

Journal of the Society of Arts.

FRIDAY, JULY 24, 1863.

NOTICE TO MEMBERS.

Members will see, by the Report of the General Meeting of the 17th inst., given below, that additional subscriptions for carrying out the Society's Memorial of his Royal Highness the Prince Consort, are invited. Any member desiring to subscribe, or to increase his present subscription, is requested to send a Cheque or Post-office Order, made payable to Mr. Samuel Thomas Davenport, the Financial Officer.

The following subscriptions have been received since the last announcement :—

Blanchard, Mark Henry	£1	1	0
Clark, Gordon	1	1	0
Gurdon, William	1	1	0
Hart, Charles	1	1	0
Joske, Paul.....	1	1	0
Mouat, Dr. Frederick John	1	1	0
Newen, George	1	1	0
Odling, Dr. William, F.R.S.	1	1	0
Sparrow, Charles E.	1	1	0
Wells, Jonah Smith	1	1	0
White, William Foster, F.R.C.S.	1	1	0

THE SOCIETY'S MEMORIAL OF THE PRINCE CONSORT.

A General Meeting of the members of the Society was held on Friday, 17th inst., to receive a report from the Council in reference to the intended Memorial of the Prince Consort for the Society. Wm. Hawes, Esq., F.G.S., Chairman of the Council, presided.

The SECRETARY read the notice convening the meeting, and the following

REPORT OF THE COUNCIL.

The Council, in order to place the whole subject before the meeting, invite its attention to the former proceedings of the Society.

In March, 1862, the Society resolved there should be a fitting memorial of the Prince Consort placed in the Society's House, and the Council were requested to bring the subject before the members at a future time.

In February last the Society resolved that a subscription should be opened for a Marble Bust of His Royal Highness, and that in the event of the subscription exceeding what might be required for that purpose, the Council should report to a meeting of the members any new proposal they might desire to recommend.

A subscription, limited to one guinea from each member, was accordingly opened, and the amount subscribed up to this date is £683 4s. 6d.

The Council, during the progress of the subscription, ascertained that the cost of a Bust of

His Royal Highness, executed by a sculptor of eminence, would not exceed 150 guineas; but as the amount of the subscription accumulated rapidly, the attention of the Council was directed to the consideration of the most desirable mode of applying whatever surplus there might be after providing the Bust.

During the discussion on this subject, it was suggested that the completion of the decoration of the Society's Great Room, as designed by Barry, would be the most fitting appropriation of the surplus fund. This view the Council have adopted, and they hope that it will be approved by the members.

In Barry's original design the spaces at the end of the room, where the Portraits of Lords Romney and Folkestone are now placed, were to have been filled—one with a portrait of George the Third, and the other with a group representing Queen Charlotte superintending the education of her Family at Windsor Castle. Barry did not live to complete these pictures, but his intentions were accurately recorded in his own etchings.

It is now proposed to fill the spaces intended to have been thus occupied, with two pictures executed by distinguished artists in harmony with Barry's intentions, one to represent the Prince Consort holding in his hand the Charter of Incorporation of the Exhibition of 1851, and the other—the Queen, surrounded by the Royal Family at Windsor.

The Council have ascertained that these pictures can be obtained at from 600 to 700 guineas, and they have reason to believe that the sum required to provide both the Bust and the Pictures, together about £750, will be cheerfully contributed by the members, some of whom have already offered to double their subscriptions for this purpose.

The Council recommend that the Bust be executed by Mr. Theed, and the Pictures one by Mr. Cope, R.A., and the other by Mr. Horsley, A.R.A. Should these suggestions be adopted, the Society, by thus availing itself of the sister arts of sculpture and painting, will possess not only faithful representations of the features of him whose memory is so justly dear to it, but will be enabled to record, on the one hand, his great public act as President of the Society, and, on the other, the happiness of his domestic life as the Consort of our revered Queen.

Mr. W. H. BODKIN (Assistant Judge) said he cheerfully rose to propose the adoption of the report. Perhaps he was in some degree entitled to be prominent upon this occasion, because he believed it was upon his motion that it was decided that in case of the subscription exceeding the amount required for a bust, the matter should again be brought before the Society. When the discussion took place, at a former meeting, as to the best mode of doing justice to the memory of their late President, and when it was decided that a bust of his Royal High-

ness should be placed in this room, he (Mr. Bodkin) took the liberty of suggesting that if it was found necessary, owing to the amount of the subscriptions received, to depart from that mode of applying the funds, it would be desirable to come to the members again to sanction such a variation. He believed the report just read had most fully, and he hoped satisfactorily, explained the course which was proposed to be adopted, and that it was unnecessary for him to occupy the time of the meeting by going into the details. It appeared to him a happy idea to combine with the contemplated alterations and improvements of the room the completion of the design of the great artist Barry, to whom they were so much indebted. The two proposed pictures would be, he thought, more in harmony with the works of Barry than the portraits now occupying the space on each side of the room, which rather marred the effect of the great pictures themselves. In thus completing the original design nothing could be more happy than placing in one of those spaces the portrait of the Prince Consort with the charter of the Exhibition of 1851 in his hand; and in the other that of the Queen surrounded by her family, as emblematic of the domestic felicity which she had enjoyed. He therefore had great pleasure in moving that the report be adopted.

The motion having been seconded by Mr. ATKINSON,

The CHAIRMAN said, before putting the question he would express his regret that this undertaking had not been carried to completion by his worthy predecessor in the office which he now had the honour to fill. Sir Thomas Phillips had presided over several meetings in which this question was discussed, and had personally taken many steps with regard to it. He (the Chairman) had therefore to ask the meeting to receive from him the completion of the plan to which Sir Thomas Phillips so much contributed.

The report was then unanimously adopted and the meeting terminated.

ON JAPANESE ART.

The following is the substance of a Paper read by Mr. JOHN LEIGHTON, F.S.A., before the Royal Institution:—

Of all the marvels of Art and Industry collected at the International Exhibition in 1862, none excited greater attention or admiration from the reflective visitor than the contributions of Asia, including as they did the productions of India, Turkey, China, and Japan, and also of a host of islands—the inhabitants of which seem alike gifted with Art powers, indigenous to the soil on which they grow, as the gorgeous plants of the tropics flourish independently of care or culture; I allude particularly to that marvellous perception of form and colour, founded upon the laws of nature, and demonstrable by the aid of Science or the rules of Art, that seems the heritage of all Asiatics.

To the Dutch we are much indebted for keeping alight the feeble flame, the spark of European intercourse, that has never been allowed to die out, greatly to the benefit of all. Through this channel many things reached the court of the Tycoon, as others found their way *vid* the Netherlands, into Europe; yet the Hollander seems to have profited little by the æsthetic lessons of Japan. The *Cabinet Royal de Curiosités*, at the Hague, though a great source of attraction to strangers, is certainly not so interesting or instructive as it might be made—scarcely rivalling the *Musée Siebold* at Leyden. In matters of applied art the Dutch have not a refined taste; they have a good school of *genre* in painting, though none of either architecture or ornament.

In contrasting the arts of China and Japan, what strikes one forcibly is the marked difference of labour—the Japanese aiming to produce the greatest possible effect by the least expenditure of trouble, whilst the Chinese make

pains the principal virtue; they toil and spin, but lack inventive power, working from instinct rather than from the dictates of reason—a fault with all Asiatics, in greater or lesser degree.

The Japanese Court in the International Exhibition, though somewhat crowded, was beautifully arranged by Sir Rutherford Alcock, to whom we are indebted for the collection of objects, as also for those admirable volumes, "The Capital of Tycoon;" would that our envoys in remote corners of the world had done likewise, for I feel sure that in the islands of Formosa, Java, and Ceylon, are an infinity of objects of the rarest interest to Europeans.

The people of Japan, whilst they seek safety in seclusion, seem by no means to be blind to outward influence—to learning from any source. With all their love of feudalism and seclusion, the Japanese appear much more free in thought than their neighbours the Chinese, being a people who, though bound by strong tradition, are ever ready to learn, as many of their arts and manufactures clearly demonstrate. European influence is to be found in their fire-arms and ships; it has taught them linear perspective, as it will many other sciences; in fact, the horses that now shamble in shoes of straw, will gallop in iron, since Japanese chargers have been tipped with that metal, in imitation of some steeds that have found their way across the ocean.

I commence with architecture, because building is the primary office of man;—construction came before decoration, though the one can hardly exist without the other; the man who constructs a deal box produces a pretty ornament, at the same time making a dove-tail—



doubly beautiful, because it grows

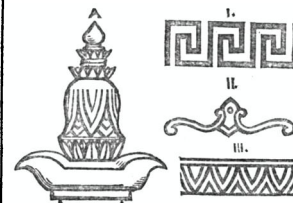
out of the construction; thus, construction and decoration go together.

As architects the Japanese have many difficulties to contend with; they build as their fathers built—not from conservative feeling alone, like the Chinese, but because the elements are against them. Earthquakes are of frequent occurrence there, rendering a wooden construction necessary—buildings that usually hardly rise above the dignity of a plain Swiss chalet—the gable finials and ridge tiles being, perhaps, the principal features of erections rarely higher than two stories, with galleries and verandahs—the doors and divisions of rooms composed of sliding shutters—the whole edifice resting upon a foundation of stone supported upon legs of wood, somewhat as a four-post bedstead stands; this form being best suited to resist concussions caused by the trembling earth.

The temples and gateways are of timber, with massive tent-shaped roofs, like the homes of the Tartars and Chinese, but with many details purely Indian; some of the edifices, as they stand upon their stone bases, reminding one strongly of the Assyrian restorations at the Crystal Palace; indeed, it is very curious to find many types from the ancient Egyptian, Assyrian, and Greek, perpetuated in the works of these remarkable people.

In my outline A is taken from a tomb, hundreds of which are to be found in their cemeteries; a treatment of

the sacred bean and lotus, so common in ancient Egypt, as also in India, the great seat of the Buddhist faith. Figs. 1 and 3 are purely classic. The Greek fret and echinus, or egg and tongue moulding are both used in China and Japan,



key patterns being the most popular. Fig. 2, in which scrolls are united in a bud, is also common, though more Assyrian than either of the others. These forms, with

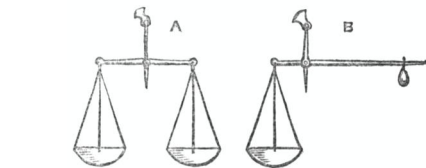
many beautiful renderings of the Anthemion, comprise their principal antique types.

As workers in stone, the Japanese are decidedly clever; though the nature of the foundations will not permit of nine-storied pagodas, they do wonders with their material; having a timber architecture—they imitate wood in stone instead of stone in wood and plaster, as we are apt to do; even in a semicircular bridge built of stone—the struts, planks, mortices, are all formed as if they were of timber.

