reasons:—That the workmen not having the kind of tools required to work the peculiar kind of limestone, would object to the outlay of say 1*0s.* or 12*s.* each, and that they would not work, and it was probable that they would not work them again, as the limestone referred to is rarely employed in that district. The foreman's recommendation was taken, and the order was issued for the stone to be sent to Liverpool, and there worked by members of the operative masons' society, who are paid a higher rate than the members at Barrow are. The bases were sent to Liverpool and they lay on works two or three weeks before they were fixed upon the walls. At the moment they had been fixed the masons found out that one of their local rules had been infringed upon; a general meeting of the masons in the town was called on the subject, and the enclosed resolution was agreed upon. This is the actual letter that the masons sent:—

"Rowing Green Inn, Greengate, Barrow-in-Furness, November 26th, 1866. Sir,—I remain a member of the Barrow Lodge of Operative Stonemasons to inform you that sending worked stone into Barrow is a direct violation of their local code of rules. According to a resolution passed here to-night, you are requested to withdraw the stone sent to the chapel here over again (viz., the pilasters). They have allowed you till Monday next, December 3rd, to commence the same. On behalf of the members of the Barrow Lodge, I remain, yours respectfully, Liverpool Gaudie." On the receipt of the resolution in Liverpool, one of the firm immediately proceeded to Barrow, and there met a deputation of the workmen. They were told that working them over again was impossible; that by so doing they would interfere with the architect's design, which would not be within the province of the contractors, and some hard reasoning they agreed to waive the point, but insisted on being time to look to work them being occupied again in that proportion, as it involved a considerable outlay of time and money. The deputation were then withdrawing, saying that they had no further instructions in the matter, and intimating that a strike would be called in consequence. The contractors, in view of the situation, proposed to allow them to be relied on the walls. The deputation promised to lay it before a meeting of the members, when it was ultimately decided that the matter rest, on the consideration that the bases were labour under their heads and refused, and that the contractors would promise not to introduce any worked or dressed stone into Barrow again. That statement is signed by Messrs. Grindrod & Hargreaves.

RATTENING AND RIBBANDING IN SHEFFIELD.

The disclosures made under the Sheffield Trades Union Commission are just what we expected. Of the complexity of the union officials there remains not a shadow of a doubt, notwithstanding their indignant protests against the implication that they must know more and do more to the matter than appeared in the villainous transactions which have made Sheffield a disgrace and a reproach to the whole country. And as if in defiance of commission, Parliament, and public, rattening is going on, at the very time that these exposures are being made, and that one of those who refused to give information regarding a murderous outrage in which he admitted he was engaged, has been sent to the House of Correction for six weeks, and when his employers ought to be sent for a much longer period, with the cat-o'-nine-tails to make acquaintance with.

Strange to say, it is not directly against the masters, nor for the purpose of raising wages, or lowering time, that the rascally practices of the Sheffield unionists are mainly concocted, but for

the purpose of compelling unionists themselves as well as non-unionists, to pay subscriptions to the worthies who instigate the whole of this devil's work; although it is true that the masters are thus compelled in turn to pay union subscriptions and arrears, in order to be allowed to carry on their business; and masters are also obliged to pay black-mail, in order to protect the unionists from "the tyranny of their employers!" From the infamous tyranny of the unions, it is full time the Legislature set to work to free Sheffield. They are a disgrace to unionists of all classes; and we feel certain, that whatever faults other unions may have, they will be glad to learn that the Sheffield reproach against them as a class no longer exists.

ARCHAEOLOGICAL MEETINGS AND EXCURSIONS.

The societies of the Archæology of Northampton and the counties of Bedford and Leicestershire, assembled on Tuesday in the week before last in union, at Kettering. The attendance of members was large, but the uncomfortable state of the weather at the beginning of the week kept great numbers away. However, the congress altogether was regarded as a success.

After the transaction of some official business, and a visit to Kettering church, where divine service was held, a description of the church was given by the Rev. G. A. Poole, vicar of Welford. A public meeting was afterwards held at the Corn Exchange, the rector of Kettering in the chair, when a paper titled "Some Notices of an Antiquarian Bishop of Peterborough," namely, Dr. Kennett, was read by the Rev. W. L. Collins, vicar of Kilsby. The meeting then broke up, and proceeded to examine a temporary museum, collected for the occasion. The company then started on an excursion to Rushton Hall and the Triangular Lodge, Geddington and its cross church; and in the evening partook of dinner at Kettering, and held a crowded evening meeting at the Corn Exchange, Archæology Trollope in the chair, when the Rev. H. Lindsay read a paper "On the History of Kettering," and the Rev. G. A. Poole one "On Aesthetics." Archæology Trollope described some of the chief objects of interest exhibited in the room.

On Wednesday another excursion was made to Barton Seagrave, Burton Latimer, Finedon, Irthingborough, Higham Ferrers, Stanwick, Raunds, Kingstead, Woodford, and Crauford.

In course of the excursions through the district noted for "spires and agnives," various of the churches and other places visited were described by the Rev. G. A. Poole and Archæology Trollope; and the Rev. H. Ward read a paper at Rushton "On the well-known Triangular Lodge."

"This building," said Mr. Ward, "was evidently designed to symbolise the Trinity. Almost every feature bears on the number three. The form is triangular, as denoting the three Persons, and in reference to the equality of the Godhead in the Trinity all the triangles are equilateral; next, each side of the building measures 33 ft. 3 in.; then the height of the parapet (25 ft. 7 in.) is exactly that which the apex of a triangle would reach with equal sides of 33 ft. 3 in. I have little doubt, also, if I could have ascertained the height of the centre pinnacle, that it would just be comprised within a triangle of exactly the same size, if lines were drawn from the corners of the building to it. Again, the building is of three stories, and there are three windows in each story on each of the three sides, and each of these windows has divisions of compartments of three. The shields of arms are arranged on each side in twice three complements in three lines. Another point I stumbled on is, that each of the long Latin inscriptions consists of thirty-three letters, and the single words below them are three sets of two letters on each face of the building. The very name of *Fresham* (or, as I believe it should be pronounced, *Tresham*) has a sound of three about it. The arms are made up of trifolds, arranged in threes. It is very probable that his name and arms may have given to such a strange mind as that of Sir Thomas's his in favour of this doctrine; but that his purpose in the building was that which we have ascribed to him may be proved, I think, by his adoption of the very text over the door, 'There are three that bear witness.'"

Mr. Jardine, the author of "The History of the Gunpowder Plot," says, in a letter as to this building,—

"It may be interesting to the believers in modern miracles to learn that, at all events, *rattening* is no new thing. I now send you an account of an incident in the sixteenth century which bears a strong resemblance to some of those veracious narrations which have enlightened mankind in the nineteenth century. Rushton Hall, near Kettering, in Northamptonshire, was long the residence of the ancient and distinguished family of the Freshams. In the reign of Queen Elizabeth the mansion was occupied by Sir Thomas Fresham, who was a pedant and a fanatical; but who, as an important character in his time by reason of his great wealth and powerful connections. There is a lodge at Rushton, situate about half a mile from the Old Hall, now in ruins,

but covered all over, within and without, with emblems of the Trinity. This lodge is known to have been built by Sir Thomas Tresham, but his precise motive for selecting this mode of illustrating his favourite doctrine was not known until it appeared from a letter written by himself, about the year 1651, and discovered in a bundle of books and papers, enclosed since 1698 in a well in the old manor, and brought to light about twenty years ago. The following relation of a 'rapping' or 'knocking' is extracted from this letter:—"If it be demanded why I labour so much in the Trinity and Passion of Christ to depict this chamber, this is the principal instance thereof, that, at my last being lither committed [this refers to his commitments to prison for recusancy, which had been frequent], and I usually having my servants here allowed me, to read rightly an hour to me after supper, it fortuned that Fulvis, my then servant, reading in "The Christian Revolution" in the treatise of "Proof that there is a God, &c.," there was upon a wainscot table, at that instant, three loud knocks (as it had been with an iron hammer) given to the great amazement of me, and my two servants, Fulvis and Nilkton."

LIVERPOOL.

THE valuable collection of antiquities presented to the town of Liverpool by Mr. Joseph Mayer has been formally opened at the Free Public Library and Museum, William Brown-street. The collection has been arranged by Mr. H. Eroroyd Smith and assistants, under the personal supervision of Mr. Mayer. The Gallery of Science and Invention is set apart for the collection, which appears of a far larger character than when it was housed in the Egyptian Museum, Colquhoun-street. Nearly 16,000 Whitson holiday folk passed through the rooms during the day of opening, being the greatest number ever registered.

We may mention that the learned societies of the town have resolved to mark their sense of the importance of the gift by requesting the donor to sit for his portrait, which when completed shall be deposited with those of other worthies of the town in the Royal Institution. Mr. Mayer has acceded to the request.

The town council have resolved,—"That in commemoration of the eminent services to the nation of the Right Hon. the Earl of Derby, during a long and distinguished public career, and also as a memorial of the presentation of the Derby Museum to the town of Liverpool, a portrait statue of the earl be erected in St. George's Hall."

The recorder has suggested the erection of a cathedral in Liverpool, and the suggestion has elicited offers of money.

FROM SCOTLAND.

