

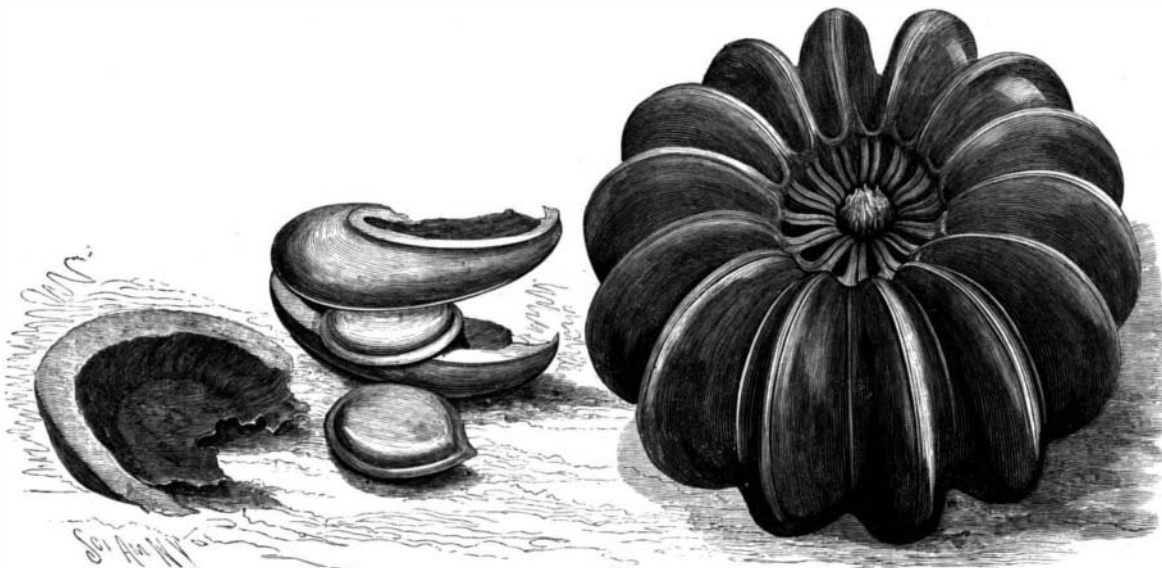
AN EXPLOSIVE NUT (HURA CREPITANS).

In the vegetable kingdom we find several varieties of fruit that are explosible by various natural processes, and they belong to several families. In the wise economy of nature the object of this bursting is to disseminate the seeds. Probably the most peculiar explosive fruit is that of the sand box tree (*Hura crepitans*) of the family of *Euphorbiaceæ*, which opens its fruit with a loud report, scattering the pieces in all directions. We present an engraving of this nut, an example of which was sent to the *SCIENTIFIC AMERICAN* to see if a remedy for the explosive feature could be devised, so that it could be used as an ornament. Of course nothing can be done to prevent this explosion, except, possibly, to plate it heavily with some metal, as copper.

The tree is found in tropical America, the particular example under consideration coming from the Amazon River valley. The tree grows to be from seventy to one hundred feet high. The bark is smooth and yields a milky sap when tapped. The twigs are sometimes spiny and the leaves are often six inches broad. The trees are often cultivated for ornament, from the West Indies to Brazil. If left to ripen on the tree, the nut explodes with a sharp report, when each of its curious compartments, numbering sometimes as many as sixteen, flies asunder, so that its seed, which somewhat resembles a pumpkin seed, drops out. Our engraving shows the condition of these ruptured cells. The nut has a dense woody fiber. The nuts stand exporting, and occasionally do not explode for several months. The pieces are thrown several feet when the explosion takes place. If the nut is kept in alcohol or water, it can be preserved for years. In the *SCIENTIFIC AMERICAN SUPPLEMENT*, No. 1051, an explosive fruit of the genus *Justicia* is described. When they are thrown into water they explode with a loud report, so that what tends to preserve *Hura crepitans* proves fatal to *Justicia*. In

THE PLANTIN-MORETUS MUSEUM.

There is a solidity and an old time burgher flavor about Antwerp which impresses the visitor, notwithstanding the fact that it is now one of the busiest ports on the Continent of Europe. Many of the fronts of the houses are commonplace, and none more so than the unassuming exterior of one of them in the Place du

**AN EXPLOSIVE NUT (HURA CREPITANS).**

Vendredi, but, once within the portal, all is changed, and we stand face to face with one of the most exquisite monuments which the revival of learning has left to us. We stand in the courtyard of the Plantin-Moretus Museum—a museum devoted to one art, that of printing. In the buildings grouped around this courtyard, printing was carried on not only as a trade, but as art, for a period of three hundred and twelve years by a whole dynasty of editor-printers, the Plantin-Moretus. Happy has been their lot to escape the fate which overtook those more celebrated printers, Gutenberg, Aldus, Elzevir, who have left nothing behind but their books. To-day the museum is a complete exposition of the methods of work carried on from the time when the printer had begun to be a power in the world until the new order of things came in with the advent of power printing.