In their architecture and sculpture devoted to the purposes of religion, the Japanese seek the aid of symmetry to give dignity, a majesty obtainable by no other means, a rigidity carried to the greatest extent in the works of the ancient Egyptians, though the Greeks and Romans were well aware of its powers. In ornamenting their secular objects, the Japanese

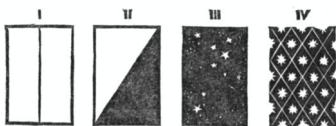
seem studiously to avoid exact repetition or a counterpart of lines, or, if they find them, do all they can by means of decoration to destroy an exact division or repetition of any portion. All other nations seek symmetry on principle, save these people and the Chinese, though the latter in lesser degree.

By way of illustration, I may say they shun an equality



of parts, or rather the appearance of an equality of parts, weighing with the steelyard B instead of the scales A. Justice with them is not even-handed; and, though they give weight in another way, they do not do so by diametrical division. Division, or repetition of parts, has been considered the acme of architectural and ornamental art, though not so of pictorial art, which must be more varied, and is, save in exceptional cases, where the high position or centre is appropriate to a deity or hero; in such the pictorial is subservient to the decorative.

Diametrical division the Japanese dislike. Fig. 1 has



not variety enough for them; they do all they can to get rid of a vacuum, as in Fig. 2, following the precedent of nature, who never repeats herself either in spangling the skies with stars or the earth with daisies of the field, as in Fig. 3. Diapers and conventionalized forms, as in Fig. 4, are not so popular with them as with us, who appreciate their value to break up surfaces and lead the eye to measure distances.

The arts of Japan may be said, in an eminent degree, to depend upon the picturesque, though rarely to reach the pictorial, that is to say, they never produce a picture, because the principal element of pictorial art is wanting; light and shade—a cloak with us that covers a multitude of sins—they know not of. Art of the highest kind may, and often does, exist without chiaroscuro; for instance, the divine compositions of Flaxman owe none of their world-wide fame to shade or colour. In their works may be observed the effects of light and dark, somewhat akin to that of chiaroscuro, rendered with much truth to nature, and a dignified simplicity that many of our artists would find it difficult to imitate.

In Japan we are told there are no academies of art, nor have the artists any status above that of the cunning craftsman; a hopeful thing, perhaps, for the future—nature's students standing the less chance of being fêted, lionized, or spoiled.

For powers of drawing, native examples vary greatly, though all are deeply interesting to the art-student, who may learn from the humblest specimens. The larger

coloured examples are very remarkable for a certain typical rendering of the human face divine, not to be found in smaller engravings or in nature, a droll sort of leer pervading all with an Egyptian uniformity; though, unlike the ancient examples from

that nation, perspective has taught the Japanese artist to draw faces in three-quarter view, and so vain does he appear of the power as rarely to deviate from it. Apart from defective drawing of heads, hands, and feet, the examples are very interesting, showing much good proportion, action, and drawing of drapery; whilst in colour they are very suggestive, some of the hues and patterns being handsome in the extreme.

The landscapes are very quaint, aerial perspective seeming beyond their powers, except in one or two cases where white mists have been attempted, as also rain, fog, and snow. In depicting clouds the Japanese artist seems sorely puzzled—the tinted ribbons they stretch across the heavens looking like labels for inscriptions rather than floating vapours.

The smaller samples, cut from their books, are full of



A, C, and D are from the smaller works; B, a typical mouth, from the larger.

fun and first-rate drawing, being quite equal in spirit to anything done here at the present day; aye, and done with few lines and marvellously little effort. Many of them have been engraved in Sir Rutherford's recent work; the larger efforts in colours show what the Japanese think of us and our ladies, crinoline of the amplest being faithfully depicted, as also beards, chimney-pot hats, and other peculiarities of the Western race. One of a lady in wide hoops, mounted on the wrong side of a native charger, is inexpressibly droll, showing what we may expect to behold if ever that sketch-book, so freely used last season by a member of the two-sworded embassy, should be published. Then shall we see London society as others see us, though I give the preference to native art on native subjects, particularly where there is action; for, curiously, some of the best are figures in movement—porters lifting, balancing, and carrying their loads; an acrobat poisoning his companion, a juggler; street-boys full of mischief, or weeping over broken dishes; mechanics at work; ladies bathing; and indeed a hundred-and-one phases of social and animal life. The lower portion of the creation are finely rendered, particularly birds in flight, ducks, geese, and cranes being hit off with wonderful precision by no ordinary marksman.

In composition they are good, two or more figures uniting in the production of admirable lines; though, like the early artists of other nations, the Japanese make their point of sight very high, all figures being as if looked down upon.

In colour, as a nation, they are very judicious, rarely producing discords, either in their attempts at picture-making or applied art—a thing that can hardly be said of either English or French. The British manufacturers, traders, and people in general, have but little love of co-

lour, though her painters and architects appreciate it highly. In France this is *au contraire*—her manufacturers and traders claim colour as an inheritance, but her painters disregard it, or place it as a minor accomplishment, the French school being one of form rather than colour.

Without attempting to solve this seeming paradox, I would here make note of another, and ask how it is fine styles of architecture and ornament seem, with the exception of ancient Greek art, never to have flourished with a perfect knowledge of drawing the human figure. With the revival of painting in Italy, purity of taste in matters of design died out. We know that Raphael painted the Loggia of the Vatican, but of what monstrosities and incongruities is it not composed. I just mention this by the way, as a warning against the Renaissance, and particularly the French version of it, that finds favour in certain quarters, to the exclusion of better things, whilst in India, Turkey, and Japan, we have an inexhaustible well of art, pure and undefiled, most eloquent in its teachings—an art that was appreciated by the great masters of mediæval times, all styles bearing evidence of the eastern forms and colours brought overland by the Pilgrims of the Cross.

With the spread of the Reformed religion, colour and design died out, being voted pagan and popish, antique figure-drawing and classic conceits taking their place, until light, shade, and pictorial effect reached its zenith in Rembrandt—the great genius of Holland—where black and white have triumphed over colour, form, and design. I think we may say that conventional art, including architecture and sculpture, was never lower than when the great school of *genre* and imitative art flourished.

In the East colour reaches its climax, as it tans the skin and renders man fit to support primitive hues, the love of which perhaps is to be found most highly in the negro, though in the Hindoo must be sought the subtle appreciation of it. Leslie has somewhere said, the only perfect specimen of colour he had seen was in a Chinese picture. What he would have said to these of Japan we can only conjecture,—colour with perspective, and shade nowhere.

We now come to sculpture, of which there is little evidence to show, though the Japanese are cunning carvers in stone, modellers, and metal workers, having a veritable passion for relief in everything; even their painted lacquer boxes are raised, the animals being very faithfully depicted, showing how they catch the salient peculiarities of nature in every case, be it in the beautiful miniature carving of an egg-shell (containing figures that must have been sculptured through the broken chinks), or a draught-ox reposing, the way the animal's legs are doubled up and disposed of being quite a study. Space being limited, I must content myself with mentioning the poetical combination of the whole animal kingdom in a dragon-vase, upon which the monster is wreathing in and out of thunder-clouds, a bolt in either claw. I do not hesitate to say that had this piece of poetry in bronze been worked on a grand scale, and placed on a pedestal, it would have found worshippers even here, so largely and grandly is it treated. This I can hardly say of a very large figure idol, of which I have seen a very small photograph. The proportions were good and pleasing, a calm serenity pervading the whole, without that combination of monstrous elements so common in Indian deities, to which it bore some resemblance.

Having disposed of the higher elements of genius in Japan, we now come to those phases of applied art by which a people become known to the future historian of art.

In art applied to manufactures, the Japanese stand very high, their versatility of thought being remarkable; rarely repeating anything by rule of thumb, or copying without some modifications. How different to the Chinese, where a tailor will reproduce a garment for you stitch by stitch, patches included; or where porcelain makers copy china vases, cracks, rivets and all. In their manufactures they studiously avoid symmetry (as I said before), and aim to condense the greatest variety in the smallest space, and, whilst they conventionalise, worship nature to the utmost

some of their ways being marvellously droll to us. This I will illustrate in the decoration of a very common box brought me by Sir R. Alcock. The lid of the article being square offended the Japanese eye, as it would any other eye properly constituted; decoration being sought, a line is drawn across the article, not horizontally or vertically, as any other nation would have done, but diagonally, because it produced the greatest variety at the



cheapest rate; the box being parti-coloured, the smooth surface of the lacquer is again broken up with irregular stamps, disposed in the most irregular manner (as in B). These devices I have contrasted with figures from India (A), showing how types begin to differ; forms that are in Japan lop-sided, become in India more symmetrical, and in Europe quite so.

Here, again, a book-cover, stamped, shows the same principle, being covered all over with representations of coins, relieved here and there by a dab of gold and a sprinkling of the like metal.

Volcanic eruptions and grand storms, doubtless, have had much to do with the perfecting that terrible myth the dragon, which is finely rendered, as are most of the animal and vegetable wonders depicted upon Japanese ware, all kinds of creatures being pressed into the service, and made to meet the wants of the article decorated. The manner in which flowers and birds are bent and twisted over surfaces is highly curious, as also the way they suggest ideas for shapes—sometimes so true to nature as to make one wonder at the draughtsman's skill, whilst in others so highly conventionalised are they as to make one doubt the authority. Hawthorn, bamboo, and rush are very common, as also cranes and tortoises, and landscapes touched in golden outlines.

Pattern upon pattern, and form upon form, are by no means uncommon in eastern art, but the way circular patches are placed upon frets and grounds is, I think, peculiar to China and Japan.

Small round ornaments are very popular in Japan, doubtless from the resemblance they bear to the crests or badges of Daimios—forms defended by law; hence their popularity amongst the people in general, as at home lions rampant and dragons displayed may be bought of every stationer.

It is curious that all these badges (Figs. A, B, C, D, E), or nearly all, should be derived from floral ornaments, Japanese heralds being guided by some principle—for in a first book for children, I find a popular badge in its con-



ventional form with the plant it is derived from, E. A red sun, or rather a red ball, as we should call it, is the emblem of the empire of Japan, also to be seen in the book, and upon an official document sent to the British legation at Yeddo, which shows, likewise, the insignia or crests borne by the Yakoneens or retainers of Daimios—guards in charge of our ministers to the court of the Tycoon.

As engravers upon wood and metal, the Chinese are known to have been skilled long before civilisation had dawned upon England, or even Europe had dreamed of tomes in black letter; but few, a year ago, would have ventured, I think, to claim the priority of colour-printing for Japan, yet this may be the case, for in no instance do

their specimens bear evidence of having been copied from anything done in the western world, being hand proofs, worked in flat tints, without a press, secondaries or tertiaries in very few instances being produced by working colour upon colour, as with us, who use no outline to indicate form.