Fall of a Railway Bridge at Dalkeith.—The Victoria Bridge, on the Ormiston and Monkton-hall branch of the North British Railway, has come down, killing one man, and seriously injuring three others. Four labourers were prodding the wagon laden with stones across the bridge, when the woodwork suddenly gave way. Men, wagon, and stones were precipitated to the ground, a distance of 30 ft. The wood-work of the bridge is said to be in a very decayed and insufficient state, having been in use for about twenty-eight years.

The Pinnelburgh Monument, Roxburghshire.—In the Vale of Teviot, and commanding an extensive view of the district, stands the monument erected by the late Marquis of Lothian and his tenantry, "to the Duke of Wellington and the British Army." It is situated on a hill named Pinnelburgh, about 774 ft. above the level of the sea. The monument itself is cylindrical in form, and 150 ft. in height. It was intended by the late marquis to be a commemoration of the valour and endurance of the British army in its crowning victory of Waterloo. Either through faulty design or faulty construction the first erection proved a failure: it was built a solid column, and fell when nearly finished. The second erection was on another plan, and built with a spiral staircase running up the inside. Up till this time the monument has not been finished. The present marquis has resolved to have this carried out; and, according to a plan supplied by Mr. Pollon, architect, London, Messrs. Herbertson & Sons, builders, Galashiels, have got instructions to proceed with the work. The monument is to be surmounted by a gallery, protected by balustrades, all of wood, a lead roof, and a spire and vane. The gallery and spire are 37 ft. in height, making the monument, when completed, 187 ft. in all. The entire fabric is being made and temporarily put up in the contractors' yard at Galashiels.

Memorial of the late Miss Catherine Sinclair.—A monument to the memory of the late Miss Catherine Sinclair, who, by her many philanthropic deeds, won a high place in the affection of a large section of the citizens of Edinburgh, is being erected on a vacant plot of ground at the junction of North Charlotte-street, with St. Colme-street. The monument is in the form of a carved gothic cross, in freestone, somewhat similar in character to the Eleanor crosses. On a broad platform of stone, 2½ ft. in height, rests the base proper of the cross, consisting of a series of three steps, each 2 ft. in height. The plan of the monument is hexagonal, with buttresses at the angles, and the total height will be 60 ft. Above the base the structure is divided into three stages, in the two lower of which the sides are finished with arched recesses, surmounted by pediments, and otherwise ornamented. The upper stage consists of a crocketed pyramidal spire. The memorial is being built from designs by Mr. David Bryce, R.S.A. The cost is to be defrayed by a public subscription, which has already been raised. Mr. Rhind, sculptor, is the contractor for the erection of the memorial.

ART-DINNER AT THE MANSION HOUSE.

THE Lord Mayor, Gabriel, distinguished his mayoralty by a dinner on Wednesday evening last, in honour of the arts of the country, given to the members of the Royal Academy, and to meet whom a large number of men, for the most part distinguished, were invited and were present. The Duke of Cambridge was kept away at the last moment by an attack of gout. The Lord Mayor spoke fluently and to the point, touching admirably each toast. Lord Stanley, the Archbishop of York, Lord Elcho, Sir Francis Grant, P.R.A., Sir Rodrick Murchison, and Mr. Tom Taylor also spoke; as did M. Gallait, the eminent Belgian painter, as representing foreign art. The Corporation should play their part in the memories of the day by commissioning some of our best artists to remove the stigma of the fact that the Mansion House does not contain a single picture. The Egyptian Hall itself greatly needs colour.

THE BIRMINGHAM ART GALLERIES.

THE Birmingham Art Galleries Association has been completely formed. A committee and officers have been appointed, and their names, it is believed, will be a sufficient guarantee that the important interests which it is the object of the Association to advance have been entrusted to able and impartial hands. It rests with the local public to support this institution, in proportion to its local and national importance; and it is to be hoped that the corporation will act with it, so as to render its operations effective and successful on a large scale. The formation of art-galleries throughout the country is a highly important desideratum, which may either be advanced or hindered to a great extent by the result of the present attempt to establish one at Birmingham. The acquisition of pictures for the art-gallery is of course one important object of the society, but it is to be hoped it will be distinctly understood from the first that it is not the only important one. Articles of art-manufacture ought to be obtained, with a view to improving the taste of the artisans and manufacturers, and to advance the cause of art generally among the many.

BOROUGH SURVEYORS AND PRIVATE PRACTICE.

NORTHERN ARCHITECTURAL ASSOCIATION.

A SPECIAL meeting of the members of this Association was held at the Old Castle, Newcastle-on-Tyne, on the 12th inst., under the presidency of Mr. John Johnstone, vice-president, "to consider the propriety of sending a deputation to confer with the committee of the town council respecting borough surveyors accepting private practice." It had been thought desirable that the attention of the committee should be called to the fact of the corporation surveyor and assistants preparing plans, with detriment to the public service.

Mr. Thompson said he would move that a small committee of the members of the Association should be formed to wait upon the com-

mittee appointed by the corporation, to state their views. He thought that it was certainly not desirable that any official—no matter how low his status—should have any private practice.

Mr. Oliver remarked that that was, he believed, the unanimous opinion of the members of the Association.

Mr. Thompson said that Mr. Bryson was looking after a house at Riding Mill some time ago, and told him that he was forced to take such work. He (Mr. Bryson) said to him (Mr. Thompson), "Do you know what salary I have?" and he guessed 200l. Mr. Bryson said, "Only 100l." Shortly after that, he believed, Mr. Bryson had his remuneration increased to 150l., and it was understood that all private practice should be put on one side. He (Mr. Thompson) was, however, astonished to find that he had been employed to check the plans in competition at Gateshead, and considered that the position which he had taken would lay him open to remark.

After discussion it was resolved, "That a memorial should be drawn up and presented by a small committee, that committee consisting of Mr. John Johnstone, Mr. A. M. Dunn, Mr. Matthew Thompson, Mr. Septimus Oswald, and Mr. Oliver, the secretary, to wait upon the committee appointed by the town council of Newcastle, to inquire into the salaries and duties of the corporate officials, for the purpose of presenting a memorial respecting the custom and propriety of borough surveyors undertaking private practice."

PROVINCIAL NEWS.

Leeds.—Messrs. Beckett & Co.'s new banking premises in Park-row the foundation-stone of which was laid on the 19th of August 1863, and which, therefore, has been upwards of three years erecting, is now completed, and opened for business purposes. The new building forms the junction of Park-row and Bond-street, opposite the Philosophical Hall. The style of architecture adopted is Early English. The building is constructed of red brick, and the outside facing bricks have been procured from Mr. Robert Bond, of Thirsk, who made them expressly to the dimensions decided upon by the architects. These bricks are very thin, of a peculiar and pleasant red colour, and smooth-faced. They have the appearance of being polished, and are laid in dark-coloured mortar, carefully jointed. To relieve the brickwork a proportion of stone has been introduced, the string-mouldings, base-course, capitals to the shafts of the windows and doors, a portion of the parapet, and other portions of the building have been executed in this material, the major part of which has been procured from Mr. Walker's quarry, Mount St. Michael, about ten miles beyond Halifax, and is said to be most durable and hard of its kind. The front of the building in Park-row is broken into three parts, the ends projecting as wings, and the centre receding therefrom. This front contains the public entrance to the bank, which consists of a projecting porch, with brick-vaunted roof. The Bond-street front is one unbroken line. The front to Basinghall-street is formed of two wings, with a screen wall between, enclosing a courtyard, which gives the private access to the bank. The north side of the building contains a dwelling-house for the resident cashier, and one for the porter. The building has been designed and erected under the superintendence of Mr. G. G. Scott, and Messrs. Perkin & Son, architects. Mr. John Kabery was the clerk of the works, and under his direction the works have been carried out by the following contractors, viz.:—Mason, bricklayer, carpenter, and joiner's work, Mr. T. Whiteley; plastering, Mr. Proctor Mountain; plumber and glazier's work, Mr. John Hall; slater's work, Mr. Samuel Croft; painter's work, Mr. F. Jackson; foundry work and hot-water apparatus, Messrs. Nelson & Sons; carver's work, Messrs. Farmer & Brindley, of London; gasfittings, Messrs. Skidmore, Coventry; caustic tile work, Messrs. Minton & Co.; granite and marble work, Messrs. Donnis Lee & Welsh.

Ringwood.—The foundation-stone of a new building, intended to be used as a corn exchange and town-hall, has been laid in Ringwood by Mrs. Morant, of Brockenhurst Park. The site selected for the building is on the left-hand side of the High-street, a short distance beyond the old town-hall. The entire depth of the new building will be 108 ft. 6 in., and of this, at the

fifth to one-eighth of Portland cement to sand, gravel, or small stone a wall may be made one-third stronger than common brickwork; or with concrete a wall may be made of equal strength with one-third the thickness of common brickwork, and of equal thickness, about one half the price. The common brick absorbs about 20 per cent. of water. The concrete wall does not absorb one quarter that quantity, and takes about a quarter that time in drying, and when made of the harder stone, and properly set, it may be said to be impermeable to wet. In the French Exhibition of building materials there is a very interesting collection of specimens of concrete from Vicat's cement (which is nearly the same as Portland), with table tops for wine taverns, of polished stone, as well as stone for foot and road pavement, and blocks for walls. In the North German department, from the manufactory at Bonn, there are large tiles made of Portland cement, with coloured concrete facings, worth examining; as also some very good sculptured casts and objects of external decoration. But the chief development of the application of cement to concrete constructions is made by M. Coignet, who, by machinery, crushes stone into a fine sand and powder as he can get it, and mixes the materials of lime and cement, and by pressure produces specimens of enormous strength; when powdered granite or porphyry is used, of strength approaching to that of the original stone. In the annex near the pond in the direction of the Pont de Jena, there is a school-house constructed by him, with statues of granite, porphyry, and other objects, specimens of the material. These various specimens go to prove that, if objects with the qualities of hard stone are required, it will be more economical to break the stone into pieces and recast it in moulds with cement than to carve it. One of the most important specimens is the flat concrete roof and its wide span, proving the possibility of making the ceilings and roofs of houses as with one large slab of stone. The principle of construction established by these concretes is that everything is made, as it were, a monolith.

