Correspondence.

Lucilia Macellaria.

To the Editor of the Scientific American:

The article by Dr. Fred. Humbert in your issue of Nov. 10 has just met my eye. Dr. Humbert speaks of several inaccuracies that are important enough to need correction in his letter published in the *Bulletin* of the United States National Museum, which may be true enough; but in attaching any blame to the undersigned for whatever inaccuracies there may be in his letter, he is himself both inaccurate and unjust.

The truth of the matter is that the doctor's letter was so illegible, and his English so poor, that some alterations were needed to make sense of it; but those alterations were made for the most part before the letter was transmitted to me by Prof. Baird. A re-examination of the original letter shows that none of the changes which Dr. Humbert indicates were made, but that on the points which he draws attention to, his letter corresponds with the published copy. In reference to the specific name of the fly, I wish to assure Dr. Humbert that I did not depend on his description for the determination, but upon the specimens themselves, which, fortunately, he transmitted with the communication. There are characters which enable the entomologist to make such a determination whether the flies are dead or alive, and therefore his conclusion that the fly cannot be properly named is totally unwarranted.

C. V. RILEY.

Washington, D. C., December 4, 1883.

"How to Cook an Old Hen."

To the Editor of the Scientific American:

In your issue of November 24 Professor Williams gives his method of cooking an old hen, which reminds me of a little of my own experience with that familiar bird. Having the hen fever bad, I was glad to get in proper season every sitting hen I could. At one time I got a fearful measly looking specimen, but as she was willing to sit on anything, even brick-bats, she served my purpose well. During the process of incubation she sat very close and almost entirely abstained from food. When the three weeks were up there was hardly enough of body left to generate heat sufficient to finish incubation. But when she came out with her chicks she never declined her rations, and became very fat when the chickens were ready to wean; and as she was good for nothing else I took her head off, and not being the proprietor of a "boarding house," she was cooked for my own table, and to my surprise she was the most delicious fowl I ever tasted. And it seems to me this is a proper question to place before any scientific American—Whether she was an old hen or not? And whether a fowl can be old that makes all its growth, except the frame, in a few weeks?

Let that be as it may, the discovery made by me proved fatal to old hens afterward. The proper method is to feed well while they are with the chickens, and kill them as soon as the chickens are ready to wean.

JOS. M. WADE.

Boston, December 3, 1883.

The Use of Cinder as Ballast.

R. M. P. says: We are using on our road a considerable amount of cinder and coal slack for ballast; the question has come up as to whether this ballast is destructive to ties or not.

[ANS.—Engineers who have used cinders as ballast state that they have noticed no injurious effect upon the ties. In a well drained track ties laid in cinder are no more likely to rot than when laid in some other materials. The dust from fine cinders makes the latter objectionable. When the coal has not been completely burned, there is danger from fire.]

The Reis Transmitter.

The world has an interest in knowing what relation Philipp Reis, of Germany, has to the speaking telephone of to-day; what he did is of great importance to us, says a writer, signing himself W. X.; in the New York *Electrician*, because if he invented an electric speaking telephone twenty years ago, and made the invention known not only by descriptions of the device, but by making and selling his telephones in public market, it is clear that the credit for the invention belongs by right to him, and it is also plain that so much as he invented belongs now to the world, and ought not to be the exclusive property of any man or company of men.

On this question, as to what Reis did, there has been a vast deal of talk in courts, and a great deal of craftiness by lawyers has been displayed, and the language has been so carefully shaped for the requirements, that if the language were like a machine it would no longer be fitted for ethical purposes. Let us see, then, what it was that Reis *did*.

First. *He invented a certain device, which he called the telephone.* It consisted of two parts, a transmitter and a receiver. Some of his constructions are in existence to-day just as he used them and left them. Let us examine the structure of his transmitters. He made eight or ten varieties, but they all involved the same idea. For the purpose, we will take the bored block form, such as he exhibited to the Physical Society at Frankfort on the Main, 1861.