Truly may we say there is nothing new under the sun, and particularly under the red sun of Japan, for here we have two recent inventions superseded, one being graduated or rainbow-printing, and the other some method by which blocks or prints can be reduced.

If the printing excites our wonder, what shall we say to the paper, for certainly we have nothing like that article, which plays so important a part in Japanese life, serving a hundred purposes unknown to us, keeping out the wind and weather from man and mansion, the windows and coats alike being made of that substance, which bears little resemblance to the rag papers of other parts—our own included. We import materials for paper manufacture from Japan, but not such as a native would use; the bark of the paper mulberry being much tougher than refuse rags, he wisely retains the former but vends the latter. The toughness and pliability of paper from Japan are surprising, especially in the thinner sorts, as, when held up to the light, it appears full of holes, the woolly fibre of which it is composed being distinctly seen. It is very light and absorbent, printers' ink penetrating the fabric, which, from that cause, has to be made double when bound up in a volume. How unlike our straw paper, so unpleasantly brittle, and disagreeably dirty when printed upon, ink merely lying on the surface; making one despair of seeing straw paper take the place of the finest Morocco leather, like the wonderful samples shown in the Exhibition of 1862, or do duty for the most delicate cambric, in the shape of pocket handkerchiefs, as paper does in Nippon.

I would warn collectors of articles from Japan to be careful in the selection of objects—where all are quaint and curious, quality sometimes escapes observation. I regret that we have no collection of the best products of this remarkable people, not a cabinet of curiosities alone, but a gathering of the ordinary articles of the country, selected by some men of judgment and taste, acquainted with our wants, who could explain things and their uses. A knowledge of the ingenious aids to education, books, toys, and instruments, would be most useful.

I am informed by Sir Rutherford Alcock, to whom I am indebted for many facts, that a really good collection of works, illustrating the arts and industry of Japan, could be obtained for £1,000.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The Thirty-third Meeting of the British Association for the Advancement of Science will commence in Newcastle-upon-Tyne, on Wednesday, the 26th of August, 1863, under the direction of the following officers:—President:—Sir Wm. G. Armstrong, F.R.S. Vice-Presidents:—Sir Walter Trevelyan, Bart.; Sir Charles Lyell, LL.D., D.C.L., F.R.S., F.G.S.; Hugh Taylor, Esq.; Isaac Lowthian Bell, Esq.; Nicholas Wood, Esq.; the Rev. Temple Chevallier, B.D., F.R.A.S.; Wm. Fairbairn, Esq., LL.D., F.R.S. General Secretaries:—William Hopkins, Esq., M.A., F.R.S., St. Peter's College, Cambridge; John Phillips, Esq., M.A., LL.D., F.R.S., Professor of Geology in the University of Oxford, Museum House, Oxford. Assistant General Secretary:—George Griffith, Esq., M.A., Deputy Professor of Experimental Philosophy in the University of Oxford, Jesus College, Oxford. General Treasurer:—William Spottiswoode, Esq., M.A., F.R.S., F.G.S., F.R.A.S. &c., 19, Chester-street, Belgrave-square, London, S.W. Local Secretaries for the Meeting at Newcastle-upon-Tyne:—Captain Noble, Augustus H. Hunt, Esq., and R. C. Clapham, Esq., 5, Grey-street. Local Treasurer for the Meeting at Newcastle-upon-Tyne:—Thomas Hodgkin, Esq.

The General Committee will meet on Wednesday, the 26th of August, at one p.m., for the election of sectional officers, and the despatch of business usually brought before that body. On this occasion there will be presented the report of the Council, embodying their proceedings during the past year. The general committee will meet afterwards by adjournment.

The first general meeting will be held on Wednesday, the 26th of August, at 8 p.m., when the President will deliver an address; the concluding meeting on Wednesday the 2nd of September, at 3 p.m., when the Association will be adjourned to its next place of meeting.

At two evening meetings, which will take place at 8 p.m., discourses on certain branches of science will be delivered.

There will also be other evening meetings, at which opportunity will be afforded for general conversation among the members.

The Committees of Sections will meet daily, from Thursday, the 27th of August, to Wednesday, the 2nd of September inclusive, at 10 a.m. precisely.

The Sections will meet daily, from Thursday, the 27th of August, to Tuesday, the 1st of September inclusive, at 11 a.m. precisely.

The following are the titles of the sections to which communications may be presented:—Section A. Mathematics and Physics. B. Chemistry and Mineralogy, including their applications to Agriculture and the Arts, C. Geology. D. Zoology and Botany, including Physiology, Sub Section D. E. Geography and Ethnology. F. Economic Science and Statistics. G. Mechanical Science.

Notices of communications intended to be read to the Association, accompanied by a statement whether the author will be present or not at the meeting, may be addressed to George Griffith, Esq., M.A., Assistant General Secretary, Jesus College, Oxford; or to Captain Noble, Augustus H. Hunt, Esq., and R. C. Clapham, Esq., Newcastle-upon-Tyne.

HAMBURGH INTERNATIONAL AGRICULTURAL SHOW.

This show, which was held recently, may be regarded as the most important Agricultural Show that has ever been held on the Continent; not forgetting the great shows held in Paris, because the German show, while quite equal in elegance of detail, was much more real in its character, being more largely supported by agricultural purchasers of both stock and implements.

German noblemen and gentlemen, owners and cultivators of estates numbered in thousands of acres, appeared there both as exhibitors of improved stock in almost every class, and as purchasers of the most expensive of modern agricultural machines. Hamburg has no direct agricultural interest, but although encircled by a series of foreign custom-houses raised to tax, for Denmark or the Zollverein, the articles which come free into the "Free City," it is nevertheless one of the great ports of Northern Germany, a sort of great bonded warehouse, in which enormous supplies are first lodged before being distributed by the net-work of railways branching through Prussia and Austria. The merchants, where not directly interested as landowners, have close relations with landowners—their customers in many shapes. Hamburg has also a close and constant connection with England, through London and Hull. The great trade that has grown up in cattle and sheep from the neighbouring state, Denmark, as well as Northern Germany, has every year more and more impressed the graziers of these districts with the necessity of adding quantity and quality to their stock by English crosses. It was under these circumstances that a few Hamburg gentlemen, headed by Baron Martens, who died suddenly before his great idea had been realised, determined to take advantage of the position and traditions of Hamburg, and hold an International

Exhibition, which should rival in importance the great fairs of the Middle Ages. For this purpose they raised, and most liberally spent, several thousand pounds. The undertaking must be interesting to Englishmen, because it derived no support from the Government treasury, but was, like our own most successful undertakings, entirely dependent upon private enterprise and voluntary contributions; and it was held in a city where all importations from every country are absolutely free.

From the moment the show was determined on the committee placed themselves, through Professor Wilson, in communication with the Royal Agricultural Society, and obtained all the results of the experience of English shows.

The showyard stood just outside the town, on a sort of turf common, and covered about 30 acres. At every shed was a spar, from which floated the flags and signals of every nation and city in the world. On each side of the entrance walls the poultry were arranged—not a very remarkable display; and next, on each side, three booths for agricultural produce. The archway was flanked by two arcades, under which fruit, and flowers, and vegetables were arranged. A small oval piece of ground between the arcades had been turned into a terrace garden, with a fountain, banks of green turf, and beds of flowering plants. Six sheds, three on each side of the entrance, were devoted to raw produce—wool, grain, wine, oil, beeswax, tobacco, cheese, butter, hemp, and flax, and silk, and all kinds of preserved fruits. The collection of merino wool was very fine. There were also models of rooms for silkworms, with cocoons hanging from a framework in mathematical regularity, a very curious and pleasing sight.

The live stock were arranged in parallel rows or streets, under capital sheds, with water laid on at each end; the sheep to the left and the pigs to the right of the entrance garden. Then came a broad street, with an orchestra dividing it, and on the opposite side the sheds containing the horned stock. The horses, a noble collection, were arranged in capital boxes, solid enough to have been permanent, with blinds to shade from wind and rain, in a half circus, or horse-shoe shape, with a large ring of grass for trial and exhibitions. The pigs were nearly all of English breed, or pure English crosses; white and black seemed in nearly equal favour. All the best English pigs were sold, and at great prices.

In sheep, the exhibition of Merinos was very numerous and fine. It included a pen from Vermont, in the United States. Valuable as merinos are, the constantly increasing demand for mutton is bringing our English breeds into well-deserved favour, Southdowns and Cotswolds having the preference. The cross of the Merino with the Cotswold is a favourite one. Southdowns were the best represented on this occasion. There were some pretty specimens of the Sussex Southdowns from the Duke of Richmond's flock, which were all readily sold at good prices. The German cattle salesmen supported the Hamburg Show in a most spirited manner, sending over some of the very choicest specimens of our choicest breeds, which they purchased for the occasion. Leicesters and Lincolns, with enormous fleeces, and Cotswolds, Oxford Downs, and Shropshire Downs, with some small, black-faced Scotch sheep, gave a pretty good idea of the variety of breeds required by the soil and climate of Great Britain.

In the show-yard there were the long lines of wooden sheds for the live stock, and the long lines of implements with the familiar sign-boards of Howard and Ransomes, Bentall and Garrett, Barrett and Andrews, Samuelson and others, so well known in England. The Americans were also well represented. There were steam engines and threshing machines by Clayton and Shuttleworth and others. The traction machines excited much interest and surprise.

It will be remembered by those who visited the Paris shows, that our larger classes of implements were seriously examined by very few Frenchmen, for the obvious reason that large farms are quite the exception in France. But at

Hamburg, landowners from Holstein, Mecklenburgh, and Denmark, from Silesia, Wurtemberg, and Bavaria, and from the German provinces of Austria, were attentive observers, and not inconsiderable purchasers, in spite of the enormous load of duties imposed by those countries.

In the corn-growing districts of the Continent, from north to south, one or more steam-driven threshing machines have become indispensable on every estate, in order to take advantage of distant corn-markets. Many a foreign nobleman, who formerly grew a few acres of corn for local consumption, now, stimulated by railroad conveyance, grows hundreds of acres, which all the men in the district could not thresh in time for market.

The confidence displayed by foreigners in British workmanship and British integrity was most remarkable, and was shown by the readiness with which purchases were made. The trials of Burgess and Key's, Samuelson's, Wood's, and M'Cormick's reaping machines were followed with much interest; although the season was rather late for purchases. The same reason still more interfered with the hay-making implements. A fair business was done in ploughs, harrows, chaff-cutters, and turnip-slicers. Howard's horse-ploughs seemed as well known at Hamburg as at home.

The foreign de of the implement yard contained nothing of an agricultural kind except copies of English machines and tools of very inferior workmanship. The centre of attraction on the German side was a building of artificial stone, in which stood an artificial horse, on which, from time to time an exhibition of trotting in the German style was given.