A church at Vesinet, near Paris, is made of the Béton Coignet, and the steeple may be said to be a monolith. In inferior constructions this is of importance, as cisterns and large water-tanks are made of it, as in one piece, without the insecurity of numerous mere common mortar-joints. The proportions of the common beton, or concrete, were—of river-sand of good quality, 5 cubic metres; hydraulic lime, slaked in powder, 1 cubic metre; heavy Paris cement (considered equal to Portland cement), 250 kilogrammes. In 1845 I got some trial works made for the use of concrete for public drainage and sewerage work. I do not know what cement was used; but, as cements were at that time less understood, probably the wrong sort was used, for the report was unfavourable. Subsequently large quantities of Portland cement have been used for the Thames Embankment; and Mr. John Grant, the engineer in charge of the works on the south side of the river, has made very extensive trials, stated in an interesting paper, to be found in the Transactions of the Institution of Engineers of London, which establish the great strength of the material. The chief engineers of the city of Paris informed me that they have used large quantities of the Béton Coignet for sewers, for which, on account of its monolithic principle and evenness of surface, it is very advantageous; and that they are using it in the construction of bridges, and are well satisfied with it. I did not ascertain the various costs of production, but the price charged for this more finely manipulated concrete is less than for stone, though I did not perceive that in the class of dwellings in question it would have any material advantage in price over common brick; in sanitary qualities, however, it would have very great advantage indeed. It was averred that houses constructed of it, instead of being unsafe to occupy within a year, would be very safe to occupy within little more than a month.

But the Emperor has, on the advice of Mr. W. E. Newton, the English engineer, adopted for the forty new dwellings of which I have already spoken concrete construction, which will remedy almost entirely the common defect of damp walls of the first set of buildings erected by him, and give him the advantage over all the model dwellings in the Exhibition in economy and quality of wall construction, except as to quality in the double hollow walls of the cooperative association.

The new wall construction is of Portland

cement, one-eighth of cement to the gravel, sand, and stones to be got from the stratum of the foundations, and may be made without bricklayers or masons, and with common labour. Various forms of concrete walls—the cob-walls and flims in Devonshire—are of old date; but there has been one inconvenience in their construction, that deep troughs, or inclosed cases of the height of one story, were necessary; but for the Emperor's new dwellings there was used a movable case, invented by Mr. Joseph Tall, with which the walls may be constructed very quickly to any height, with considerable gain in time. With one-eighth of Portland cement the cost of this construction in England is generally about one-half the price of brickwork; and as in small dwellings, with much division-walling, nearly two-thirds of the entire cost of construction is in brickwork, this economy of half upon two-thirds is a very important gain, constituting often a turning-point of commercial advantage. Where improved model dwellings now yield 5½ per cent. as the average of the later buildings in the metropolis do, there is a great convenience of the concrete walling for distant places, in this respect, that, inasmuch as the cement is only about one-eighth the weight of the mass of brickwork, there is only about one-eighth the cost of carriage, where brick is not to be had on the spot, and where there is loose stone, sand, and gravel, or clay that may be burnt, and where there is common unskilled labour available. By putting in cylinders of zinc, and lining them with cement as the walls are carried up, and when completed, taking them out, round and smooth chimneys, and water-spouts, and ventilation and warming flues may be formed readily, cheaply, and exactly. In respect to air-rafts and spouting, the concrete construction appears to have the advantage over any of the other constructions that I found in the Exhibition, and to be readily available for much sanitary improvement. The concrete renders skirting-boards—those great harbours for vermin—unnecessary, and it runs all round the door and the window-frames, and therefore no flitting round them is required. The ceilings and roofs are made with concrete, for which Colonel Scott, R.E., has invented a very economical iron framing. Of this concrete construction of ceilings and roofs, as well as of walls and stairs, there is little but the doors and window-frames to hurn, and they may be said to be freeproof.

The colour of the concrete wall of Portland cement is that of the darker stucco colour of houses in London, or of brown paper; which, however passable it may be for exterior surfaces, leaves improvement necessary in lightness and cheerfulness, even if the inner surface of the concrete wall be smooth. Colonel Scott, who succeeded Captain Fowke at the South Kensington Museum, and who has conducted extensive experiments on cements (stated in the Transactions of the Royal Engineers), and is deemed a leading authority on the subject, has invented one cement, which appears to be the desideratum for cheap wall-facing. It is a species of artificial gypsum, of a light warm colour, or of a light lime colour. When properly laid on, it is even better than Parisian facings. It is hard, impermeable to wet, and it is, above all, washable. It has already been introduced for the lining of hospital wards, as possessing the requisite qualities. The expense of a facing with this cement, if properly used, is about two-thirds the expense of the ordinary three-coat work.

On the question of comparative economy of the concrete walling and the brick walling, it is assumed that the two walls are of equal thickness; but in the plans of model dwelling originally presented to the Prince Consort a construction was proposed on the panel or buttress principle, to economise material as well as space, the hearing power being supplied by the buttresses; and this may be given by 9-in. walling, with concrete, or in appropriate form of hollow brick; and 4-in. or 5-in. walling of the right materials may serve for the necessary protection against the weather. 4-in. walls of properly-made hard hollow brick are proved to be better protection against weather in times of frost than 9-in. or 14-in. common brick or soft stone.

In the English exhibition of materials there is a new species of walling, invented by Mr. B. Nicoll, of London, which presents very great advantage in non-absorbency of moisture, in internal facing, in saving space as against common brickwork, and being lower in price. Over a framework of strong cross wires, of about an

eighth of an inch thick, there is woven by a powerful machine a mass of straw or fibrous matter, which is saturated with a solution which renders it fireproof. It is then subjected to very powerful pressure. A coating of light Scott's cement mixed with Paris cement is then put upon it for inside facing, and of Portland cement for the outside facing. The surfaces are impermeable to moisture, smooth and washable with water, so as to save the expense of repeated lime-washing. It is formed into slabs in iron frames, which are put together and closely and securely fastened with bolts. The slabs are from 1½ in. to 4 in. thick. These slabs serve as superior panelling for dividing walls and partitions. Where space is of importance it has the advantage, perhaps, over concrete walling, in enabling a wall to be made of not more than 1½ in. or 2 in. in thickness, and yet its quality deadens sound. It has also great advantages for weatherproof roofing superior to slate or tile, though not, as I conceive, superior to well-made hollow brick (when it can be got), tied together with iron ties and covered with layers of asphalt and cement. In the Prince Consort's model the principle of the flat roof was adopted, but none of the model dwellings in the Exhibition have attained to that principle.

Where ground-space is dear, as it is with dwellings of the labouring classes in town, there is good reason for utilising the roof-space. It serves as an additional drying-ground. In dry weather it may be used for the children to play on. One example has been set in London, where in a densely-crowded neighbourhood, there being no playground for a boys' school, they have made one for them on the flat roof. If any one will look over the city *ouvrières* of Mulhouse, it will be seen what a large amount of roof-space is lost; and yet the cost of the weather-tight flat roof of concrete or hollow brick is nearly a third less in England than the timber, slate, or tile roof. Its greatest convenience or use, however, would be for self-contained dwellings; on them the father of the family may sit in fine weather, and have better air and an extended prospect, and enjoy himself in the Oriental fashion.

In respect to the economy of these improved constructions, there can be no doubt that fully 24 per cent. of saving is attainable, either on the hollow-brick principle, on the simple concrete principle, or on the Nicoll wall principle of construction. Mr. Samuel Sharp has made a very close estimate of a four-tenemented dwelling, on the principle of construction of the Prince Consort's model dwelling. At the present prices in England such a dwelling could not be constructed of brick for less than 400l., or 100l. each separate dwelling. On the concrete principle of construction, with Nicoll dividing walls, it might be constructed for 300l., or 75l. each dwelling, minus the cost of land. Apart, however, from the superiority in quality, the improved dwellings would have a gain of cubic space. The cost of the chief dwellings and the space in them is as follows:—

	Total cubic space.....	Cost per cubic foot.....
The Mulhouse dwellings.....	8,025	3
The Workmen of Paris ditto.....	5,950	5½
The Co-operatives of Paris ditto.....	7,980	4
Model dwellings (concrete), with washable interior walls, on the Prince Consort's principle of flat roofs.....	4,800	3

THE NEW DISCOVERIES IN ACOUSTICS.*

THAT the acoustical force is closely correlated, and strictly analogous, to the other forces connected with material substructure, and especially to the electric, as has before been noted in the *Builder*, and to the elastic and cohesive forces, as well as probably to the diamagnetic and magnetic; and that the acoustical force is subject to laws strictly analogous to those even of light and heat, although its semi-mechanical nature shows it still closer affinity to the forces first referred to,—all this is now becoming more and more apparent. Professor Tyndall has of late been much engaged in this special field of scientific research, and his discoveries are likely to lead to important progress towards a clearing up of those perplexing mysteries in respect to acoustics in the design and construction of churches and halls which so often trouble and

* "Sound: A Course of Eight Lectures, delivered at the Royal Institution of Great Britain." By John Tyndall, LL.D., F.R.S. London: Longmans, Green, & Co. 1867

Disappoint the architect. Meantime, however, the science is in a very immature state in such respects as these, but the results already attained are both curious and instructive. We have more than one given particulars from Dr. Tyndall's lectures, while they were in course of delivery, and especially as to sensitive flames, or the influence of the sounds of articulate speech upon gas jets; and we propose here to give some further details, as to both singing and sensitive flames, and as to the laws and conclusions already deduced from these and other researches on acoustical vibrations.