Now here is a device, a collocation of mechanical details invented and constructed for a specific purpose; namely, the variation of an electric current by means of sound vibrations, chiefly those of the voice, as the tube plainly shows. Is it adapted to its purpose, and will it do the work for which it was designed? This is a question which may be answered in two ways, theoretically and experimentally. If the above instrument, or a facsimile of it, be connected properly with a magneto receiver, its capabilities may be experimentally tested, and when thus tested it is found to be a good speech transmitter, extremely sensitive as a microphone, and words spoken ten feet from it may be plainly heard at the receiver. If that be true, it follows that the Reis transmitter, just as he left it, is capable through its appropriate action of giving to the electric current its proper variations for the reproduction of speech; in other words, it yields the genuine undulatory current. What is true of this transmitter is true of the more common form of Reis transmitter, namely, the cubical box with the membrane on the top. Especially good will the results be, if the transmitter be coupled in the primary circuit of a small induction coil, while the receiver is in the secondary circuit.

Reis invented these transmitters for this purpose, and he used them for the same purposes, and he said he heard words at the receiver which were spoken at his transmitter, and what he said was corroborated by quite a number of his contemporaries, several of whom are now living; but as an offset to the above it has been affirmed, and the courts have so ruled, that Reis *intended* that his transmitter should work in such a way as to make it impossible that speech could be transmitted by it; namely, he *intended* that the electric circuit should be broken for every vibration, and the evidence for it is his description of the working of his device. This declaration is equivalent to the assertion that what Reis invented was, not certain instruments for a certain purpose, but *a theory of the working of certain pieces of apparatus;* and consequently, if Reis did not describe the working of his devices correctly, he did not invent the devices, and consequently the world has no right to his apparatus.

Again, let us inquire what it was that Reis invented. Suppose that in place of the platinum terminals he had used iron, or copper, or carbon, or anything else, would it have changed the character of the device? Not at all. One might have answered better than another for the purpose, but all would act in substantially the same way, the differences would be altogether those of degree and nothing else. Let a piece of electric arc light carbon be substituted for the platinum in either of the forms of Reis' transmitters, and at once it becomes equal to the very best of modern transmitters. Why? Because the *intention* has been changed? No. Because the mechanical arrangements have been modified? No. Indeed, it is only because of the demand for a superior article of carbon for electric lighting that such carbon for transmitters has been adopted, as any one may verify for himself by trying any ten year old carbon stick in his transmitter. Has the one who substitutes the carbon for the platinum invented the *undulatory current?* It is preposterous. At best he has made the transmitter more useful; but, even in that place, the function of the carbon is simply to vary resistance, and it had been put to that service years before.

Second. *Reis described his apparatus and gave his theory of its action.* This is the part that is seized upon by the assailants of the claims of Reis as being the inventor of the speaking telephone. Suppose, for argument sake, it be admitted that Reis expected to reproduce speech by means of an intermittent current, and that he *intended* that his transmitter should make and break circuit for every vibration. It must be admitted that any automatically working device can only work in accordance with the mechanical conditions present in the device, and no will, or intention, or theory concerning it will make any difference in its working, so long as it is not otherwise *compelled* to work differently, in which case it would not be automatic. What then does it matter how Reis thought his machine acted? His *theory* of its working might have been wholly wrong, yet its performance be wholly right. When *we* speak to a Reis transmitter we find it gives the proper undulatory current for the transmission of speech. *It must have done so for Reis*, unless physical laws have changed since his time, and it is not likely that any one will have the hardihood to affirm that; and it is only by trifling with the facts, and by ingeniously framing sentences, that conclusions hostile to Reis' claims have been drawn. How then does the case stand? Reis did two things. He invented a telephone transmitter for the purpose of the electric transmission of speech sounds and any other. He succeeded in doing it, and we can to-day with the same instruments. He also *described* his devices, giving a theory of their action, which in some particulars is inexact. These two things he *did*. The courts have decided that, because he did not *describe* the action of his device as we would describe it to-day, when used for the same purpose it was invented for, the Bell Company is, therefore, entitled to a monopoly of what he *invented* for the purposes for which he invented it.

Copper and Microbia.

It is stated that the antiseptic action of copper sulphate is slightly superior to that of salicylic and benzoic acids; twice greater than that of phenol; five times greater than that of alum, tannin, and arsenious acid; and ten times greater than that of chloral hydrate and the ferrous salts. Copper chloride is from one-third to one-half more efficient than the sulphate.

Affairs at the Patent Office.

WASHINGTON, December 2, 1883.