Amongst the firms exhibiting was Mr. Garrett, a son of the well-known head of the firm at Leiston, who has established a factory at Magdeburg, in Prussia, and makes every kind of English implement and machine in demand. The Germans appear to estimate the value of machinery as follows:—First, if they can afford the price, they prefer an English machine; next, a machine from the factory of an Englishman settled in Germany; and last, the productions of their own countrymen, who apparently can copy, but cannot fit. This is very curious, because the more you talk to the German workmen and mechanical labourers, the more you are struck with their superiority over our men in literary and theoretical education. All the workmen seem to have some scientific knowledge. They can most of them draw a sketch by way of explanation, and yet they cannot do what the Japanese do in perfection—make a good fit and fine finish to their work.

The Prussian duties on agricultural implements are oppressively high, but the Russian Government, more enlightened, has reduced the duty on that class of machinery to a merely nominal rate, while in the principalities of Wallachia and Moldavia there are no duties at all on agricultural machinery. The consequence is that the landowners, having this threshing power in their hands, sow whole square miles of wheat, thresh off in the field, burn the straw, and send the corn in home-made carts, which never return, drawn by home-grown ponies, hundreds of miles—some of them have as many as ten sets of threshing machines and steam engines—away to the Danube. These same boyards, or princes, are now going into reaping machines, and some of them will, no doubt, take up steam cultivation.

In cattle, the prizes were for Shorthorns and for Ayrshires, and for English and Scotch breed being neither Shorthorn nor Ayrshire. Mr. Crisp took the first prize for the best aged Shorthorn bull, and the best Shorthorned heifer, and the second prize for heifers. Mr. Honke, of the Metropolitan Market, took the first prize with First Fru its, with which when a calf the late lamented Jonas Webb carried off the gold medal as the best bull in the yard. There were no Devons shown, although there is a Danish breed of small red cattle which would certainly breed and improve with a cross of Devon bulls. Some black-poll Scotch cattle carried off prizes, and were much admired by the foreigners. In thoroughbred stal-

lions suitable for improving the breed of well-bred horses for various purposes, there were 17 entries, eight being the property of English exhibitors. The first prize went to Vortex, the second to Harleston.

The class for Arabian stallions brought 16 entries, some very beautiful animals. The prize went to one 29 years old, which for years had been daily carrying a man of seventeen stone, on the ground that he was the very highest type of Arab. The King of Wurtemberg also sent a pair of very beautiful mares, one a flea-bitten gray, pronounced by competent English judges to be perfect. Out of 217 stallions, 33 were exhibited by Englishmen, and 29 mares out of 274, but a very large number of the foreign entries were of pure English blood. Altogether, the show of stallions, except thoroughbreds, was better than any ever made at the English shows. Many of the Mecklenburghers were magnificent. Mr. Holmes, of Beverley, took a prize for a hunting mare, and sold her to a Hamburg merchant.

The carthorses were very good. Mr. Crisp took three prizes for Suffolks, the first and second for the best horse for agricultural purposes, for the best hunting mare, and a second prize for a pony. It was understood that the Clydesdales from Windsor took a prize. Nearly £400 was taken at 3s. a head to see the steam ploughing. Three of Fowler's sets were in the field, one worked by Fowler, the other two by Ransomes and Richardson, and Garrett had one of Howard's system in operation. The ground was a piece of old tough grass with a subsoil of morass beneath. As a trial it was absurd, for there was not above an acre each. Under these circumstances it is enough to say more than that the work was well done by Fowler's sets. Howard's plough received some serious injury on the journey from England, which when set to work so increased that it would not steer in one direction, and competition was out of the question. However, Mr. Sutton, Messrs. Howard's representative, worked on with great energy under this most discouraging circumstance, and was rewarded by a medal "for the system." Fowler obtained the first prize and the gold medal, and Ransomes one for their application of Fowler's system. This firm also obtained a medal for their collection. Out of ten gold medals five or six went to the English exhibitors; one to Clayton and Shuttleworth for their combined steam driven barn machinery; two, as before observed, for steam cultivation. There was a trial of reaping machines, in which Samuelson, Burgess and Key, and Wood took part.

The English judges were Professor Wilson, Mr. Wetherby, Mr. Robert Smith, and Mr. Barthrop.

The accompanying statement, translated from the catalogue, will give an excellent idea of the importance of the show, and of the relative position of our countrymen. It will be seen that our implement exhibitors numbered one-fifth, and our live stock one-sixth of the total numbers entered, and certainly we obtained a fair share of prizes. In pigs, for instance, Mr. Crisp, who carried off 17 prizes in all, had four first and two second prizes for his own black breed and for Berkshires. Mr. Sexton, besides prizes for Cotswolds, had four prizes for young black and young white boars and sows. Mr. Fisher, representing Mr. Wainman, carried off three first and three second prizes for his large white and middle-sized breeds, and sold off all the stock he had to sell at high prices. The other two gentlemen made great sales. In sheep, Mr. Wood, representing Lord Walsingham, besides carrying off the South Down prizes, sold all the sheep he had for sale, one ram at a hundred guineas. Lord Kinnaid took a first, and Mr. Gebhart, of London, a second prize for Scotch polled stock; Mr. Guerrier, of the Metropolitan Market, the prize in the class for crosses of Downs with an Oxford Down. Mr. Fowler took the prize for Alderneys, which, however, did not set at all, the climate not suiting. The Cotswolds were also sold. The Lincoln sheep did not seem to take.

The following is the number of entries from different

states:—From Anhalt—3 rams. Brunswick—3 bulls; 4 cows, 5 heifers, 13 rams, 14 ewes, 3 wethers, 1 boar, 8 sows. Denmark—1 stallion, 1 mare, 4 bulls, 1 cow, 2 heifers, 3 rams, 3 ewes. The Duchies—24 stallions, 16 mares, 2 Galloways and ponies, 37 bulls, 66 cows, 72 heifers, 43 rams, 77 ewes, 4 boars, 6 sows, 4 young pigs. France—6 stallions, 1 cow, 17 rams, 48 ewes. Great Britain—33 stallions, 29 mares, 5 Galloways and ponies, 63 bulls, 25 cows, 44 heifers, 135 rams, 265 ewes, 25 boars, 34 sows, 30 young pigs. Hamburg—32 stallions, 48 mares, 6 Galloways and ponies, 24 bulls, 30 cows, 31 heifers, 35 rams, 81 ewes, 14 boars, 23 sows, 10 young pigs. Hanover—52 stallions, 147 mares, 18 Galloways and ponies, 33 bulls, 135 cows, 61 heifers, 4 oxen, 55 rams, 90 ewes, 13 boars, 22 sows. Hesse Cassel—1 bull, 1 ram, 6 ewes. Lippe (Principality of), 2 stallions, 4 mares. Lubeck—1 mare. Mecklenburgh Schwerin—23 stallions, 9 mares, 7 bulls, 3 cows, 3 heifers, 22 rams, 41 ewes, 3 wethers, 3 boars, 9 sows, 12 young pigs. Mecklenburgh Strelitz—2 rams. Netherlands—4 bulls, 37 cows, 9 heifers, 2 rams, 24 ewes. Austria and Dependencies, or Crown Lands—4 stallions, 22 bulls, 24 cows, 27 heifers, 10 oxen, 88 rams, 58 ewes, 10 wethers, 2 boars, 4 sows. Oldenburg—7 stallions, 5 mares, 18 bulls, 15 cows, 25 heifers, 1 ram. Prussia—24 stallions, 10 mares, 2 Galloways and ponies, 22 bulls, 21 cows, 13 heifers, 18 oxen, 293 rams, 233 ewes, 15 boars, 18 sows, 26 young pigs. Russia—2 stallions, 2 mares. Saxony—3 bulls, 5 cows, 6 heifers, 4 oxen, 26 rams, 34 ewes, 6 wethers. Saxon Duchies—2 bulls, 2 cows, 3 heifers. Sweden and Norway—2 stallions. Switzerland—4 bulls, 9 cows, 3 heifers. Spain—1 stallion, 1 ram, 2 ewes. United States of America—3 rams, 9 ewes. Wurtemberg—4 stallions, 2 mares, 7 rams, 3 ewes.

Total numbers.—Horses: 217 stallions, 274 mares, 33 Galloways and ponies—524. Cattle: 245 bulls, 378 cows, 304 oxen, 36 heifers—965. Sheep: 750 rams, 994 ewes, 22 wethers—1,766. Pigs: 77 boars, 134 sows, 82 young pigs—293.—Total 3,548.

The numbers of exhibitors of Agricultural Implements and Machinery from different States were:—From Anhalt, 3; Baden, 1; Bavaria, 2; Belgium, 1; Brunswick, 4; Denmark, 3; the Duchies, 21; France, 10; Great Britain, 73; Hamburg, 61; Hanover, 46; Hesse Cassel, 1; Hesse Darmstadt, 2; Lubeck, 1; Mecklenburgh Schwerin, 15; Mecklenburgh Strelitz, 1; Netherlands, 3; Austria and Dependencies, 17; Oldenburg, 1; Prussia, 52; Saxony, 7; Saxon Duchies, 2; Sweden and Norway, 12; Switzerland, 1; United States of America, 6; Wurtemberg, 4.—Total 350. Machinery and Implements 2,941.

MANUFACTURE OF SALT IN TURKS ISLANDS.

The following communication, with enclosures, has been received from the Secretary of State for the Colonies:—

Downing-street, 13th June, 1863.

SIR,—I am directed by the Duke of Newcastle to transmit to you, for the information of the Council of the Society of Arts, the copy of a despatch from the Lieutenant-Governor of Jamaica, with one from the President of the Turks Islands, furnishing details upon the manufacture of salt as practised in that colony. His Grace desires me to state that these papers are communicated to the Society of Arts in case they should have any information to give to the President, or any means of promoting the inventions sought for.

I am, Sir,

Your obedient servant,
C. FORTESCUE.

P. Le Neve Foster, Esq., M.A.,
Society of Arts, Adelphi.

[ENCLOSURES.]

King's House, Jamaica, March 9th, 1863.

MY LORD DUKE,—With reference to your Grace's despatch, No. 182, of the 31st of December, 1862, I have

now the honour to transmit a despatch received from Mr. President Moir, furnishing such details respecting the manufacture of salt in the Turks Islands as he has been enabled to gather.

I have, &c.,
(Signed) E. EYRE.
His Grace the Duke of Newcastle, K.G., &c., &c.

Government House, Grand Turk, 16th February, 1863.

SIR,—I shall now endeavour to furnish, in compliance with his grace the Secretary of State's despatch, No. 182, dated 31st December, 1862, such details respecting the manufacture of salt in this colony as I have been enabled to gather from written and oral communications since my recent arrival at Grand Turk.

2. To assist any particulars I may be enabled to give, I have the honour to enclose a tracing of this island, showing the several salines and canals, coloured blue, which will explain the position and extent of the salt ponds now under, if I may make use of the term, cultivation.