Friction, remarks Dr. Tyndall, is always rhythmic. When we pass a reined bow across a string, the tension of the string secures the perfect rhythm of the friction. When we pass the wetted finger round the edge of a glass, the breaking up of the friction into rhythmic pulses expresses itself in music. Savari's experiments prove the friction of a liquid against the sides of an orifice through which it passes, to be independent of producing musical sounds. Let a tube be filled with water, its extremity being closed by a plate of brass, which is pierced by a circular orifice of a diameter equal to the thickness of the plate. Removing a little peg which stops the orifice, the water issues from it, and as it sinks in the tube a musical note of great sweetness issues from the liquid column. This note is due to the intermittent flow of the liquid through the orifice, by which the whole column above it is thrown into vibration. The tendency to this effect shows itself when tea is poured from a teapot, in the circular ripples that cover the falling liquid. The same intermittence is observed in the black dense smoke which rolls in rhythmic rings from the funnel of a steamer. The unpleasant noise of a mangle machinery is also a declaration of the fact that the friction is not uniform, but is due to the alternate "bite" and release of the rubbing surfaces.

Where gases are concerned friction is of the same intermittent character. A rifle bullet sings in its passage through the air, while to the rubbing of the wind against the bores and branches of the trees are to be ascribed the "waterfall notes" of an agitated pine-wood. Pass a steadily-burning candle rapidly through the air; an indented band of light, declaring intermittence, is the consequence, while the almost musical sound which accompanies the appearance of this band is the audible expression of the rhythm. On the other hand, if you blow gently against a candle flame, the fluttering noise announces a rhythmic action. When a gas flame is simply enclosed within a tube, the passage of the air over it is usually sufficient to produce the necessary rhythmic action, so as to cause the flame to burst spontaneously into song. Not all, however, are aware of the intensity to which this flame-music may rise.

In speaking of his researches as to singing flames, Dr. Tyndall says:—

"While executing these experiments I once noticed that, on raising my voice to the proper pitch, a flame which had been burning silently in its tube began to sing. The song was interrupted, and the proper note sounded several times in succession. In every case the flame responded by starting into song. The same observation held, without my knowledge, been made a short time previously by Count Schudgotsch. Observe the conditions of the experiment. I place a tube 12 in. long over this flame, which occupies a position within the tube about 11 in. from its lower end. When the proper note is sounded the flame trembles, but it does not sing. I lower the tube so that the flame shall be 3 in. from its lower end; it bursts spontaneously into song. Now, between these two positions there is a third, at which, if the flame be displaced, it will burn silently; but if it be excited by the voice it will sing, and continue to sing.

In this position, then, it is able to sing, but it requires a start. It is, as it were, on the brink of a precipice, but it requires to be pushed over. I place the flame in this position; it is silent; but on the sounding of the proper note it stretches forth its little tongue, and begins its song. By displacing my finger for an instant on the end of the tube I stop the music; and now, standing as far from the flame as this room will allow me, I command the flame to sing. It obeys immediately. I turn my back towards it and repeat the experiment. My body does not shake; the flame stops the music; the sonorous pulses run round me, reach the tube, and call forth the song. A pitch-pipe, or any other instrument which yields a note of the proper height, produces the effect. When a silent flame capable of being excited is looked at in a moving mirror, it produces there a continuous band of light. Nothing can be more beautiful than the sudden breaking up of this band into a string of richly luminous pearls at the instant the voice is pitched to the proper note."

While treating of sensitive naked flames the doctor described some extraordinary phenomena.

"The most marvellous flame hitherto discovered," he remarks, "is now before you. It issues from the single orifice of a stearic burner, and reaches a height of 24 in. The slightest tap on a distant nail reduces its height to a trifle. When I take this bunch of keys the flame is violently agitated, and emits a loud roar. The dropping of a sixpence into a hand already containing coin, at a distance

of 20 yards, knocks the flame down. I cannot walk across a floor without agitating the flame. The creaking of my boots sets it in violent commotion. The crumpling or tearing of a bit of paper, or the rustle of a silk dress, does the same. It is started by the patter of a raindrop. I hold a watch near the flame; nobody hears its ticks; but you all see their effect upon the flame. At every tick it falls. The winding up of a watch also produces tumult. The twister of a distant spin or shaker of the flame down the note of a cricket would do the same. From a distance of 30 yards I have chirruped to this flame, and caused it to fall and roar. I repeat a passage from Spenser:—

'Her ivory forehead, full of bounty brave,
Like a broad table did itself dispart;
For Love, his lofty tumpet to engrave
And write the battles of his great godhead,
All truth and goodness might therein be read,
For there their dwelling was, and when she spake,
Sweet words, like dropping honey she did shed;
And through the pearls and rubies softly brake
A silver sound, which heavenly music seem'd to make.'

The flame picks out certain sounds from my utterance; it notices some by the slightest nod; to others it bows more distinctly; to some its obeisance is very profound, while to many sounds it turns an entirely deaf ear. It is to be observed, in chirruping to it, or in shaking a bunch of keys within few yards of it, great part of the flame is actually destroyed, a pale and almost non-luminous residue of it alone remaining.

We have called this the "vowel flame," because the different vowel sounds affect it differently. These sounds differ from each other through the admixture of higher notes with the fundamental note. It is to be observed, as to the fundamental one, that our flame is sensitive. I utter a loud and sonorous *r*, the flame remains steady; I change the sound to *o*, the flame quivers; I sound *a*, and now the flame strongly attracts me. I utter the words *boat, boat, and boat* in succession. To the first there is no response; to the second the flame starts; but by the third it is thrown into greater commotion; the sound *A!* is still more powerful. Did we not know the constitution of vowel sounds, this department would be an insoluble enigma. As it is, however, the flame is a demonstrator of the theory of vowel sounds. It is to be observed, in chirruping to it, or in shaking a bunch of keys within few yards of it, great part of the flame is actually destroyed, a pale and almost non-luminous residue of it alone remaining. This flame is peculiarly sensitive to the utterance of the letter *s*. If the most distant person in the room were to favour it with this letter, it would instantly and sympathetically with him. A hiss contains the elements that most forcibly affect this flame. The gas issues from its burner with a hiss, and an external sound of this character is therefore exceedingly effective.

Finally, I place this musical box upon the table, and permit it to play. The flame behaves like a sentient creature; howing slightly to some tones, but courtesying deeply to others.

It is not to the flame, as such, that these effects are ascribed. Effects substantially similar are produced when jets of nitrified coal-gas, carbonic acid, hydrogen, or air are employed. These jets may be rendered visible by smoke, and the smoke jets show a sensitiveness to sonorous vibrations even greater than that of the flames.

When a brilliant sensitive flame illuminates an otherwise dark room, in which a suitable bell is caused to strike, a series of periodic quenches of the light by the sound occurs. Every stroke of the bell is accompanied by a momentary darkening of the room.

Savari's experiments on the influence of sonorous vibrations on jets of water belong to the same class of effects. This subject is treated of in the lectures.

In experimenting on the law of vibratory motions and the theory of beats, a curious experiment with a small brass table or mounted disc with the hands are laid, reminding one of the spirit-knocking process, is thus described:—

"We are now prepared for a very instructive experiment which we owe to M. Lescaignes. I divide this brass disc into six vibrating sectors, and bringing the palm of my hand near any one of the sectors, I intercept its vibrations. The sound is augmented. Placing my two hands over two adjacent sectors, you notice no increase of the sound. Placing them, however, over alternate sectors, a striking augmentation of the sound is the consequence. By simply lowering and raising my two hands, I produce these marked variations of intensity. By the approach of my hands I intercept the vibrations of the two sectors; their interference right and left being thus abolished, the remaining sectors sound more loudly. Passing my single hand to and fro along the surface, you also bear a rise and fall of the sound. It rises when my hand is over a vibrating sector; it falls when the hand is over a nodal-line. Thus, by sacrificing a portion of the vibrations, we make the residue more effective. Experiments similar to these may be made with light and radiant heat. If of two beams of the former, which destroy each other by interference, one be removed, light takes the place of darkness; and if of two interfering beams of the latter one be intercepted, heat takes the place of cold."

The following summary of the lecture just referred to will show in what way light upon acoustical difficulties may be looked for hereafter, when the subject has been a little further investigated:—

"When several systems of waves proceeding from distinct centres of disturbance pass through water or air, the motion of every particle is the algebraic sum of the several motions impressed upon it. In the case of water, when the crests of one system of waves coincide with the crests of another of higher waves will be the result of the coalescence of the two systems. But when the crests of one system coincide with

the sinuses, or furrows, of the other systems, the two systems, in whole or in part, destroy each other. This mutual destruction of two systems of waves is called interference.

