Correspondence.

The Propulsion of Electric Pendula.

To the Editor of the Scientific American:

On page 107 of the SCIENTIFIC AMERICAN, for February 13, a query is asked by C. A. Y. as to the number of cells of a "gravity" battery necessary to propel a ten pound pendulum, beating seconds. The reply to his question tells C. A. Y. that two or three such cells will be requisite.

Let me say to this querist, and all who are interested in electric time, that if they wish to get "time" out of a pendulum kept moving by electricity (or any motor), the force imparted to the pendulum must be a minimum—just enough to keep up the "swing," and no more; in other words, the pendulum must be left as absolutely free from all interference as possible, as can easily be seen to be necessary by looking at the mathematical theory of pendula.

The amount of power necessary to keep up the vibration is very much less than the answerer of C. A. Y.'s query evidently has any idea of, being (in the case of the great clock at the Houses of Parliament, at Westminster) only 1 ounce falling nine-tenths of an inch at each beat (or every 4 seconds), and is ample to drive a pendulum weighing 700 pounds, or, say, 200 foot pounds per diem! From these data, C. A. Y. will see how very minute is the force required to keep his 10 pound pendulum in motion. I should say, one gravity cell ought to be ample indeed.

N. B. SIZER, B.Sc., M.D.

Brooklyn, N. Y., February 12, 1886.

[The two or three gravity cells mentioned by us are good practice, and are what are in daily use in this city in the case of such a clock as described. Where continuous action and reliability is looked for, it is well to have battery force above the theoretical requirements. One great source of resistance to the motion of a pendulum is due to the air, and this is much greater in small than in large pendulums, in proportion to their weights. The ratio of air resistances in these two cases would not be far from one to sixteen, allowing for the pendulum rod, etc.—ED.]

Manufacture of Crystal Balls.

To the Editor of the Scientific American:

It has been generally conceded, by the few owners of the beautiful spheres of rock crystal (quartz) which are now considered the acme of a Japanese bric-a-brac cabinet, that they could only be manufactured in Japan; no other people having the patience and the requisite skill to fashion a mass of rock into such a perfect shape.

This opinion prevailing among collectors of *chef d'œuvres* has been the sole reason for the astonishing prices which crystal balls have occasionally brought. Only lately, at the sale of Mrs. Morgan's collection of Oriental curios, a perfect sphere of transparent colorless quartz, four and one-half inches in diameter, brought the sum of seventeen hundred and twenty-five dollars. The writer also remembers the sale of a ball of about the same size, in 1877, for two thousand dollars. An extraordinary one, in point of size, being nearly seven inches in diameter and quite perfect, is held by its owner at a valuation of five thousand dollars. Now, such prices and valuations are founded only upon the mistaken idea of the rare skill and great patience thought to be *necessary* to shape such objects to such perfect results.

A halo of mystery surrounds these objects of Oriental workmanship, too, and helps to give absurd ideas of value to them.

The word "Oriental" is also pushed to extreme uses by the dealers in Japanese bric-a-brac, as, for instance, a dealer possessing a crystal ball will confidently assure you that rock crystal from the Orient (India, China, or Japan) is very much *harder* than the same material from other regions; which assertion has no foundation in fact.

The hardness of quartz *is an essential constant* of the mineral, as are also the elements of its crystalline form. Wherever found, quartz crystals are identified by their uniform hardness, density, and shape.

Appreciating the several facts above mentioned, the writer saw no reason why America could not produce these crystal spheres equally as beautiful as the famous Japanese productions; and with this end in view, he first sought the *material* suitable for the purpose, being confident that the labor of shaping and polishing was but a secondary matter, a mere mechanical operation.