The new change of time to accommodate the railroads, for that is really all this change was made for, and the consequent bringing to public notice the fact that some railroads had adopted the twenty-four hour system of reckoning time, seems to have had an influence upon inventive genius, for applications are pouring into the Patent Office for devices for clocks and watches with dials upon which the extended hours are noted. Many of these are quite ingenious, but the majority are not actually new, but are simply modifications of a system which was in vogue some four hundred years ago. An inspection of some French publications of the fifteenth century discloses the fact that the manner of duplicating and marking the time from 1 to 24, representing the twenty-four hours of the day, was practiced at that date. A notable instance was shown me in a work of that period containing a plate of a watch with the hours from 1 to 12 in Roman characters upon the outer rim of the dial, while upon an inner circle were the hours from 13 to 24 in Arabic figures. This dial belonged to a watch in Prince Pierre Soltykoff's collection, and was of gold and enamel of most elaborate workmanship, the sides being of rock crystal, through which the works could be seen. The age of the watch is not absolutely ascertained, but from certain characteristics of the movement it is believed to date from the beginning of the reign of Henry II. of France (A.D. 1547).

The Examiner of Interferences has the past week made decisions in several cases which have been for a long time in litigation before the office, and the results of which have been anticipated with considerable interest. In the case of Jablochkoff *vs.* Brush, secondary battery as applied to electric light, Brush showed by evidence that the device which Jablochkoff claimed as his invention, and in which the interference was brought, had been in public use for over two years, and the examiner dissolved the interference. This is one of the first cases under the recent decision of the Supreme Court of the District, as to the taking of testimony to establish the public use of a patent.

In the case of Crompton, Fitzgerald, Biggs, and Beaumont *vs.* Brush, also secondary battery, a decision has been given in favor of Brush. The plaintiffs relied on a foreign patent, but that patent was ruled out.

In the cases of Kieth, Shaw, and Brush *vs.* Faure, and Kieth, Shaw, Maloney, Brush *vs.* Faure, an application to extend the time for taking testimony has been refused. These cases have now been hanging for over a year, and a near settlement seems probable.

Two interesting telephone cases are now under consideration by the Examiner of Interferences, and will probably be shortly decided. These are Eldred *vs.* Shaw and Forium *vs.* Shaw. The point involved is the telephone as applied to the exchange system.

Another examiner has resigned to go into practice against the Office. As has been frequently said, the rates of compensation for the skilled labor acquired only by experience in the Patent Office are so disproportionate to the importance of the services, that it seems that young men of brains and ambition simply use their positions in the Office to acquire a complete familiarity with the rulings and practice, and then resign to utilize that knowledge for their own benefit and that of their clients. While the ranks of patent attorneys are thus recruited the business of the government is really crippled, for new men are constantly being educated only to go out as their predecessors when they shall have become sufficiently well informed to show the Office its weakness, and to win for their clients that which ought to come without the aid of an attorney.

FRANKLIN.

Dentists should sharpen their own Burs.

Dr. G. Newkirk, in the *Dental Cosmos*, recommends dentists who can spare the time to sharpen their own burs. He says that burs may easily be sharpened several times without recutting, if one has the disposition to acquire the art. First, get a knife-edge Arkansas stone. (I had the ill or good fortune to break mine in two, and I keep one piece for this special work.) To *keep* the knife-edge, renew it when dull by holding it lightly on a small, fine corundum wheel, either lathe or engine. Of course this grinding must be done carefully, to avoid chipping the edge. A whetstone may be used to finish the edge if you wish. Take a pine stick, punch a hole in the end with an awl or other small instrument; then whittle down to a nice round handle to hold your bur. Now, holding the handle between the thumb and three fingers of the left hand, let the instrument itself rest on the index finger. With a little practice the right hand may be taught to hold the stone lightly and draw it evenly through the slots and bearing on each chisel edge. As each becomes sharp, a very slight rotation of the handle from left to right brings the next chisel into position, and those sharpened are so passed along and no danger of being dulled, as there might be if the bur were rotated backward. Clean the edge occasionally and have a bit of oiled flannel with which to keep it lubricated. The beginner will probably spoil the edge of his stone once or oftener, but if he perseveres he will soon be gratified by the consciousness of having mastered a nice little art.

LOUISIANA has 2,557 factories, working 30,071 hands, with a capital invested of $18,313,974, paying annually in wages, $4,593,470, and yielding annually in products $24,161,905.