3. It is apparent from that drawing that the salines are situated at various distances from the sea, from which they all, with one exception, receive the supply of water necessary for the production of salt. That exception is the pond marked "Hawk's Nest," which is furnished with natural salt springs, which rise in the reservoir, separated from the "pans" hereafter described. The others receive a supply of water by means of canals, dug from the principal reservoirs to the sea, and which are furnished with flood gates.

4. The bottoms of these reservoirs are on about a level with low-water mark, and, when the "salt season" is about to begin, have a liberal supply of sea-water admitted to them for the purpose of "pickle" or "brine," being produced by means of the evaporating powers of heat and wind; while this process is being accomplished, and generally about the month of March, the lessees of the various salt ponds proceed to throw off into surrounding dams the rain or other water which may have collected in the "pans" during the winter, or since the last raking, by means of circular hand water fans, and "wooden rakes," so called, but in truth instruments of wood, precisely similar in shape to that made use of in England to scrape the mud from the public thoroughfares. The pans are then thoroughly cleansed of any mud and slime which may have accumulated on the bottom, and are, if the weather be fine, exposed to the sun's rays for two or three days to harden or bake. This process, and a large supply of water in the reservoirs there being gradually prepared for introduction into the pans, are most important requisites for securing a good and clean crop of salt. The extent of reservoir ought to be in the proportion of three to one of the pans attached or dependent on each reservoir.

5. During the two or three days when the pans, which are of sizes varying from one-eighth to half an acre, are being exposed, and as opportunities permit, the division banks, formed of stones and mud, are carefully repaired, and, all preliminaries having been completed, the "pickle" or "brine" from the reservoir is turned into the "pans," or, should the pans not be close enough, into narrow water-courses, leading to the more distant ones, and thence, by means of the circular water fan already referred to, into the pans, which are thus covered with brine to the depth of from eight to eighteen inches.

6. The sun and wind then do their part, and as in England it is the wish of the sportsman to hear of "a southerly wind and a cloudy sky," so in Turks Island the prayer of the salt-raker is—

"A cloudless sky,
And the wind blowing high,"

both of which contribute to the realisation of his hopes—a deposit to the depth of from one to four inches of the salt, specimens of which I shall do myself the honour of forwarding to his Grace with this despatch.

7. By the salometer the pickle commences to granulate at 96, sea-water being indicated on the scale by the

number 12; and while between the higher number and 100, the remaining brine is thrown off, and what is termed "raking" then commences.

8. Should the lessee, through carelessness or from other causes, neglect to throw off this brine, and rake at the proper period, two other crystallisations would take place, viz. :—1st. Muriate of soda, or common salt; 2nd. Sulphate of soda, or Glauber's salt; 3rd. Sulphate of lime, or gypsum. Specimens of the two latter I shall endeavour to procure to forward with the other crystal.

9. The cake, of from one to four inches, formed at the bottom of the pan, having been exposed, it is broken up by means of a heavy-headed iron rake, gathered by the wooden scraper into longitudinal ridges, and conveyed in mule carts to the several places of deposit for shipment. This breaking up and raking are parts of the process which are capable of much improvement. I have now at my disposal the sum of £100, a part or the whole of which will be paid to any one who will furnish this government with the best working model of a machine or machines, suitable for breaking up and raking salt. I have great hopes that the inquiry now instituted by his Grace may be the means of attracting the inventive intelligence of machinists in Great Britain and the continent of Europe to this subject; and I need not add how grateful I should be if his Grace would cause any new feature in the manufacture of the staple of this colony, which may be elucidated in the course of this inquiry, to be communicated to your excellency for the use and benefit of the salt-rakers in these islands.

10. From two to six "crops" can thus be gathered within the six months after the middle of March, everything, however, depending on the absence of rain and the power of the sun and wind. At Cockburn Harbour, East Caicos, which is supplied by magnificent natural springs, the lessee has been so fortunate as to rake the same pans once every fortnight, for some considerable time. The average annual yield of an acre of salina is 8,000 bushels, and in the United States of America, our principal market, the salt from this colony is considered superior to any which can be procured elsewhere, and is invariably used by that Government for preserving their salted meats. The price here has varied within the last few years from three pence to four pence sterling per bushel, containing thirty-five imperial quarts.

11. This production is liable, I am told, to a "disease" which sometimes renders the labours of one or more seasons almost valueless. I suspect, from what I can collect on the subject, that the danger lies in some neglect of the formation at the bottom of the salt pond, but I am unwilling to communicate to his Grace any opinion of mine that might possibly mislead. I therefore content myself at present with sending a specimen of a healthy formation; and when I find I can write with more knowledge of this part of the subject, I shall do myself the honour of supplementing this hasty report, and if possible transmitting specimens of the unhealthy brine, or of the formation in the pans, for chemical analysis.

I am, &c.,

ALEXANDER MOIR, President.

His Excellency Lieut. Governor Eyre, &c.

THE GUARANA OF BRAZIL.

In a paper read by Mr. T. C. Archer, before the Botanical Society of Edinburgh, in April last, that gentleman furnished the following particulars respecting *Paullinia sorbilis*, Mart, and its products.

There is no more remarkable plant in the order Sapindaceæ, if regarded from an economic point of view, than *Paullinia sorbilis*, although as a plant it is not well known to the botanical world. From its large seeds is manufactured the substance called Guarana, which is extensively used in Brazil, Guatemala, Costa Rica, and other parts of South America, as a nervous stimulant and

restorative. The seeds, deprived of their coverings, are pounded into paste, which, hardened in the sun, constitutes Guarana. It is used both as a remedy for various diseases, and also as a material for making a most refreshing beverage; and it adds another of those incidents so puzzling in human history, of the discovery of these qualities in plants least likely to be suspected; such, for instance, as that of the leaves of tea, the seeds of coffee and cacao, the leaves of twigs of the various American Ilexes, and other plants, should have this wonderful restorative effect on the nervous system, and that this should not be a mere vague notion, such as attaches to thousands of other plants, but that it should really depend upon the presence of a chemical principle the same in all, and the operation of which can be satisfactorily explained. The presence of an alkaloid, which he called Guaranine, was discovered some years ago in Guarana by Dr. Theodore von Martius, of Erlangen, but its identity with Theine was soon established, and subsequent analyses, especially one by Dr. Stenhouse in 1856, proved that not only was the active principle of Guarana identical with Theine, but that, as far as is known, no other substance yields it so abundantly, the amount being 5.07 per cent. as against tea, which yields 2.13 per cent., and coffee from 0.8 to 1.00. The mode of using the Guarana is curious and interesting. It is carried in the pocket of almost every traveller, and with it the bony palate of the large fish (*Sudas gigas*), locally called "pirarucu," the rough surfaces of which form a rasp upon which the Guarana is grated, and a few grains of the powder so formed are added to water, and drank as a substitute for tea. The effect is very agreeable, but as there is a large portion of tannic acid also present, it is not a good thing for weak digestions. Its remarkable restorative power has given it a further great reputation as an aphrodisiac.

Another species of this genus, *Paullinia cupana*, also enters into the composition of a favourite national diet-drink. Its seeds are mingled with cassava and water, and allowed to pass into a state of fermentation, bordering on the putrefactive, in which state it is the favourite drink of the Orinoco Indians.

The tree is abundant in the new province of Amazonas, where the seeds are collected, reduced, and prepared in mass, and sold to the Bolivians, who use it largely. It is also sent to the provinces in the South. There is exported annually from the city of Santarem, about 500 arrobas, or 16,000 lbs., valued at 8d. or 9d. per lb.

Specimens of the Guarana were exhibited in the Brazilian Court, made by the Indians of the Amazonas, who not only prepare it for their own use, but for conveyance to Para, Matto Grosso, and Goyaz, where it finds a ready market. It is made from the seeds of a low wide-spreading tree, which grows abundantly along the banks of the Upper Tapajós, Rio Negro, and other tributaries of the Amazonas, as well as in Guiana and Venezuela. The fruit is scarcely as large as a walnut, and contains five or six seeds; these are first roasted, then mixed with a little water, moulded into a cylindrical form the size and shape of a large sausage, and dried in an oven, in which state it is known as an article of commerce. It is grated into a powder by means of a rasp (the bone before alluded to), which was shown in the Exhibition. Two spoonfuls of this powder are mixed in a tumbler of water; this is considered to be a very refreshing drink, and regarded as a stimulant to the nerves, and, like strong tea or coffee, is said to take away the disposition to sleep. It is exported from the Rio Negro, where it has been purchased for 1d. per lb.; in 1851, 3,500 lbs. of Guarana was exported from Para, which was there valued at 13d. per lb. In the Exhibition six different preparations made in Vienna, from Guarana, were exhibited in the Austrian Court. It has been before observed that Dr. Stenhouse ascertained that it contained a quantity of a principle first called Guaranine, but which has been found to be identical with Theine, the principle to which both tea and coffee owe their invigorating

qualities. The same principle, in the amount of 1½ per cent., also exists in the Yerba Maté, the celebrated Paraguayan tea, which consists of the dried leaves of some species of *Ilex*.

The powdered seeds of the *Paullinia* are said to have been employed with much success, by French medical men, in cases of headache. They furnish by analysis a small quantity of resinous matter, starch, tannin, and guaranine.

THE FRUIT TRADE.

Messrs. Adolfo Pries and Co., of Malaga, give the following report, under date of 15th ultimo:—

"We are glad to be enabled to give our this year's summer report with very favourable prospects for a good stock of fruit.

"After very dry weather during the winter months, we had it in May very fresh and humid, and the vines to-day look generally better than for many years past, especially for Muscatel raisins, as these vines have least suffered by oidium during past years, and an unusually fine crop is in prospect. There are vines around Malaga with 20 to 25 bunches of Muscatel grapes, so luxuriant as to double the produce of ordinary seasons. Old stocks of Muscatels in boxes have been shipped during the last two months at rising prices to England and North America. The remaining stocks do not exceed to-day 30,000 boxes of only ordinary fruit on layers; better sorts, as also bunch, are quite exhausted. The result of the last year's crop amounted to 1,250,000 boxes, which have been shipped as undernoted:—

	Boxes.
To the United States of North America ...	400,000
To the United Kingdom	250,000
To France	160,000
Consumption of our Interior	150,000
To South America	50,000
To Canada, California, and Melbourne ...	50,000
To Russia	15,000
To Portugal... ..	15,000
To Italy	12,000
To Holland and Belgium	18,000
To Germany	12,000
To Denmark, Sweden, and Norway ...	6,000
Packed in barrels, and shipped to the North of Europe and North America, equal to	80,000
Stocks on the spot	32,000
Total... ..	1,250,000

Against 1,500,000 boxes in the previous year; and according to the present state and prospects of this new crop, we think we are not wrong if we estimate the yield to be about two million boxes, or 25,000 tons. Moderate prices will therefore be established, especially after the first wants for early and quick shipments are covered, but for these, prices may open not so very low.