The same remarks apply to sonorous waves. If two systems of sonorous waves condensation coincides with condensation, and rarefaction with rarefaction, the sound produced by such coincidence is louder than that produced by either system taken singly. But if the condensations of the one system coincide with the rarefactions of the other, a destruction, total or partial, of both systems is the consequence.

Thus, when two organ-pipes of the same pitch are placed near each other on the same wind-chest and thrown into vibration, they so influence each other, that as the air enters the embouchure of the one it quits that of the other. At the moment, therefore, the one pipe produces a condensation the other produces a rarefaction. The sounds of two such pipes mutually destroy each other.

When two musical sounds of nearly the same pitch are sounded together the flow of the sound is disturbed by beats.

These beats are due to the alternate coincidence and interference of the two systems of sonorous waves. If the two sounds be of the same intensity their coincidence produces a sound of four times the intensity of either; while their interference produces absolute silence.

The effect, then, of two such sounds in combination, is a series of shocks, which we have called 'beats,' separated from each other by a series of 'pauses.' The rate at which the beats occur each other is equal to the difference between the two rates of vibration. When a bell or disc sounds, the vibrations on opposite sides of the same nodal line partially neutralise each other; when a tuning-fork sounds the vibrations of its two prongs in part neutralise each other. By cutting off a portion of the vibrations in these cases the sound may be intensified.

When a luminous beam, reflected on to a screen from two tuning-forks producing beats, is acted upon by the vibrations of both, the intermittence of the sound is announced by the alternate lengthening and shortening of the bands of light upon the screen. The law of the superposition of vibrations above enunciated is strictly true only when the amplitudes are exceedingly small. When the disturbance of the air by a sound is nearly so violent that the law no longer holds good, secondary waves are formed which correspond to the harmonic tones of the sounding body.

When two tones are rendered so intense as to exceed the limits of the law of superposition, their secondary waves combine to produce resultant tones.

Resultant tones are of two kinds: the one class corresponding to rates of vibration equal to the difference of the rates of the two primaries; the other class corresponding to rates of vibration equal to the sum of the two primaries. The former are called difference tones, the latter summation tones."

We hope to hear more, shortly, of Dr. Tyndall's curious researches. The volume under notice is an exceedingly interesting one.

THE JUNIOR CARLTON CLUB-HOUSE, PALL-MALL.

In consequence of the large number of candidates waiting for admission to the Carlton and Conservative Clubs, it was thought desirable to establish a new club, and at a meeting held in the year 1864 at the Carlton Club-house a committee was appointed to carry out that object.

Several offers of properties in Pall-mall, St. James's-street, Regent-street, and Piccadilly were made in answer to advertisements, and eventually a site in Pall-mall was decided upon, on account of its eligibility with reference to the Houses of Parliament, and from the fact of its being entirely freehold.

Considerable difficulty and delay were experienced in purchasing the interests of the several tenants, but that was accomplished in the course of last year, when the new club-house, of which we will illustrate the front in Pall-mall, was commenced by Messrs. Lucas, Brothers, who had obtained the contract in a limited competition.

It will be seen from the plans that there will be two frontages, one in Pall-mall, and the other in St. James's-square.

The rooms of the club-house are arranged as follows:—

On the ground-floor is an entrance-hall, 27 ft. by 23 ft. 6 in.; a reception-room, 29 ft. 6 in. by 20 ft. 6 in.; a morning-room, 89 ft. by 27 ft.; a smoking-room, 28 ft. by 29 ft. 6 in.; and a principal staircase, 30 ft. by 23 ft.

There is also a second staircase, and serving attendants' rooms, and an entrance in St. James's-square for members who have bedrooms.

On the first-floor is a members' coffee-room, 30 ft. by 27 ft., divided by a plate-glass screen from a strangers' coffee-room, 27 ft. by 27 ft.; a house dining-room, 28 ft. by 20 ft. 6 in.; a library, 40 ft. by 29 ft. 6 in. There is another serving-room on this floor.

The heights of these stories are respectively 20 ft., except where the mezzanine occurs on the north side, in which are lavatories, attendants' room, &c.

On the second floor are two billiard-rooms, one being 27 ft. 6 in. by 27 ft., the other 29 ft. by 21 ft., the secretary's offices and bed-room, and a second smoking-room for visitors. The

and we now speak with only one desire, the success of the undertaking, if Mr. Reed would have it take the position it should, and we have every reason to believe it would take, he must obtain assistants who can act and sing. At present the company has too amateurish an aspect to command a great success. There is another hint we would give him. The draught from the Regent-street entrance must be prevented. At present, even in the stalls, it is intolerable. A majority of our theatres this nuisance is unbearable.

The Polytechnic Institution.—The new lecture which Professor Pepper has prepared for the holiday season, "Faraday's Discoveries and their Results," includes matter more erudite than is usually administered here—matter, too, of very great interest. There are few people who, when they have heard there was a fault in the submarine cable, and it was about so many miles from shore, have not asked how it was possible to determine this latter point. The description in this lecture of "Wheatstone Bridge," as it is called, answers the question. Some amusing optical deceptions in the moving of tables and raising of Tohins are also shown; but to set these forth as any answer to the so-called Spiritual Manifestations of the day is a great mistake. They do not touch the matter at all, and would simply give the "Spiritualists" an easy victory. Electricity is receiving considerable attention just now at the Polytechnic, and the directors contemplate setting up a machine that will give a shock capable of killing off a man.

CHURCH-BUILDING NEWS.

Selby.—The church of St. James, at Selby, has been consecrated by the Archbishop of York. The building is being finished by the executors of the late Mr. James Andus, in whose lifetime it had been commenced, and who had agreed to be at the sole expense connected with the work. The tower is still in process of construction, and some external ornamentation to be carried out. The building has been constructed from designs by Messrs. Newstead & Low, of York and London, and consists of a nave, with aisles, chancel, and organ-chamber on the south side and vestry on north, and tower with spire at the west end. The total length of the church is 122 ft., the width 50 ft., and the tower and spire will rise to a height of 165 ft. The lower part of the tower is for use as a baptistery. The style is of the Early Geometrical period. It is built upon a plinth of Sheffield blue stone, and the external walls are fenced with Bradford sets with Ancaster stone dressings. The aisles are divided from the nave by five bays, the arches of which rest on single polished red Isle of Mull granite columns, each shaft being one piece, and having carved capitals in Ancaster stone. A variety of stones is used in the building internally, as well as externally. The chancel arch is carried on clustered haunched shafts of red Devonshire marble, with carved capitals and stone bases. An eastern window is filled with stained glass, which has been executed by Messrs. Heaton, Butler, & Bayne, of London, and contains the following subjects in the five lights.—The Call of St. James, the Raising of Jairus's Daughter, the Transfiguration (centre light), the Agony in the Garden, and the Martyrdom of St. James. The east wall, on either side of the reredos, is ornamented with a moulded and cusped arcade, supported on Italian Bardilla and Spanish-Naxos marble columns. A sedilla has been introduced. The roofs are open and of stained timber, and the beams rest on carved corbels. Maw's encaustic tiles, in many different patterns, have been used to pave the church. The reredos is constructed mainly of polished Derbyshire alabaster, enriched with carving. It is divided into three panels, by coupled and single polished green serpentine shafts, with moulded arches, and surmounted with a moulded and carved cornice, with a cresting inlaid with bosses of polished Derbyshire spar of various colours. The lectern takes the conventional eagle form, but has been modelled for the architects from studies made by them at the Zoological Gardens. The organ has been built by Messrs. W. Hill & Son, London. The sittings are entirely free.

Newington.—The Bishop of London has consecrated the new church of St. Matthew, in the New Kent-road, near Newington-batts. The edifice, which, exteriorly and interiorly, is of a light character, has been built within seven

months, Mr. Henry Jarvis, a local architect, and Messrs. Myers, the contractors, having been engaged in its erection. Mr. Robert Stephen Faulconer, of Waltham, and Mr. Whitehead have given large sums, the former about 5,000l. and the latter 1,000l. towards the cost.

Norwich.—St. Andrew's Church has been undergoing some further restorations. The present work has been to scrape and clean the stone-work; to restore the mutilated columns, the bases of which require to be nearly rebuilt; to banish the old square pews, and to substitute open benches. The scrapings of the columns brought out the warm colour of the stone which had been hidden beneath coats of whitewashing, and the walls have been tinted with a corresponding colour. The side passages are so arranged as to show freely and in full prominence the bases of the columns, without interfering with the arrangement of the benches. The material of which the old pews consisted has been employed in the new benches, the ends of which, towards the centre aisle, consist of deeply-recessed panels, made of the old oak, surmounted with tracery. The architect was Mr. William Smith, of London; and the contractor, Mr. Burrell, of this city.

Bury St. Edmunds.—St. Mary's Church has had the pews replaced by open benches, and the organ enlarged and rebuilt, and placed in the north aisle of the chancel. During these and other alterations, the edifice has never been entirely closed.

West Bromwich.—The new school church, which has just been erected in the Wednesbury-road, in All Saints' district, West Bromwich, has been formally opened. The foundation-stone of St. Andrew's Church was laid in June last, by Mrs. T. Jesson. The building is in the Domestic Gothic style. Mr. Somers Clarke was the architect. At the east end are the altar and super-altar. The church is built to hold 400 people, and when not in use as a church will be appropriated off into schools.