Old Ammunition.

The huge pyramids of spherical shot and shells deposited in various parts of the Royal Arsenal, Woolwich, are condemned to the melting furnaces for conversion into projectiles more adapted to modern requirements. One heap alone contains about 40,000 of the 13-inch shells which were supplied at the time of the Crimean war, and were the most formidable missiles used in the siege of Sebastopol. The 13 inch mortars, from which they were fired, have long ago disappeared out of use, but lie in hundreds in a distant part of the arsenal waiting orders for their demolition, and no round shot or shell of any size have been made since the introduction of rifled ordnance and elongated projectiles. They are being all gradually broken up. Another ancient description of shell of the class known as smoke balls and ground light balls has been declared obsolete, and all that are remaining in store will be destroyed. They are of various sizes, varying from 4½ inches to 13 inches in diameter.

Covering Iron and Steel with Copper.

According to the *Metallarbeiter*, iron can be coppered by dipping it into melted copper, the surface of which is protected by a melted layer of cryolite and phosphoric acid. The articles to be coppered must be heated to the same temperature as the melted copper.

Another process consists in dipping the articles into a melted mixture of one part of chloride or fluoride of copper, and five or six parts of cryolite, and a little chloride of barium. If the article when immersed is connected with the negative pole of a battery, it hastens the process.

A third method consists in dipping the article in a solution of oxalate of copper and bicarbonate of soda, dissolved in ten or fifteen parts of water, acidified with some organic acid.

A MASSIVE SCAFFOLDING.

The Manhattan Company's Bank and the Merchants' National Bank are now erecting a building at Nos. 40 and 42 Wall Street, this city, after designs by W. Wheeler Smith. The building extends through to Pine Street. It will have a front of plain and polished granites from the Hallowell, Fox Island, and Westerly quarries: the floors will be iron beams resting upon iron columns.

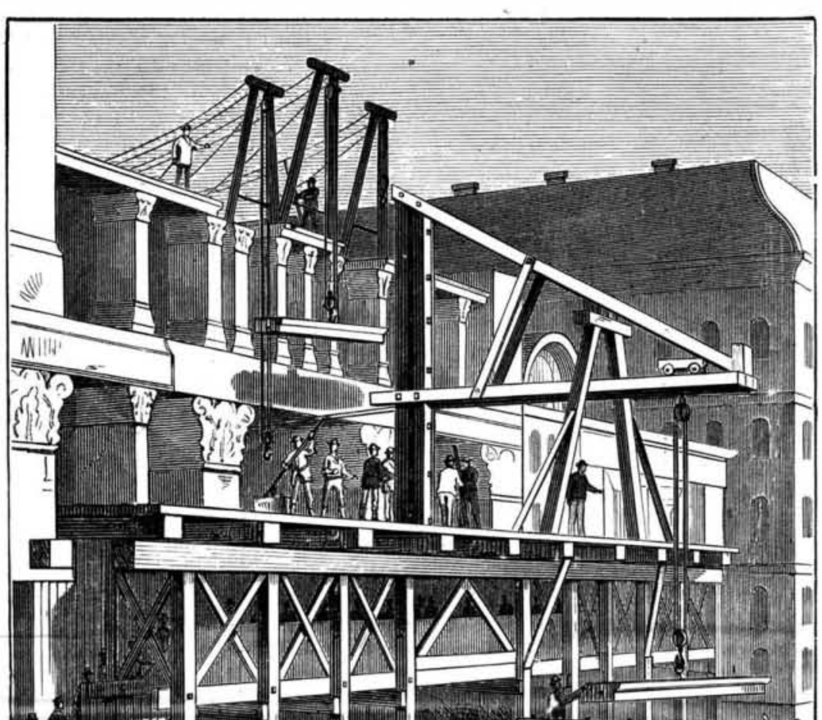
In order not to interfere with street traffic and at the same time to expedite the handling of heavy pieces, and be free from the annoyance caused by curious sightseers, a scaffolding of massive strength was erected, shown in the accompanying engraving. The posts composing this framework are 12 by 12 inch pine timbers held together by lateral braces, and between each panel are wooden diagonals. The outer line of posts is set alongside the curbstone. Transversely on top are placed floor beams, 12 by 14 inches, and 6 feet between centers, which project a short distance beyond the curb line, and on these, parallel with the street line, is a flooring of planks 3 inches thick, above which is a second system of planks the same thickness, but laid obliquely.