"The stocks here, as also on the principal markets of consumption, will be almost entirely exhausted by the time the new crop is ready, as in spite of the unfavourable commercial and political circumstances in the United States of North America, the consumption of our raisins is almost to be counted as one of the most necessary wants. For other sorts of Muscatels, we hope certainly to see established lower prices than in the late former years. With the large crop anticipated, selections may be made with more care for satisfying, at accessible prices, the yearly-increasing demand. The selected first qualities will be always high in price, but the better middle sorts must be purchased at less exorbitant prices than of late years.

"As to raisins in barrels, say small Muscatels, long and Garoon raisins, there is an equally good crop. The last year's export of these descriptions did not exceed 30,000

barrels. We think that about double this quantity may be exported this year.

"Figs promise a very rich result. Of what quality the crop may prove must be decided in July or August, according to the weather, but at present very moderate prices seem to be certain for this fruit.

"Almonds—both the fine long Jordan and the true Valencia and broad ones from here promise only a middling crop. There are no old stocks of Jordan almonds. We do not expect, however, for this kind, with a reduced demand, high quotations, while the Valencia and our broad fruit might be higher in price than last season."

The stock of dry fruit in the London bonded warehouses on 30th June, 1863, and on the corresponding date of the previous year, was as under, according to Messrs. Murton and Webb's statement:—

		30th June, 1862.	30th June, 1863.
Currants	... tons	10,000	8,500
Raisins—Valencia	... "	650	14
	Smyrna (red)	400	590
	Sultana	... packages 25,244	... 25,870
	Muscatel	... " 9,245	... 42,786
Figs—Turkey	... "	11,284	22,667
Almonds—Jordan	... boxes	2,251	2,519
Prunes	... barrels	98	375
"	... cases	71	56
Plums	... "	692	22
Dates	... barrels	—	6
"	... cases	107	43
"	... mats	954	12,197

EXAMINATION PAPERS, 1863.

The following are the Examination Papers set in the various subjects at the Society's Final Examinations, held in May last:—

(Continued from page 592.)

NAVIGATION AND NAUTICAL ASTRONOMY.

THREE HOURS ALLOWED.

Only one question to be answered in each section.

I.

1. June 17, 1863, the observed meridian altitude of α Serpentis was $29^{\circ} 50' 40''$ (zenith south of the star), the index error of the sextant was plus $4' 20''$, and the height of the eye above the sea 24 feet. Required the latitude.

2. On February 4, 1863, about 4h. 50m., A.M., mean time, in latitude $51^{\circ} 20' S.$, longitude $124^{\circ} 10' W.$, the sun bore by compass $N. 84^{\circ} 56' E.$, and the observed altitude of the sun's lower limb at the same time was $6^{\circ} 30' 10''$, the index error plus $1' 15''$, and the height of the eye above the sea 15 feet. Required the variation of the compass.

II.

1. September 19, 1863, in latitude by account $53^{\circ} 10' N.$, longitude $56^{\circ} E.$, the following double altitude of the sun was observed:—

Mean time nearly.	Chronometer.	Observed altitude lower limb.
7h. 30m. A.M.	5h. 15m. 22s.	$21^{\circ} 20' 30''$
10h. 15m. "	8h. 0m. 31s.	$37^{\circ} 0' 20''$

The run of the ship in the interval was N.N.E. $\frac{1}{2}$ E. 20 miles; the index error was plus $3' 20''$, and the height of the eye 30 feet. Required the true latitude of the place of observation.

2. August 23rd, 1863, at 9h. 40m. P.M. (mean time nearly), in latitude $30^{\circ} 10' N.$, and longitude by account $22^{\circ} 50' W.$, when a chronometer showed 11h. 4m. 20s., the observed altitude of α Pegasi east of meridian was $43^{\circ} 32' 20''$, the index error was plus $2' 0''$, and the height

of the eye above the sea was 20 feet. Required the longitude. On August 1, at noon, the chronometer was slow on Greenwich mean time 5m. 40s., and its daily rate was 3.7s. losing.

III.

1. Prove that meridian distance is equal to the difference of longitude multiplied into the cosine of the latitude.

2. Prove that $\tan \text{course} = \frac{\text{diff. longitude.}}{\text{mer. diff. latitude.}}$

3. Prove that meridional parts of the sphere = $\log. (\cos. \text{half latitude}) \times M.$

IV.

1. Required the compass course and distance from A to B:—

Lat. A $49^{\circ} 30'$ } Variation $2\frac{1}{2}$ W. lon. A $2^{\circ} 20' E.$
 " B $49^{\circ} 30'$ } S. Deviation $8^{\circ} 50' W.$, B $3^{\circ} 40' W.$

2. A ship sails from latitude $67^{\circ} 10' N.$, and longitude $10^{\circ} 15' W.$, S. by W. 35, N.N.W. 22, E.N.E. 17, S.S.E. 14 miles. Required the latitude and longitude arrived at.

3. A ship steams 11 knots an hour, and her apparent course is W. by S., what is her true course and distance in $4\frac{3}{4}$ hours supposing a current drifting N. $\frac{3}{4}$ E. $2\frac{1}{2}$ knots an hour?

V.

1. Explain what is meant by the Polar Triangle, and demonstrate its chief properties.

2. In a right-angled spherical triangle, given the hypotenuse and one of the adjacent angles, find the other two sides.

3. State and prove Napier's Analogies.

VI.

1. What is meant by mean time and sidereal time? and show how one may be converted into the other. Ex. What is the sidereal time at a place whose longitude is $125^{\circ} W.$ of Greenwich, on June 11, 1862, at 3 h. 40 m. local mean time.

2. The following errors of a chronometer, from mean solar time at noon, at each place were determined viz.:

- Port Royal, Feb. 9th, + 5h. 13m. 5.0s.
- Alta Vela, Feb. 20th, + 4h. 52m. 34.5s.
- Port Royal, Feb. 28th, + 5h. 13m. 44.3s.

Required the longitude of Alta Vela, the longitude of Port Royal being $78^{\circ} 50' W.$, the rate of chronometer being supposed to be uniform; also state the principal methods of finding the longitude by observations.

VII.

1. Show how to find the hour angle or meridian distance of a star from the observed altitude. How is it determined whether it is east or west of the meridian?

2. Explain the method of finding the latitude by meridian altitudes.

3. Investigate a method of clearing a lunar distance.

- Ex. Apparent altitude sun's centre $23^{\circ} 5'$.
- Apparent altitude moon's centre $49^{\circ} 16'$.
- Apparent distance of the centres $75^{\circ} 42' 25''$.
- Horizontal parallax $54' 47''$.
- Find the true distance.

VIII.

1. Describe the sextant, and explain the principle on which it is graduated.

2. What are the principal adjustments of the sextant? and describe the observations for the determination of the index error.

PRINCIPLES OF MECHANICS.

THREE HOURS ALLOWED.

1. What are the different kinds of force which enter into statical investigations?

2. Investigate the two conditions fulfilled by any number of forces, acting on one point in a plane, which are in equilibrium.

Two rafters of a roof (whose weights are not to be taken into account) are inclined to their tie-beam at an angle of 60° ; at their common top is suspended a weight of 10 cwt.; find the strain of the tie-beam.

3. Prove the ratio between the power and weight of a smooth heavy body at rest on an inclined plane.

Supposing the plane to be rough, show how the ratio is altered.

What is meant by "the limiting angle of resistance" in this case?

A mass of iron weighing 500 lbs. rests on a perfectly smooth plane inclined at an angle of 30° to the horizon; what strain must a bar in the plane sustain that prevents it sliding down?

If the plane be of oak (for which the limiting angle of resistance is 30° nearly), what force parallel to the plane will be required just to drag it up?

4. Describe the different systems of pulleys, and state the excellencies and defects of each.

In a system of pulleys, in which each pulley hangs by a separate string, there are three pulleys of equal weights; the weight attached to the lowest is 96 lbs., and the power is 33 lbs.; find the weight of each pulley.

5. Describe Attwood's Machine, and show how the three laws of motion are illustrated by different experiments on the machine.

Two weights of 63 and 64 ounces respectively, are hung over a nearly frictionless pulley by means of a fine silk string; determine the spaces described by these weights at the end of 1, 2, 3, 4 seconds.

6. Explain the terms "centre of oscillation," "centre of percussion," employed in dynamics.

A mass of oak swung from a horizontal axis makes 43 oscillations in a minute; where is its centre of percussion?

7. What is meant by "the moment of inertia," and "radius of gyration" of a body about an axis?

Find them about the axis on which a grindstone revolves, which is 4 feet in diameter and 8 inches thick.

8. State and prove the two conditions fulfilled by a floating body. What third condition is necessary that its flotation may be stable?

A cube is placed in a liquid four times its density; show that there are three positions in which it will float with only one edge in water.

9. Describe the action of a common pump; point out the practical defects, and the limits to its working.

Why does the labour of working it increase at every stroke until it discharges water?

What other pumps may be used where the common pump fails?

10. Describe the syphon, and explain by it the action of intermittent springs.

11. Give the chief features in the construction of an aneroid barometer.

12. Describe a diving bell.

A diving bell, of the form of a cube 10 feet each way, is sunk to a depth of 400 feet; how far will the water enter at first?

13. Investigate the strain at each point of a flexible chain hung from two horizontal points,

How will your investigations affect the construction of suspension bridges?

14. Show that the most general motion of any free rigid body may be represented by two co-existing motions.

PRACTICAL MECHANICS.

THREE HOURS ALLOWED.

1. Describe the single-acting steam-engine invented by Watt to remedy the defects of Newcomen's atmospheric engine.

2. Sketch in section the cylinder, piston, and steam-valve of a double-acting steam-engine, and explain the manner in which the admission and exit of the steam is regulated?

3. What is meant by working an engine expansively, and how is it accomplished? If the steam be cut off when the piston has completed one-fourth of its stroke, show that the work done in the cylinder is more than half that which would result from maintaining the full pressure of the steam until the end of the stroke.

4. Explain the "parallel motion" of a beam-engine.

5. You are required to give some account of the construction of a locomotive engine and boiler, and to point out the peculiar merits of Stephenson's invention.

6. Explain the following mechanical contrivances:—(1) A ratchet-wheel; (2) a mangle-wheel; (3) an escapement; (4) a fusee; (5) bell-crank levers; (6) the Geneva stop.

7. What is the usual arrangement of the train of wheels in an eight-day clock? How is the motion of the last wheel controlled?

8. Mention some contrivances which exhibit motion of a compound or aggregate character. Explain the sun and planet wheels invented by Watt to impart motion to the fly-wheel of a beam-engine, and show that the fly-wheel makes two revolutions for each double stroke of the piston.

9. You are required to explain, in general terms, the construction of a machine for planing iron, and to describe the mechanism employed for obtaining the necessary movements.