Firle.—The parish church of West Firle has been re-opened after extensive restoration and repairs. A little longer delay, and the whole church would have fallen down. With the approbation of the landowner of the parish, as well as of the vestry, the services of an architect were obtained.—Mr. Gordon M. Hills; and under his direction the works were undertaken; Mr. Davey, aided by Messrs. Parsons, of Lewes, being the contractors; and Mr. H. Weller, of Firle, acted as clerk of the works. The west walls of the two aisles were rebuilt, the roofs of the two aisles replaced on walls raised to the original height, the main roof of the nave strengthened, and the plaster ceiling replaced with a wooden lining. The modern windows in the clerestory were taken out, and six windows of the ancient form inserted, and a window in the east wall of the nave, which has been blocked up, re-opened. The arcade on the south side of the nave was underpinned and placed on a sound foundation. The gallery, which blocked up three arches, was removed, accommodation for the school children and inmates of Firle union house, who used to occupy it, being found in the body of the church. Outside, new buttresses have been built to support the fabric. In addition to these repairs, which were undertaken solely at the expense of the landowner, Viscount Gage, aided by a rate; the vicar, assisted by his friends, undertook the renewal of that part of the building especially set apart for the due and orderly celebration of the services of the church. The chancel and sacristy have been paved, and a reredos erected, of tiles furnished by Messrs. Maw, from designs by their agents Messrs. Tompson & Sons, of London.

Dilwyn (Herefordshire).—The parish church has been restored and re-opened. Mr. G. C. Haddon, of Hereford, was the architect employed, and Messrs. Lewis & Day, also of Hereford, were the contractors. The cost of the restorations is about 1,300l., including the Powell Memorial east window, by Messrs. Heaton, Butler, & Bayne. The reredos is the work of Mr. Forsyth, of Worcester, and is in marble, Caen, and Painswick stone. The east window consists of three lights. The centre window contains the "Crucifixion," with the sun and moon darkened over the cross, and St. John and the two Marys grouped around its foot. The north light has the "Nativity." On either side are the shepherds and the Magi, the whole surrounded by the star of Bethlehem. In the south light the "Ascension" is represented. The head of the window is filled with the sacramental emblems—wheat and grapes—and the paten and chalice.

Books Received.

Abyssinia and its People; or, Life in the Land of Prester John. Edited by JOHN CAMDEN HOTTEN, Fellow of the Ethnological Society, &c.; with a new Map and eight coloured Illustrations, by MAL. VIGNARD & BARRAT. London: Hotten, Piccadilly. 1868.

THE most useful knowledge we can have at this moment in regard to Abyssinia is not so much what the most recent traveller through the country has to say, but what all Abyssinian travellers have said of it, including the most recent; and this is precisely what Mr. Hotten gives in a considerable portion of his very interesting volume. Considering the stereotyped and almost unchanging habits and character of Eastern peoples, much of what old travellers have told us of this people holds good to the present day; and indeed not a little of what was said in former times, but doubted by some readers, more modern visitors to the country have only confirmed. A book giving us the pith of all that has been said of our semi-savage foe—if we can call the Abyssinian people our foe—is therefore the most acceptable gift that could be presented to the public on this subject in this gift season.

The volume is divided into five parts;—on the country as seen by early and recent travellers; Consul Plowden's excellent description of the people and their country; the story of the British captives; suggestions for an expedition, with routes; and a bibliography of all the known works relating to Abyssinia.

VARIORUM.

ADDRESS to the members of the Historic Society of Lancashire and Cheshire. By Joseph Mayer, F.S.A., &c. Liverpool: printed by Thomas Brakell, Cook-street. Any remarks by Mr. Joseph Mayer on archeological or antiquarian subjects merit attentive consideration, and they are sure to receive it. The first subject treated of in this paper is the kitchen-midden folk of pre-historic times. The era when this race of men existed appears to be to a certain extent identified by the remains of the caperulizze, a bird which feeds on pine buds. The pine era of Denmark preceded its oak era, and that its heath era. If there was a pine era in this island at the same time, here is a proximate fixture of the geological era when the kitchen-midden people flourished. The era was a very ancient one, perhaps ten thousand years since, or even much more, and when the climate was much colder than it now is, but by no means so ancient as the era of the glacial drift, in which traces of still more ancient man have been found. Many of the kitchen middens accordingly occur along the present coasts, but not all of them: some are miles inland. Mr. Mayer considers the question of migration; as to which all we shall say is that we have never seen any allusion made to the facilities afforded to extremely ancient migrations, at an era even subsequent to the glacial, but when the climate was colder, by the freezing of the ocean surface farther south than now. Thus, for example, there certainly was a time, after the glacial era had waned, when Britain and the Continent were united every winter by a frozen sea. The wandering Esquimaux, and the Lapps, are probably remnants of ancient races whose fields of migration have only been narrowed by the milder climate of the present juxta-arctic region, which had not retreated so far to the north as now. Thus, amongst the Esquimaux and the Lapps, we probably have the likeliest state of mankind to that of the aborigines of this island—the earliest Britons and Prets, but especially to the glacial drift races. An account of the Lapps and Esquimaux, written by the light of these views, and of the glacial drift, flint implement, and kitchen midden phenomena, might shed a reflex light of great interest on the probable state, habits, and customs of our extreme ancestors. Mr. Mayer next treats of the time of Hadrian's wall across the island, which he is of opinion was built to resist—not the comparatively few northern savages alone, but an alliance of these with the far more dangerous pirates of the North Sea. But irrespective of the fact that the plague of these rovers, as Mr. Mayer admits, was not heard of for nearly a century later, would not the alliance of the pirates with the savages have only



AN

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FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,
SANTARY REFORMER, AND ART-LOVER.

CONDUCTED BY

GEORGE GODWIN, F.R.S., F.S.A.

LATE VICE-PRESIDENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS;

*Honorary Member of various Societies; Author of "History in Ruins," "Town Swamps and Social Bridges,"
"Another Blow for Life," &c.*

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"Our English word To BUILD is the Anglo-Saxon Bylġan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PUDLEY.

"Art shows us man as he can by no other means be made known. Art gives us 'nobler loves and nobler cares,'—furnishing objects by the contemplation of which we are taught and exalted,—and so are ultimately led to seek beauty in its highest form, which is GOODNESS."

VOLUME FOR 1868.

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Hampton Court and York-place to foreigners; and, as far as internal evidence may be trusted, these buildings would appear to have been based altogether on English models. Hangings and furniture he purchased largely on the Continent, and thereby tended to introduce new types of ornament and art-manufactures into this country, which of course re-acted upon the style of national architecture. The only decided evidence of Italian art of the sixteenth century Hampton Court still shows, consists in the terracotta roundels, with busts of Hadrian and Trajan built into the towers of the eastern gateway of Wolsey's first Court, and others of the same kind in the adjoining Court. These have been attributed to Lino della Robbia, and are said by Mr. Cole (Felix Sumnerley) to have been given to the Cardinal by Leo X. As they are by no means like della Robbia's work, I don't feel the first assertion, and I am inclined to doubt the second, partly because Leo X. was no great patron of della Robbia's, partly because as gifts they would be scarcely valuable enough, and partly because other similar roundels and terra cottas exist in contemporary buildings in this country, as, notably, in the courtyard of St. Donat's Castle, Glamorganshire, one of which I engrave. Of those which once abounded in this country in Henry VIII.'s possession, and have perished, we are fortunately provided with sufficiently detailed descriptions to enable us to form a good idea of their general character.

We are indebted to Mr. Wornum for having printed, in the Appendix to his excellent "account of the life and works of Hans Holbein," copious extracts from the inventory of art "properties" preserved in the Palace of Whitehall, in the year 1547. Other extracts had been printed previously by Mr. Cole, Mr. Waring, &c. Amongst those entries are many which illustrate the general state of such contemporary art—as that patronised by the Cardinal at Hampton Court and elsewhere—very curiously. In the first place, there is to be noted the fact that what are called "pictures" appear to be bas-reliefs coloured, and more or less gilt, and made either of "erthe," i.e., majolica (as the roundels), or of black "towche," or touch stone. In the second place, what we now call pictures are all called "tablets;" and this title is adopted whether the "table" be an ordinary painting on wood or canvas, an alto relievo in alabaster or wood, a hanging in needlework, a plaque in enamel, a slab of marqueterie, or a specimen of glass-painting. The subjects of the "tables" are, with few exceptions, either portraits or ecclesiastical and devotional themes. In one or two instances only do "histories," taken from Ovid and other authors so popular with the masters of the early Italian Renaissance, make their appearance; and even in those rare instances they seem scarcely yet naturalised and at their ease, as witness the "stained cloth with Phoebus riding in his cart in the air with 'the history of him." Some of the pictures "made of erthe," may very probably have been the productions of Italians either in the king's or in his minister's employ, as they certainly executed such works in their own country, and there is no reason why they should not have done so here also.

It was in his noble palaces of York-place and Hampton Court, furnished with all the sumptuous hangings and adornments which he never seemed tired of seeking for abroad, that the great cardinal kept the high state and magnificence described by Cavendish, which was admired of all foreigners, and was even more royal than that maintained by his proud master. Thus sings old Skelton:

"The Kynges Courte
Should have the excellence;
But Hampton Court
Hath the pre-eminence:
And Yorke's Place,
With my Lord's grace,
To whose magnificence
Is all the confidence."