Raised above the sidewalk is a passageway extending the whole length of the staging. This has a width of 4 feet 6 inches, and is reached by a flight of steps at each end. By this means the foot travel of the street is not interfered with.

The center of the scaffolding is wide and high enough to admit a wagon, which is driven in and unloaded upon the first floor of the building.

The rear post of the main derrick rests just outside the front wall, and consists of two timbers 10 by 12 inches, bolted at intervals to each other and to the main posts. These are placed in a line perpendicular to the street. About 12 feet above the floor is the horizontal arm of the derrick, consisting of two timbers 10 inches square, and placed a few inches apart. The diagonal from the top of the rear post extends over an A frame, and is joined to the end of the horizontal arm. Upon the upper inner corners of the timbers forming this arm are angle irons, constituting the track upon which a little car travels. From the under side of the car hangs a block and tackle. The car is run to the outer end of the track, under which the wagon has been driven, and the hook is attached to the piece to be raised. The hoisting rope extends to the engine in the interior of the building. When the piece has been elevated above the floor, the car is run back and the piece is lowered on to a hand truck, or rollers, by the aid of which it is moved about on the floor. Distributed about parts of the building are derricks that raise the stone and leave it in its final resting place.

The various parts entering into the construction of the scaffolding are held together by nuts and bolts, plates being placed under the heads and nuts. It was designed so as to have sufficient strength to support upon the flooring all the material immediately to be used, thereby relieving the street of all unsightly heaps. Another consideration is that people are not subjected to danger from falling pieces while passing the building.

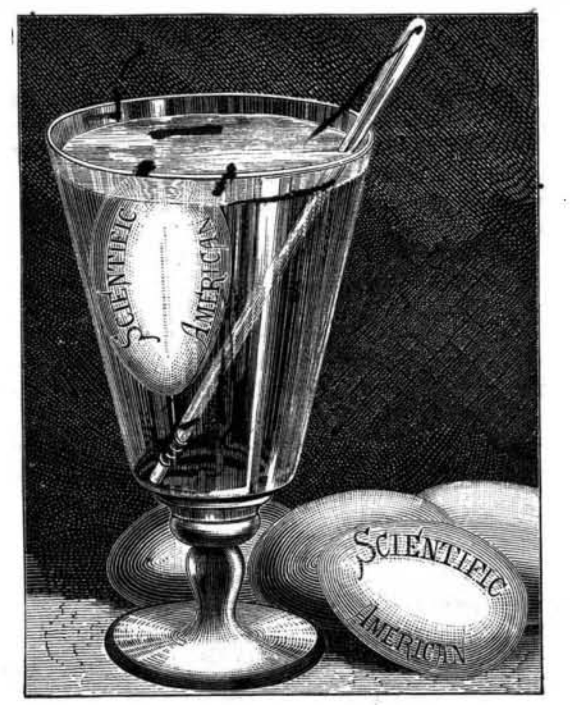


A MASSIVE SCAFFOLDING.

ENGRAVED EGGS.

Some time ago there was a man who stood upon the street corners and in the public squares selling egg shells upon which were engraved names, devices, or flowers. The art of engraving upon eggs is connected with a curious and little known historical fact.

In the month of August, 1808, at the time of the Spanish war, there was found in the patriarchal church of Lisbon an egg upon the shell of which was announced the approaching extermination of the French. This fact caused a lively fermentation in the minds of the superstitious Portuguese population, and came near causing an uprising.



ENGRAVED EGGS.

The French commander remedied the matter very ingeniously by distributing throughout the city thousands of eggs that bore engraved upon them a contradiction of the prediction The Portuguese, deeply astonished, did not know what to think of it, but thousands of eggs giving the lie to a prediction engraved upon one only, had the power of the majority. In addition, a few days afterward, posters put up on all the street corners pointed out the manner in which the miracle was performed. The mode of doing it is very simple.

It consists in writing upon the egg shell with wax or varnish or simply with tallow, and then immersing the egg in some weak acid, such, for example, as vinegar, dilute hydrochloric acid, or etching liquor. Everywhere where the varnish or wax has not protected the shell, the lime of the latter is decomposed and dissolved in the acid, and the writing or drawing remains in relief. Although the *modus operandi* presents no difficulty, a few precautions must be taken in order to be successful on a first experiment.