10. Describe some form of self-acting drilling machine

ELECTRICITY, MAGNETISM, AND HEAT.

THREE HOURS ALLOWED.

1. Illustrate and explain the terms, magnetic attraction, repulsion, and induction.

2. What is meant by the terms *Isoclinical lines*. Explain the mode of distribution of terrestrial magnetism.

3. Name the most strongly diamagnetic bodies, and state the nature of their properties.

4. State the leading properties of electricity as excited by friction.

5. What is an electrophorus? Explain its action.

6. Give some account of the means employed to protect ships from lightning, and of the conditions essential to efficiency.

7. What is meant by "quantity" and "intensity" in a voltaic battery, and for what purposes are those qualities respectively most available?

8. Explain the structure and action of De Luc's or Zamboni's pile.

9. By what means may the magnetic properties of a voltaic current be demonstrated? State some practical applications.

10. By what means can a thermo-electric be readily demonstrated, and what are its peculiar features?

11. Describe the structure and action of the electric organs of some fish.

12. Explain the relation between muscular action and a voltaic current.

13. Explain the construction of some one working submarine cable.

14. What is the object of a *relay*? Explain the construction of some efficient one, and, if you can, of some one that is employed in practice.

15. Explain the difference between *conduction* and *convection* of heat. Give some practical illustration of convection.

16. State the principal means employed in measuring heat, and the chief sources of error.

17. If a boiler, heated up to 200°C ., bursts, would the whole of its contents, or what proportion of them, fly off in steam?

18. Illustrate the undulatory theory of heat by showing experimentally the application of the laws of reflection.

19. Explain the "Dew point," and the best instrumental means of observing it.

20. Explain the difference in the sensible warmth or coldness of different bodies at the same temperature. Apply this principle to clothing.

(To be continued.)

Home Correspondence.

RESIDENCES OF CELEBRATED MEN.

SIR,—The *Times* reports the inquiries which Mr. W. Ewart made in the House of Commons, on Friday the 17th of July, as to the possibility of marking those houses in London with the names of the celebrated persons who had inhabited them. Thus he instanced that "Milton lived in a garden house in Petty France, now No. 19, York-street, Westminster; Newton's house, in St. Martin's-street, south-side of Leicester-square, was now an hotel; Dryden died at No. 43, Gerrard-street; Prior lived in Duke-street, Westminster; Sir Joshua Reynolds lived in the centre of the west side of Leicester-square; Hogarth lived in part of the Sablonière Hotel; Flaxman, at 7, Buckingham-street, Fitzroy-square—his studio was still there; Dr. Johnson died at 8, Bolt-court, Fleet-street; Goldsmith, at 2, Brick-court, Temple; Gibbon, at No. 7, Bentinck-street; Garrick, at the centre house, Adelphi-terrace; the great Duke of Marlborough died in Marlborough-house; Lord Somers's house was still in Lincoln's-inn-fields; Lord Mansfield lived in King's Bench-walk; Samuel Rogers lived in St. James's-place; and Lord Macaulay in the Albany. Other nations were in the habit of preserving memorials of their great men, and there was no reason why we should not follow their example." Many other residences might be instanced, such as those of Stephenson, Brunel, and Locke. If the principle be adopted, its application should not be limited to the Metropolis, but extended to provincial towns.

Mr. Cowper, the First Commissioner of Public Works, agreed in thinking that it would be desirable to be able to recognise the spots where persons of eminence and fame had resided. He pointed out that the matter "might fall within the function of the Metropolitan Board of Works, but still that it was the right of the owner or occupier of a house to write upon it what he pleased, and it might not be desirable to compel a man to place upon his house the name of a person who did not then live there. Some persons like to put their own names on a brass plate upon their doors, and might not wish to have the name of an eminent departed personage there."

The subject appears deserving of attention, but it is obvious that whatever is done should be of a voluntary character. Therefore, it seems undesirable that either the Chief Commissioner of Works or the Metropolitan Board of Works, or even parochial authority, should interfere. But it seems to me a proper subject for the Society of Arts to consider. The object in view is of public interest, and refers especially to celebrities in Arts, Science, Manufactures, Commerce, and Literature.

The Council might communicate with the owner or occupier of the premises, and, having obtained his concurrence, might, from its own funds, provide the necessary tablet, which, I should recommend, should not be a brass plate on the door, such as Mr. Cowper hints at, but some kind of decorative tablet, which might be executed in terracotta. It might also be ornamental, and of a character which would decorate the outside of any house, and therefore desirable for the occupier to have.

I am, &c.,

HENRY COLE.

PHOTELECTRIC ENGRAVING.

SIR,—In bringing my process of engraving photographs, Photoelectric Engraving, before the notice of your Society, I am desirous of making a few observations of a general nature. In consequence of the very questionable protection afforded by the Patent Laws, I deem it advisable at present not to publish the details of my process. I have already sacrificed much to the "idea" of engraving photographs, and as I believe I have now solved the problem in a satisfactory manner, I am naturally anxious to remunerate myself. At a future time I may make a proposal, the effect of which, if agreed to, will be to enable others to work my process.

From the encomiums passed by highly qualified judges on the specimen I now submit*—Kenilworth Banqueting Hall, from a photograph by Bedford—I think I am warranted in saying that I have solved the problem of successfully engraving photographs. But I should not consider myself entitled to the merit of this discovery were the specimen above mentioned touched up by the graver, or even the result of a happy chance. I am glad to be in a position to say that the specimen has only required careful cleaning, and that unless my head and my hands fail me, the result is certain. I can guarantee to produce, in a period varying from one to three weeks, an engraved plate from a photograph. In this plate, that which constitutes the essence of the photograph and the despair of hand labour—*fac-simile* even to minute and almost microscopic detail—shall be present. To attain this result, all that I require is a good reversed negative (easily produced by reversing the glass), and a positive print merely fixed with hypo, not toned.

The methods which have hitherto given most promise are the bitumen process, photoglyphy, and photogalvanography. The other processes of photolithography and photozincography, from their very nature, cannot rival the richness of plate printing. The bitumen process and photoglyphy are essentially etching processes, and involve much hand labour and consequent loss of fidelity. Photoglyphy is the least satisfactory of the two, as the etching ground employed is of a very delicate nature, and the photographic chemical, bichromate of potash, has the unfortunate quality of destroying detail, the longer it is submitted to actinic influence.

The most important step in advance was photogalvanography. This process came into my hands when in a most crude and impracticable condition, and after it had been given up as useless by others. By much patient labour I succeeded in making it practical, and the process has ever since been worked with the improvements which I effected. I was not permitted to reap the fruit of my labours, and after a considerable sum had been expended, by my then partners, to develop the process in a direction to which it was wholly unsuitable, the process has been almost abandoned.

Photogalvanography, like photoglyphy, depends on the peculiar action of bichromate of potash, in combination with gelatine. In this lies its weakness. It loses detail—the more so as it requires a very long exposure, sometimes upwards of six hours, and then without any certainty that the right exposure has been attained. There are consequently numerous failures from this one cause alone.

I experimented long with this process, and found that the result was due to chromic acid. In other words, that with a composition merely of chromic acid and gelatine, a raised image with granulation could be produced. From this raised image the electrotype plate was subsequently made. Independently of the loss of detail, and the uncertainty in the exposure—both defects inherent in the process—the granulation was of a peculiar zig-zag and wiry character, which was of great value in the vigorous parts of the picture, but became broken or unconnected in the half-

* The specimen may be seen at the Society's House, on application to the Secretary.

tones and fine details. This led to a pretty free employment of the graver and roulette, just in the very parts which made hand-labour expensive. The process, indeed, was never capable of the high flight which was attempted, and, as I predicted, it broke down. Where expense was no object, the graver was a great assistance, but it lessened the value of the *fac-simile*.

In photoglyphy and photogalvanography, the results are obtained from a positive impression.

It was after experimenting some time with photogalvanography that it occurred to me to strike out in a different direction. Anyone acquainted with engraving is aware that aqua-tint and "chalk" or stippling, produce fine grain, half tones, and detail. The problem I set myself was how to imitate this combination. The aqua tinter employs common resin dissolved in spirits of wine. This poured over his plate evaporates, and leaves numerous globules of resin attached to the surface. The size of these globules depends on the proportion of resin to spirit. When the acid is put on the plate the resin acts as a resist, and a tint is produced in the intermediate parts. If the plate were now electrotyped before the removal of the resin, and a print taken from the electrotype, the resin parts would give a kind of stipple or "chalk" marks, interspersed with tint. It is something similar to this which I have succeeded in imitating, with peculiarities *sui generis*, by photography and the electrotype. I can also, as it were, modify the size of the dots, obtaining them so fine as to carry almost microscopic detail; but if too fine there will be deficient depth in the dark. In this as in all things there is the happy medium, and this I believe I have secured. I commence with the negative. This should be reversed. From the negative a positive proof is taken; this I prefer not toned but merely fixed in the sepia colour by the "hypo." I cover the negative, which must be varnished with a material from which I obtain a latent positive. This latent positive I turn by a simple process into a suitable negative, and it is with this negative that I subsequently manipulate. I can time the exposure to a nicety, a few seconds over or under making an inappreciable difference. The excess or deficiency must not however extend to minutes. If necessary I can electrotype direct upon my material; but as this might lead to the discovery of part of my process, I prefer to make a different kind of matrix.

I should have been glad to have taken out a Patent in order to grant licences, but as the lawyers say no Patent is valid till well litigated, I prefer to run the risk of competition, which after all is of more benefit to the Arts than monopolies such as the present Patent Laws permit.

Trusting I have not trespassed unduly on your space,

I am, &c.,

DUNCAN C. DALLAS.

Proceedings of Institutions.

HALIFAX WORKING MEN'S COLLEGE.—The annual report for the eighth year says that the principal characteristic of the past year is steady hard work, which has, in its turn, been the forerunner of a most successful and creditable examination, creditable not only to the students by showing the extent of their knowledge and its accuracy, but reflecting also an honourable light on their teachers. The Committee tender their most sincere thanks to those to whom the success of the Institution is almost entirely owing, viz., to those engaged in the work of teaching. A branch at Copley has been lately incorporated in connection with the Haley-hill Working Men's College. The elementary class for adults has been abolished, as it was found that practically it did not act as a feeder to the Working Men's College; certainly, however, from no fault of the teacher, who was unremitting in his exertions to forward the class. The theological class has this year been attended by some of the most intelligent of the students, the regularity of whose attendance far surpassed

that of any other in the College. The class in book-keeping still keeps up its number, and continues as great a favourite as heretofore. The singing classes have been discontinued (at any rate for the present) partly on account of the pressure of work on both College and Institute, arising from the new educational code, and partly from the apathy shown by many of the members. The Society of Arts' Examinations continue very popular, as they furnish a good and true standard by which to measure the yearly progress in the different subjects. The science classes, though not so numerously attended as they ought to be in such a large manufacturing town as Halifax, have produced very satisfactory results. In the Examinations held in May last, by the Department of Science and Art, out of 24 candidates 23 passed, and eleven received prizes for chemistry and physics. The Young Women's Institute never was in a more satisfactory condition. During the past year the times of attendance have been altered from three to four nights per week, and this has had a good effect. The attendance has been much greater since the alteration, and the progress of the young women has also been in a proportionate measure increased. Needlework, one of the most important subjects, has this year received its due share of attention. Pupils and teachers have alike striven to achieve one result, viz., a most creditable display of plain needlework. There is a class for the repairing of clothes, which has already been productive of some good. The dressmaking class still continues its useful work, and in several instances the members have thankfully acknowledged the great benefits they have experienced from the instruction given. The recreation ground was never so well attended, and the effect was visible in the students in the greater energy which they threw into their studies. The total number on the books is 197; number admitted since Easter, 1862, 199; average nightly attendance, 100; average weekly attendance, 136; Copley branch, number on the books, 26.