As early as 1878 my attention was directed to the Southern States, as a probable region wherein to procure clear crystal masses for art purposes. It was in 1879 that I had my first success in discovering a locality of really fine and perfect material. This was in Sharpe's township, Alexander Co., N. C. Since then, I have found occasionally very creditable masses in other parts of North Carolina, and also in Virginia, South Carolina, and Georgia, though in none of these places in any great abundance. California and Arkansas have furnished great quantities of clear rock crystal; but perfect pieces of large sizes were very exceptional. Opportunity for trying the experiment did not occur until the summer of 1884. I then enlisted the services of a skilled lapidary, putting into his hands a piece of clear material from North Carolina, suitable for cutting a small sphere, and urging him to lose no time in completing the work. I was somewhat surprised and pleased to receive from the lapidary the finished ball *within a week* from the time the rough mass was put into his hands, the ball being perfect in every particular of roundness, polish, and pellucidity. It measured two inches in diameter, and possessed every perfection and attractionbelonging to a Japanese crystal ball.

This perfect sphere of quartz, the largest ever cut in America at the time, was exhibited at the North Carolina State Exposition of 1884 and at the New Orleans Industrial Exposition of 1884–85, at which places it received many encomiums from the press, as evidencing the resources of our country and the skill of American labor.

This article is particularly called forth by the completion, on April 3 of this year, after ten days' labor, of a superb crystal sphere measuring three and one-sixteenth inches in diameter, and weighing exactly one and one-half pounds. As a piece of American workmanship in crystal it stands alone, at this time; and in its various perfections is unexcelled, excepting in size, by any similar Japanese effort that has come under the writer's notice.

Therefore, possessing the requisite material, we can henceforth make crystal spheres, lenses, or even "bottles of stone," *here within the United States*, if the *dilettanti* should require them, or fashion demand such articles of luxury. WM. EARL HIDDEN.

Newark, N. J., April 5, 1886.

Early History of the Power Loom.

Some notes on this subject have lately been contributed to a Scotch provincial paper by a retired power loom tenter, who was engaged in working among looms in the Glasgow district for the long period of forty-eight years. When and where power looms first came into existence is, he says, a matter which is not much known at home, and far less abroad; and the statements which he makes he knows to be facts in connection with the matter in question. The following is a condensed chapter of his early history of the power loom:

In the year 1793, a man named Andrew Kinloch, a mechanic, with the assistance of an old clockmaker, made in his little workshop, in a close in the Gallow Gate of Glasgow, the first two power looms that were ever made in the world. The cash for carrying on the experiment was supplied by two enterprising members of the Glasgow Chamber of Commerce. The motion was imparted to the looms through a common crank, just the same as that of a mangle; and after fifty yards of good cloth had been wrought, the experiment was pronounced to be a complete success.

Kinloch at once got an order to make forty looms on the same principle; and in a short time the forty-two looms were set a-going at Milton, near Dumbarton, by water power. The management of the little factory was placed in the hands of Kinloch, who taught two young lads the art of tenting the looms. One of them was Walter M'Cutcheon, who in later times was for many years manager of the Wellington Factory, Hutchestown, Glasgow, and the other was Archibald Barclay, who held a similar position at Catrine Works, Ayrshire. These two men were the first who ever handled a screw key as power loom tenters in this or any other country. The walls of the little old factory at Milton are standing at the present day, but completely enveloped in a mantle of ivy.

Our historian lately accepted from Mr. Muter, the present proprietor of Milton, an invitation to visit and inspect the ruins of this first power loom factory, which greatly interested him. The old wheelhouse lade, which contained a wheel 33 feet in diameter to provide driving power for driving the looms, is still in existence. Mr. Muter told him that his uncle, the late Patrick Mitchell, who was the previous proprietor of Milton, preserved two of the original looms, which were kept as relics, and that he had intended sending them to the Great Exhibition of all Nations held in London in 1851, but unfortunately the storeroom in which they were kept was destroyed by fire one night, and the looms were burnt to ashes.

After the little factory had wrought for twenty years, but before machines for dressing weavers' webs had been invented, it was found that the looms were not profitable, and they were put out in the year 1813. A Paisley firm purchased the forty looms and set them a-going in the old Abbey Close Mill, where they were worked by steam power for many years. Shortly after the looms were put out of the little factory at Milton and removed to Paisley, yarn-dressing machines were brought into successful use in Glasgow, and by this means power loom weaving was made a very profitable line of business, which was evidenced by the fact that in a very few years many thousands of power looms were started in Scotland and England.