In the first place, as the eggs that are to be engraved are usually previously blown, so that they may be preserved without alteration, it is necessary before immersing them in the acid to plug up the apertures in the extremities with a bit of beeswax; and, moreover, as the eggs are very light, they must be held at the bottom of the vessel full of acid by means of a thread fixed to a weight or wound round the extremity of a glass rod.

If the acid is very dilute, the operation, though it takes a little longer, gives better results. Two or three minutes usually suffice to give characters that have sufficient relief.—*La Nature.*

Velocities.

An interesting table of velocities has been drawn up by Mr. James Jackson, the librarian of the Paris Geographical Society. He begins, says the *Photo. News*, with the velocity of a man walking two miles and a half an hour, and after alluding to the respective velocities of an ordinary wind, of a race horse, of an express train, of a carrier pigeon, of a hurricane, of sound in air and water, he brings us at last to the velocity of heavenly bodies, of electricity, and, finally, of light. But Mr. Jackson has left out one important velocity, which has only been recently computed, and which is of singular interest, since it represents the only earthly agent known to man with a velocity quicker than sound in water, although naturally less quick than electricity and light; we mean the detonation of the photographer's old friend, gun cotton. Abel and Noble have computed that a train of gun cotton, fired with a fulminate fuse, will transmit the detonating action at a speed of from 17,000 to 19,000 feet per second. In other words, detonation travels at the rate of 200 miles a minute, while next in order comes electricity traveling through a submarine wire at a speed of some 12,000,000 feet per second.

How Fire is Carried in Cotton.

Edward Atkinson, of Boston, says: "Fire lurks in a cotton bale for weeks. The cotton which was injured somewhat over a year ago in Biddeford, Me., was moved to South Boston for sale. The fire broke out again more than once while it was at South Boston being made ready for sale. It was then sold at auction. The fire broke out again in one parcel while it was on the cars being carried away, and in another parcel after it had been received at a factory where it was to be used. The latest outbreak was, I think, thirty days after the original fire."

Sorghum Sugar in Ohio.

A correspondent of the *Ohio Farmer*, conducting a sugar factory in that State, says:

"Not a single man that brought cane to our mill raised as much as one whole acre of it, generally from one-eighth to one-quarter of an acre, and they would have from one load to three or four good wagon loads of the cane; but over four-fifths of them simply wanted molasses for cooking purposes. And but a small portion of it were they willing should be cooked into sugar. Because we did not make more sugar was because we were not allowed to do so. Every gallon of good molasses made from matured cane, agreeable to the Stewart process, will granulate fully four pounds of sugar the first granulation. Estimates give 106 gallons per acre of sorghum molasses as the yield for Ohio. If this be true it would make fully four hundred pounds of dry sugar and seventy gallons of drainage molasses, worth from 35 to 45 cents per gallon at wholesale for cooking purposes. We have sold every particle of our drainage molasses at 35 cents per gallon, and if the sugar is left in we sell it from 69 to 75 cents per gallon. No man can get as much money from an acre of land in corn as he can from sugar cane, if he lives close by a sugar factory. The average worth per acre, if made into molasses alone, under the Stewart process, would be over sixty dollars per acre; and if made into both sugar and molasses it would come to fully seventy dollars per acre; besides this, the crop of cane seed if properly saved, cured, and thrashed, the same as wheat, is worth half as much for feeding purposes as the average acre of corn will yield in the same vicinity." And in any place and upon any circumstances whereby you are able to raise a reasonably good crop of corn, sugar cane will do equally well in the same field. It is more work to cultivate it, because you should plant more hills to the acre; but you can hoe a hill of one just as easy as you can the other, and the cutting is just the same. If you save the cane leaves for fodder it makes more work, but the fodder fully pays for that. The cane seed can be thrashed as easy and exactly the same as wheat, and will yield over fifteen bushels per acre on all cane that is good enough to make 106 gallons of molasses to the acre. The Rio Grande Sugar Company raised and worked up in 1882 about 800 acres of cane—not quite that amount as given into the State of New Jersey for the bounty money. They produced over 330,000 pounds of sugar and twice that number of pounds of drainage molasses. It is a well known fact in that vicinity that it was a very profitable business.