Probably Benedetto da Rovezzano and other Italians in Wolsey's service contributed to produce this stately "magnificence," which was so well understood and methodised in Italy through men like Bernardo Castiglione, author of the "Cortigiano," and was maintained with great punctilio in the Court of Rome; which was, no doubt, the great model followed by one, the "ultima Thule," of whose ambition was to occupy the chair of St. Peter.

In the pages of Vasari is to be found the biography of the eminent artist last mentioned, and it is unnecessary, therefore, to do more here than note that Rovezzano's works at

Florence, executed before he was tempted to enter the Cardinal's service, had earned for him a first-rate reputation. Those works combined architecture and sculpture; and prominently amongst them are to be remembered the chapel and shrine for the relics of San Giovanni Cualberto, proposed to be attached to the Church of Santa Trinita at Florence. The chapel which was added to St. George's Chapel at Windsor by the Cardinal, I need scarcely remind you, was intended to contain his tomb and monument, and it was to execute this work that Benedetto da Rovezzano was specially retained. He was assisted by Antonio Cavallari, and probably other foreigners; and worked, as we are told by Lord Herbert, from about 1524 to 1529. "The design whereof (he adds) was so glorious that it exceeded far that of Henry VII." After spending 4,250 ducats upon it, the Cardinal fell under the displeasure of the King, who, seizing upon his subject's palaces and other property, left him not even the poor "simlacra" he had destined to commemorate his unprecedented grandeur.

After the Cardinal's fall, he wrote from York asking the King to let him have his own figure for his tomb at York, with "such parts of his tomb as shall please the King." He also beseeched the King to send Anthony Cavallari, the glider of the tomb, back to Antwerp, and to permit "Benedict, the carver" to return to Italy. The King did neither, but used up the materials for his own tomb.

The services of Rovezzano were transferred from the Cardinal to the King, who endeavoured to adapt much of the work which had been done for Wolsey for his own monument. This, according to Nicholas Charles (Lancaster Herald), who left behind him the manuscript description of "The manner of the Tombe to be made for the King's Grace at Windsor," printed in Speed's "History of Britain" (p. 1083), was to be mainly of copper gilt. Upon two separate altars, or table-tombs of touchstone, the figures of Henry VIII. and his Queen, Jane Seymour, were intended to lie recumbent in their Royal habits, "not as death, but as sleeping," and of the size of a man and woman, with two angels at the head of each. "Upon a high basement between them, upon which shall be the history of St. George embossed, shall stand the King on horseback in full armor, of the stature of a goodly man, and a large horse. Over all, the Image of God the Father, holding the King's soul in His left hand, and His right hand extended in the act of benediction. Thirteen prophets and four saints, all 5 ft. high, and between each pillars of serpentine marble. The amount of the carvings—133 statues, and 44 stories, or bas-reliefs." Dallaway observes that: "In Henry VIII.'s will (dated 1546) this tomb is specified as 'an honorable tomb for our bones to rest in, which is well onward, and almost made therefore already.'" Had but the King's successors completed what was "so well onward," England might have now to boast a Royal monument, before which those of the Abbaye of St. Denis might "pale their inefficual fires." The bulk of what was done must have been very great, since the metal melted down and sold by the Parliament Commissioners fetched £200. I am inclined to fancy it possible that the beautiful statuette of St. George and the Dragon belonging to Mr. Louis Huth, which I have engraved, may have been a study for an equestrian group for this monument, superseded by the equestrian statue of Henry, above described.

Poor Benedetto's eyes were injured by working in the King's foundry, and he at length returned home rich; but doomed speedily to lose vision altogether (in 1550), and to die shortly afterwards. Of his fellow workman, Cavallari, we lose sight after the period of Wolsey's disgrace.

For a notice of the next artist upon our list, Vincent or Vincenzo Volpe, I am indebted to Mr. Congh Nicholl's admirable essay "On the Contemporaries and Successors of Holbein," printed in the 39th volume of the "Archæologia." After giving extracts from records proving Volpe's employment by the King in various branches of decorative painting, from 1514 to 1530, Mr. Nicholl adds: "I think it by no means improbable that Vincent Volpe may have been the painter of some of those curious military pictures, something between plans and bird's-eye views, that are still to be seen on the walls of Hampton Court. That he was an eminent artist is proved by the fact of his receiving wages equal to two-thirds of those paid to Holbein. Volpe is one of the very few eminent foreigners of this period who seem to

have escaped the notice of Virtue, Walpole, and Dallaway, to whom Englishmen have ransou to feel deeply indebted for the preservation of so much relating to the history of art in this country, in every way worthy to be had in remembrance.*

GHOSTS IN PICCADILLY.

"To be sold, the handsome Entrance Gateway and admired Stone Erection for the Colonnades at Burlington House."—*Adv't.*

"CARMAN, leave me here a little, while as yet 'tis early morn,
At this mansion old and famous, I will rest and view the form.
'Tis this place, and all around it, as of old, the shadows fall—
Upon colonnade and mansion with a smoke-begrimed wall."
"Stalwart porter, looking gloomy, reclining at the gate,
Doth muse upon the old time, or the future contemplat'g."
"I for olden times care little, and at trifles am not daunted;
The source of all my misery's a guard a house that's haunted
By the ghosts of the departed, who at eve when I'm a napping,
At my door and at my casement continually are rapping.
Jostling, pushing, quick they enter, for they're all in wondrous haste,
To revisit scenes so pleasant, where they met the 'Man of Taste.'
With swords, gold lace, and ruffles, and their coats of brilliant hue,
They lounge about the courtyard—a strange and motley crew.
There's Pope, the Waip of Twickenham, with Arbutnot and Gay,
Bygone times and scenes recalling as arm-in-arm they stray.
Of Handel—mighty master—of his sad and solemn strain,
Elysian transport to their souls—it thrill'd through every vein.
Of 'Burlington's fair palace,' and its famed 'delicious meal.'
Of balls and routs and junkettings, fond memories o'er them steal,
Hornes Walpole, smiling blandly, vows 'The colonnade, so bright,
Was the handiwork of fairies, and they built it in a night.'
Swift, who's rather airy, says, 'Mannars put it up for sale,
Till Hope† came to the rescue, and told a flattering tale—
Of its graceful form and beauty, and declared 'twould be a scandal
To destroy of Art a monument—he'd believe it of a Vandal.'
So gravely walking, softly talking, every topic they recall
That reminds them of the mansion with a smoke-begrimed wall.
Until Chanticleer, he crows, they vanish somewhat fluster'd.
And round about the gateway a chorus loud in utter'd:
O Sydney Smirke and Barry! O Banks and Pennethorne!
A worthy task's before ye, to excel its present form." X†

ON TRAPS FOR HOUSE-DRAINS AND GULLIES.

THE object of trapping house-drains and gullies is to prevent the foul air engendered in the sewers and drains from escaping into the houses and streets. The traps used for this purpose are of two kinds—namely, flap-traps and syphon-traps. The original flap-trap was similar to the old sluice-valve, and consisted of a door of wood or iron, fitted into a rabbeted frame, and hinged at top. The original syphon-trap consisted of a square brick box, with a stone placed on edge across the centre, and dipping 2 in. or 3 in. below the bottom of the drain. This was called the "bricklayers' trap." The flap-traps and syphon-traps so made were formerly used, either separately or in combination, for trapping the house-drains. The flaps were hung sometimes under the inlets, but chiefly on the outlets; while the syphons were placed under the inlets, and on the line of the drains, with flaps in addition at the outlets. The gullies were trapped by fixing flaps only on the ends of the drains in the sewers. The traps now employed for trapping house-drains and gullies are made on the principle of the old wood flap, on that of the old brick box with a dipstone, and by a combination of both; and the practice is to place the syphons under the inlets, and to hang the flaps on the outlets as heretofore.

* To be continued. † A. J. Beresford Hope, M.P.
† This is stolen very freely, you will perceive, from Tansy's, Pope, and Gay; so, although I sign myself very respectfully yours, you will at once recognise in me
A PLAGIARY.

THE TRIANGULAR LODGE, RUSHTON HALL.

Long ago we illustrated this singular building, and we have since, at different times, given other particulars of it. Mr. Thomas Powell, who has been examining it, writes,—"I have also had an opportunity of examining these very interesting papers and documents which, some thirty years ago, were brought to light by the pulling down of a wall at the hall. I have not been able to do more than turn my attention to the 'building accounts,' which form a portion of those very curious manuscripts, but I have been able to ascertain from them a few distinct facts, of which the following are some:—

The beautiful fabric at Liveden was commenced, and nearly finished, before the 'Triangle;' and the parties who constructed it were two named 'Gronbolds.' The Triangle was not finished in 1595, as is sometimes conjectured, from these figures, with the letters T, which are placed on the outside. The work was in progress in 1596.

The general stone material was raised at the white stone [and red stone 'pittes,' at 'Hawke fields.' The skunchions' (shields?) were from Pipwell.

Ordinary masons did the plain work, including the ashlar; but Freemasons executed all the symbolic matter. The names of both sets of workmen, together with those of the parties who did the windows, are given.

The Triangular Lodge has been mistaken for 'Wadener's Lodge;' they were entirely distinct fabrics, as appears from the building accounts; but of the latter there are, I believe, no remains.

During a great part of the time that both the fabric at Liveden and the Triangle were in course of construction, Thomas Tresame was in prison at Elis (Ely). To meet the cost of building, he sold, at intervals, lands at Clipston.