In the year 1842 our historian was working in the Wellington Factory, Glasgow, where Walter M'Cutcheon was the manager, and at that time old Kinloch, whose hair had become as white as the driven snow, paid a visit to Glasgow. As soon as it was known who he was, the managers, tenters, and yarn dressers in the numerous power loom factories that had by this time been established in Glasgow and suburbs rallied around him, and after proper arrangements had been made for the occasion, the veteran inventor was entertained to supper by them, and presented with a purse of sixty sovereigns, in consideration of his being the inventor of the power loom. As our historian was one of the subscribers to Kinloch's token of respect, he was present at the festive meeting and heard the venerable inventor relate the history of his early power looms. Kinloch informed his audience that he had met with no opposition in Glasgow, but when he visited England he had a very different reception. After he had got a hundred looms started in a little mill at Staleybridge, a great mob, which consisted chiefly of hand loom weavers, who very naturally considered that the introduction of the new kind of looms would ruin their trade, attacked the factory one dark night and had it burned to the ground. But it was rebuilt on a larger scale in a very short time. Kinloch subsequently went to Manchester, and had great numbers of his looms set a-going there; and in a short time weaving factories started up in many towns and villages in England. The old man went on to say that after he had been informed by a few trusted friends that the hand loom weavers were really bent on taking away his life at the first opportunity, he at once left England for America, where he was well received by all classes, and met with no opposition of any kind in getting his looms started in several parts of the United States. In a few years afterward numbers of power loom factories were started in various parts of the Continent, especially in France, Germany, Belgium, and Switzerland.

The Cheap Dinner Movement.

The movement for supplying wholesome food and dinners to the people at a cheap rate has received a further development from an able and interesting paper lately read by Captain Wolff at the Parkes Museum of Hygiene. The audience, consisting of the Fellows and Members of the Sanitary Institute, and presided over by Dr. Richardson, listened with great interest to the essay, and carried out afterward a very useful discussion. Captain Wolff, who has personally traversed the greater part of the metropolis in order to determine where the wants of the people are most pressing, displayed the results on what may be called a food map of the metropolis. In some of the quarters thus delineated it may truly be said that there is not only deficiency of provisions at a moderate cost, but that the means for the preparation of food of any kind in a wholesome form are completely absent. There are neither kitchens, nor fires, nor cooks. In the wildest parts of the world it would be possible to find better provision than here in the midst of civilization; and how can it be expected that men under such conditions should live a law-abiding, civilized existence? If a man drinks beer, he thinks beer, said Samuel Johnson; and equally true is it that, if a man is forced to feed as wolves feed, he will grow wolfish and out of the ordinary rules of human government, however wisely those rules may have been framed for the common good. The design now suggested proposes to meet the dangers and the difficulties incident and consequent on starved revolt by sensible prevention of danger. It asks for no charity, which, as the chairman insisted, cannot be a permanent aid; but it opens to all thoughtful persons a mode of applying their time and their money in a way that shall yield a return for both, and confer a national service, which it were well to render while times are still peaceful and the masses loyal. The subject is not technically one which concerns the profession of medicine more than other professions or callings, yet we are glad to see that medicine is taking the lead in the practical working of it. If Dr. Richardson and those who are striving with him can but succeed in establishing half a dozen kitchens on a model scale, the success will, we seriously believe, be quickly assured. The movement would rapidly grow, and in a few months the metropolis, in every part of it, would have comfortable dining quarters at which the poorest would be fed wholesomely, rationally, and comfortably. A public kitchen and dining room in rivalry to every public house would be the grandest counterblast to public intemperance that was ever set up.—*London Lancet.*

Disinfection of Rooms.

The author recommends mercuric chloride. The windows, chimney, etc., are carefully closed up, and 50 grms. mercuric chloride are placed in any suitable vessel, which is then set on a pan of burning charcoal, the operator immediately leaving the room and closing the door. After about four hours he re-enters, with a cloth over his mouth and nose, and throws open the windows. After some hours of ventilation a slight stoving with sulphur is made to follow, which neutralizes any remnants of mercury. This process not merely disinfects, but destroys all kinds of vermin.—*M. Koenig.*

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