NEWCASTLE-UPON-TYNE CHURCH OF ENGLAND INSTITUTE.—The Ninth Annual Report of this Institute states that very considerable progress has been made during the past year. The treasurer's account shows that the state of the finances is satisfactory, although a considerable sum of money has been expended to increase the advantages offered to members. The resources available for the year were materially augmented by the proceeds of the annual *soirée*, which was held in the new Town-hall, under the presidency of the Worshipful the Mayor of Newcastle (Joseph Armstrong, Esq.) Many new members have been added during the year. The number is now 350. During the year 246 additional volumes have been added to the library. The total number of books is 2,684. The annual circulation has reached 7,500 volumes. The Council pay special attention to this important department, and they will continue to supply as many works as possible of general interest. Every season the lectures have increased in popularity. The room is now filled upon each occasion. The course for the past winter was as follows:—Rev. Canon Prest, M.A., "India"—Rev. R. F. Wheeler, M.A., "The Post-office"—Rev. S. A. Herbert, B.A., "Sketches from the History of the Jews in the Dark Ages"—Rev. C. H. Banning, M.A., "The English Jew in the Nineteenth Century"—Rev. Vyvyan H. Moyle, "A Popular View of Church Architecture"—F. R. Wilson, Esq., A.R.I.B.A., &c., "The Military and Monastic Life of the Middle Ages in Northumberland." The following classes are in operation:—One for the study of French; one for vocal music; and one which has recently commenced, a discussion class, for the mutual improvement of its members. Several members and associates have again obtained certificates in various subjects at the Examinations of the Society of Arts. Upon the whole, the Council can look back on the past year with satisfaction; and they hope to be enabled, during the present year, with the assistance of the members, to make the Institute still more worthy of the mission upon which it has entered.

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

Delivered on 8th July, 1863.

- Par. Numb.
404. Coals, Cinders, and Culm, &c.—Account.
409. Dockyards—Admiralty Order.
412. Burlington House and Gardens—Returns.
180. Bills—Landed Property Improvement (Ireland).
212. " India Stock.
213. " Fortifications (Provision for Expenses).
214. " Fisheries (Ireland) (amended).
Delivered on 9th July, 1863.
389. Holyhead Old Harbour—Return.
393. Post Office—Return.
408. Mail Contracts (West Indies)—Copy of Correspondence.
215. Bills—Metropolitan Main Drainage Extension.
216. " Railway Bills (No. 2).
217. " Sydney Branch Mint.
218. " Promissory Notes and Bills of Exchange.
219. " Navy Prize Agents, &c. (as amended in Committee, and on Re-commitment).
220. " Alkali Works Regulation (amended).
Railways in India—Report by Juland Danvers, Esq.
Sanitary State of the Army in India—Report of the Commissioners.
Delivered on 10th July, 1863.
388. Joint Stock Companies (Limited)—Return.
400. Fisheries (Ireland)—Return.
420. Railway Trains (Redhill)—Returns.
419. Army and Militia Services (1861-2)—Return.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette, July 17th, 1863.]

- Dated 28th April, 1863.*
1067. J. H. Johnson, 47, Lincoln's inn-fields—Imp. in apparatus for preserving property in case of shipwreck. (A com.)
Dated 7th May, 1863.
1146. C. A. Day, A. Lamb, and T. Summers, Southampton—Imp. in marine engines.
Dated 12th June, 1863.
1475. J. F. Tone, Newcastle-upon-Tyne—Imp. in the prevention of smoke in steam boilers and other furnaces. (A com.)
Dated 13th June, 1863.
1482. R. Blackburn, Exeter—Imp. in traction engines.
1485. J. S. Benson and D. Jones, Birmingham—An improved construction of removable head for casks, applicable to the closing of other vessels.
Dated 15th June, 1863.
1498. R. W. Gordon, Belfast—Imp. in machinery for spinning flax and other fibrous substances.
Dated 17th June, 1863.
1523. E. Wolf, Sambrook-court, Basinghall-street—A new or improved wrapper or wrapping material for use in smoking tobacco.
Dated 18th June, 1863.
1525. J. L. Ganne, Cour-Cheverny, France—Imp. in toy pistols.
1527. D. Barker, Milton-street, Wandsworth-road, Surrey—Imp. in the treatment and preservation of yeast.
1529. E. Ivett, Bedford—Improved machinery for the manufacture of tiles.
1531. E. Gossiaux, Laeken, near Brussels—An improved machine for making bolts, rivets, and spikes.
Dated 19th June, 1863.
1533. E. Howarth and J. Brown, Tonge, near Middleton, Lancashire—Certain imp. in apparatus for steaming cotton or other fibrous substances.
1535. R. Marrison, Great Oxford-street, Norwich—Imp. in breech-loading fire-arms.
1537. A. Morel, Roubaix, France—Imp. in machinery for combing wool and other fibrous material.
1539. J. Watts, Coventry—Imp. in machinery or apparatus for the manufacture of malt.
1541. W. E. Newton, 66, Chancery-lane—Imp. in the manufacture of leaden pipes. (A com.)

Dated 20th June, 1863.

1543. T. Smith, Tenter-lane, Leeds, T. Moore, Upper Mills, Wandsworth, near London, and M. Burrell, Kings Mills, Leeds—Certain imp. in the construction of reels covered with silk or other suitable material used as machines for the purpose of dressing flour.
1545. D. D. Kyle, Victoria-street, Westminster—An imp. in baths.
1547. R. Brownlee, Glasgow—Imp. in sawing machinery.
1551. J. L. Clarke, 45, Westbourne-terrace, Hyde-park—Imp. in apparatus for turning the leaves of music and other books.
1553. F. Jenkin, Duke-street, Adelphi—An electric tell-tale compass.
1555. W. L. Winans and T. Winans, Dover-street, Middlesex—Imp. in the construction of steam vessels.
1557. W. L. Winans and T. Winans, Dover-street—Imp. in adapting propellers for propelling ships or vessels for ocean navigation.
Dated 22nd June, 1863.
1566. F. Boulton, Liverpool—An improved method or process for obtaining patterns and designs for the arts and manufactures. (A com.)
Dated 1st July, 1863.
1636. T. Boyle, 31, Gray's-inn-road—An improved system of ventilation applicable to every description of dwelling place and building.
Dated 2nd July, 1863.
1646. R. A. Brooman, 166, Fleet-street—Certain compositions for protecting metals and metallic articles from oxidation, and for coating slate, bricks, pottery, and ceramic ware. (A com.)
1648. E. Lloyd, 22, Wells-street, Saint Marylebone—An improved composition for waterproofing, softening, and preserving all kinds of leather and articles made therefrom.

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

1701. G. Haseltine, 12, Southampton-buildings, Chancery-lane—Imp. in lever horse-power machines, the cog-gearing employed being applicable to other machines. (A com.)—8th July, 1863.
1752. H. A. Bonneville, 24, Rue du Mont Thabor, Paris—Imp. in certain descriptions of breech-loading fire-arms. (A com.)—13th July, 1863.

PATENTS SEALED.

[From Gazette, July 17th, 1863.]

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|---------------------------|----------------------|
| <i>July 17th.</i> | 210. F. N. Gisborne. |
| 177. J. W. Meears | 222. A. J. Saxe. |
| <i>July 16th.</i> | 226. W. F. Stanley. |
| 145. L. Verdure. | 232. H. H. Henson. |
| 178. A. Phillips. | 243. H. B. Barlow. |
| 192. H. Caro and J. Dale. | 260. H. Crichley. |
| 198. J. M. Binger. | 274. W. Clark. |
| 206. J. Milner. | 791. N. R. Hall. |
- [From Gazette, July 21st, 1863.]*
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| <i>July 18th.</i> | 342. J. Cameron. |
| 11. J. E. Baker and J. Landon. | 400. W. C. Paul & A. T. Shore. |
| <i>July 21st.</i> | 480. H. Mackinder. |
| 209. C. Stopford. | 667. W. Wood. |
| 223. R. A. Brooman. | 786. G. F. Key. |
| 237. W. Bollason, jun. | 929. R. Reeves. |
| 239. J. Edmondson & T. Ingram. | 1251. J. H. Johnson. |
| 241. D. E. Hughes. | 1256. A. Parker. |
| 261. B. J. A. Bromwich. | 1418. G. W. E. Friederich. |
| 273. G. Blake. | |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[From Gazette, July 21st, 1863.]

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|---------------------------------|-------------------------|
| <i>July 13th.</i> | 1730. A. C. Bamlett. |
| 1701. S. C. Lister. | <i>July 17th.</i> |
| 1750. A. B. Woodcock. | 1779. G. H. Birkbeck. |
| 1816. A. Gélis. | <i>July 18th.</i> |
| <i>July 14th.</i> | 1754. J. Saxby. |
| 1731. E. Loysel. | 1764. C. C. J. Guffroy. |
| 1810. T. Fowler & De G. Fowler. | 1769. J. H. Young. |
| <i>July 15th.</i> | 1772. M. A. F. Mennons. |
| 1726. J. Fletcher. | |

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[From Gazette, July 21st, 1863.]

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| <i>July 14th.</i> | <i>July 16th.</i> |
| 1661. W. Watt. | 1670. H. Turner. |
| 1674. T. Duncan. | <i>July 18th.</i> |
| | 1725. J. E. Hodges. |

LIST OF DESIGNS OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietor's Name.	Address.
4570	July 3.	New Form for Packets of Paper.....	Frederick Barker	13, Dorcas-terrace, Hammersmith, W.
4571	" 18.	Fire Bars	Thomas T. Jopling	Dunning-street, Sunderland.
4572	" "	Rivet Hob Nails for Boots and Shoes	Henry Bell	Birmingham.
4573	" 20.	Combined Sketching Easel and Stool	Henry Gillett	Birmingham.