The 'spirit-rapping' did not occur in the Triangle. The building is simply the gratification of an exquisite taste in architecture, subverted by a deep religious trine enthusiasm.

The term 'triangle' is applied to the building by Tresame himself. I think an explanation of all the symbols might be found in the 'accounts.'

We should be glad to have the exact words in which the distinction between the ordinary masons and 'freemasons' is made.

HARVESTING IN WET SEASONS.

THE prize essay on this subject, by Mr. W. A. Gibbs, of Gillwell Park, Essex, has been printed in the Journal of the Society of Arts, which Society awarded the prize. We have already given an account of Mr. Gibbs's method of drying wheat, hay, &c., by means of the hot-blast, &c., and his own account is so lengthy and diffuse that our limits do not allow us to give any intelligible quotation from the essay; but we may give an account of his wheat-drier as constructed for the Duke of Sutherland, after remarking generally that the essay first of all gives particulars as to various modes of harvesting crops in wet weather in different countries. As to a mode recommended in our column to be used at a pinch, and where elaborate and costly 'wheat-driers' with their elevators, fans, furnaces, wheat-housers, hot blasts, engines, &c., were not to be thought of or attained, even had they been then invented, Mr. Gibbs speaks of it as "an absurdity," although he acknowledges that it was "the old Roman plan," and that it has been "partially revived in Australia," and is "the last resource of a forlorn hope"—where, of course his 'wheat-driers' are not even to be hoped for. To us it seems to be a still greater absurdity for Mr. Gibbs to present the country with such a system as his, by way of a solution of the problem how (short of at least half a century's progress amongst farmers in general) to harvest crops in wet seasons. The original suggestion in the *Builder*, by the way, was not the old Roman plan referred to by Mr. Gibbs, of beheading the corn "as it stands" in the fields, but after it has been cut and handed, and has stood waiting favorable weather which has never come. Then it is that the beheading process might perhaps best be done with sickle or with chopper, leaving the straw ready cut and standing as before, in the best possible position in the field for its preservation till drier weather should come. This original suggestion was certainly so far modified in our subsequent remarks

as to recommend, in very wet seasons—where it was desirable even to harvest the crop before the cutting of the straw—to save the heads at least, by at once reaping them where covered accommodation for drying straw and all was out of the question. Either of these modes, we will venture to say, will be adopted in nineteen out of every twenty cases, were one alone on Mr. Gibbs's system will; and for this plain and obvious reason, that out of every twenty farmers, either in this country, in Australia, or in any other country, for the next half-century, not more than that one is likely to be either able or willing to provide himself with Mr. Gibbs's "wheat-driers," on the chance of needing them for wet seasons. While describing his system, therefore, we venture to say that the grand problem of saving the crops of a country in wet seasons has not been solved by him, at least.

The "wheat-drier" referred to comprises a steam-engine, with cold and hot air blasts, a furnace, and a wheat-hous, covered and fitted with perforated cones on which the wheat is temporarily stacked, while the blast of hot air enters through the perforations and dries the bundles. The wheat is then taken to an elevator provided with a blast fan, also worked by the steam-engine, and which blast fan propels each bundle through a long and wide table or atmospheric hoist to the top of the stack where it is to be stored when thus dried.

By a modification of his process, rather cursorily and wordily described, Mr. Gibbs mentions that 45 lb. of "grass saturated with the heavy morning dew was dried into 9 lb. of bright green fragrant hay in fifteen minutes, by maintaining a steady temperature of 320° for the incoming air. This [he adds] was my first experiment with steam-power in lieu of hand labour; but I have since, with my smallest model, succeeded several times in drying grass in a similar condition into perfect hay in six minutes, using a temperature of 380° and a velocity of 1,650 revolutions per minute."

In conclusion, the author says:—

"If it be remembered that this new adjunct of the steam-engine begins its work with the first crop of hay, an next is applied to wheat, oats, barley, and the whole series of cereals, is then at hand to finish the second crop of hay, and enables us to dry the artificial grasses at any season of the year, it would seem as if it were destined, perhaps at no very distant period, to complete that perfect circle of systematic husbandry which now begins with the steam-plough and ends with the threshing-machine."

When continuous employment can once be found for the "iron horses," we may hope to see them on every considerable farm in the kingdom, first breaking up and cultivating the soil, next, mowing, reaping, and gathering the produce; and, finally, passing from field to field and from farm to farm, saving, drying, and bearing home the harvest."

Meantime, and till this good time has come (and no doubt it is coming), the world still wants some rough and ready means of harvesting crops in wet seasons.

THE INQUIRY AS TO THE FAIRFORD WINDOWS.

Sir,—In my former letter I alluded to certain specific differences that existed between the works of Albert Dürer and the Fairford windows. I shall now endeavor to show that the motives, the sentiment, and the principles under which both artists worked, were no less at variance. The artist of the windows was altogether an artist of the Middle Ages. He obeys the traditions, and confines himself entirely to the conventions of ecclesiastical art. His thoughts never stray out of their beaten path. His beauties and his defects are those of his school. The uncouth drawing that appears in the nude and lower extremities is not the result of youthful imperfection, but of the settled conviction of one who has not recognised scientific drawing as an artistic necessity. It is conventional, as is also his treatment of his subjects, and can be paralleled in abundant instances in the works of the Flemish school, in sculpture as well as in painting. The positive, quaint, almost melancholy air of the single figure of the prophet and apostles, pleasing as it is, is somewhat monotonous; no great distinction of character is attempted, by which the personality of the artist could be made known from amongst his contemporaries. Now in Albert Dürer we have quite a different man. He belongs to the *cinque-cento* school of art, rather than to that of the Middle Ages. Educated, as he must have been, with all the traditions of ecclesiastical art around him, he obeys them or neglects them at his pleasure. His ardent—nay his devoted—study of nature

appears in all his works, small or great. He is no conventional draughtsman, but one who has studied from the living model with a thorough knowledge of its anatomical construction. The splayed foot of the Flemish school, as in the Fairford windows, is impossible to Albert Dürer, and is not found in a single example known to be by his hand. It is equally impossible that so great a student of nature, animate and inanimate, could have drawn the ass and horses in the east window of the above-named church. His licence in the use of costume is like the freedom from restraint that marks him in every particular. He composes a costume for his Roman soldiers which is neither Medieval nor Italian, nor of his own time, but made up of all sorts of elements; so also of other figures. Energy and power are his chief attributes: he shrinks from no difficulty, but grapples with it, where others have avoided the contingency. Let us examine, as an illustration, his treatment of the subject of the "Agony in the Garden," as expressed in the "Small Passion." And here let me observe that, in alluding to this series, I do so on account of its being favorable for such examination. If the Fairford windows cannot bear this test, they have but small chance with the larger and more important works. Most artists, in the treatment of this subject, have declined to represent the anguish of that terrible hour. The figure of our Lord is usually shown merely as praying with the sleeping disciples about him. But here, the almost convulsively-clasped hands and bowed head speak with bitter truthfulness of the mental agony of the moment, expressed in the words, "Father, if it be possible let this cup pass from me." The pathos of this little composition finds no parallel at Fairford, and in his larger composition of the same subject A. Dürer again differs from himself and the ordinary treatment, whilst the artist of the windows keeps to the old path trodden before him. The architectural background must also be contrasted with those of the two works on "The Passion," because the difference between them shows that the minds of the two artists ran in diverse directions. At Fairford all the backgrounds are Medieval; in A. Dürer's, Classic, or quasi-Classic. The distinction is important, as it shows that, whilst the one extended his thoughts beyond his own time, the other was content to represent his subject, in true Medieval conventionalism, as if the occurrences were of his own day.

Whilst upon this subject, I may allude to Mr. Taylor's inquiry of Mr. Clayton respecting identity of background at Fairford with Nuremberg details.* The towers, &c., in the window may easily be illustrated in old towns on even the Lower Rhine, as at Andernach, as well as in the old Belgic towns. But a glance at Braun's views published in the sixteenth century will show that it is not necessary to travel much beyond the German Ocean to illustrate the scenic background at Fairford. Of the style of the canopies, I stated at the meeting of the Architectural Institute on the 6th inst. that not a single example of Nuremberg detail was visible there,—indeed, I exhibited a tracing from German glass in my possession, showing the distinction. I also stated my opinion that the canopies were distinctly Flemish.

Having thus stated what, in my opinion, are distinctive differences fatal to the attribution of the windows to the hand of A. Dürer, with whose special style I find no agreement, it may be interesting to point out other works of the same age in our churches, having a close analogy with them. In the north transept of the Abbey Church of St. Alban is a representation of the "Incredulity of St. Thomas," in mode of treatment and character similar to that at Fairford. Among the very pretty examples at West Wickham, Kent, perhaps a few years earlier in date, we find details similar to some in the windows under consideration. Such, for instance, as the sword in the hand of St. Catherine, crown, &c., and the head of St. Christopher will certainly compare with the best of those at Fairford. But the very curious series of wall-paintings in the Lady Chapel at Winchester Cathedral, though almost effaced, of great merit as designs, contain many indications of being executed by one of the same school and period. The urban worn by some female figures in the windows, as also the executioner in the "Judgment of Solomon,"—a remarkable and very distinct costume,—the ample skirts of the females generally, the broad-toed shoes, all ap-

* See p. 845, ante.