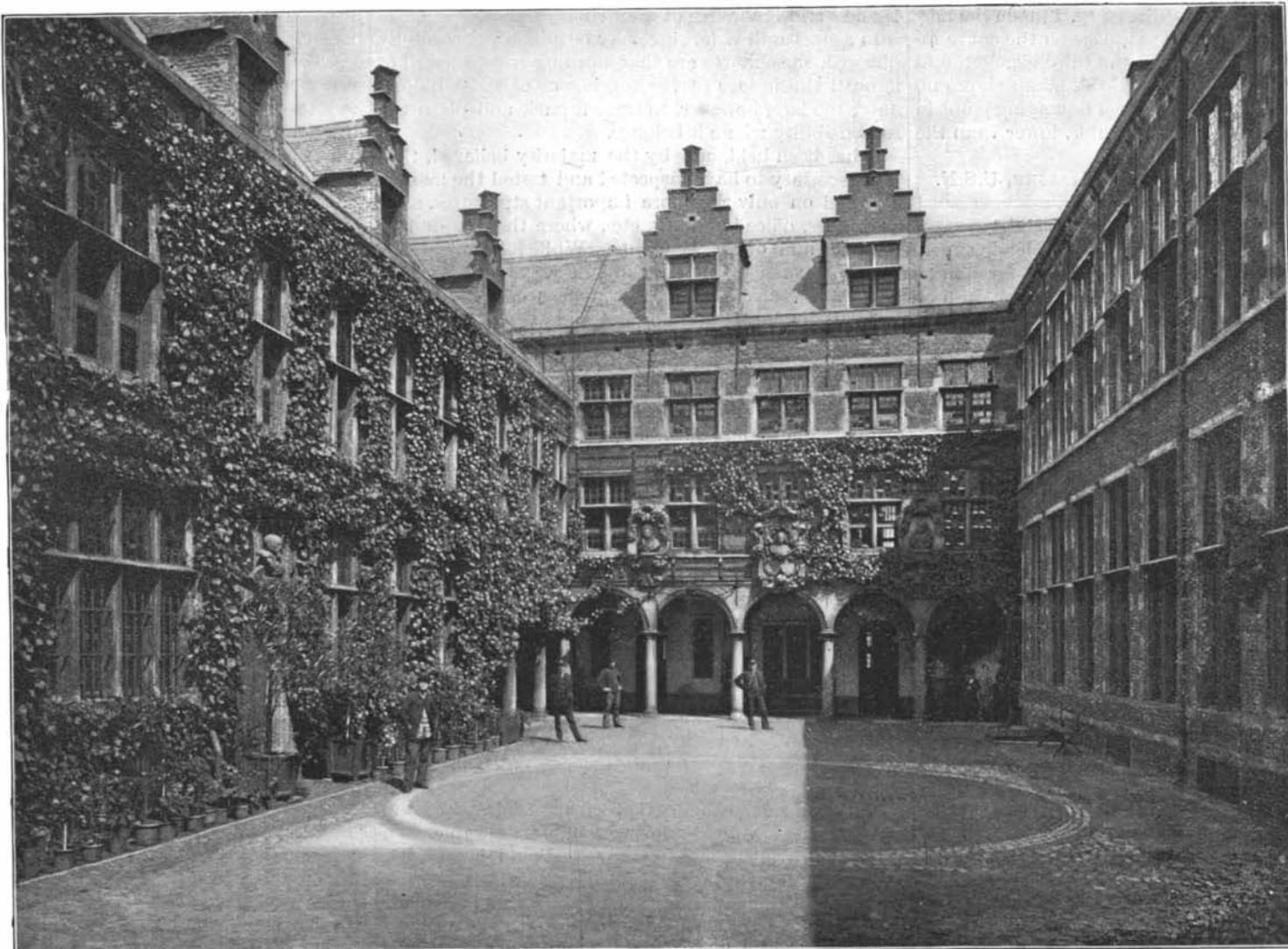
Before examining this printers' paradise in detail, let us pause for a moment to trace its history; and that of

many superb examples of his art. He was stabbed one night, so that he was incapacitated from carrying on his trade. In 1555 he printed, or possibly only published, his first book; the next year four more, and so on, until his ability as printer and publisher was fully recognized. All went well until he printed an alleged heretical prayer book. This caused him to retire to

Paris for a few months.

The matter was adjusted so that he was enabled to return, and with the help of borrowed capital he soon turned out an astonishing number of books. In four years he published over two hundred works, which would be considered phenomenal even in our modern publishing world. His business enlarged so he was obliged to take in a number of additional houses, so that, notwithstanding the fact that his successors altered and rebuilt some of the houses, the buildings remain very much as he left them. He obtained the royal patronage of Philip II, of Spain, and was assisted by that monarch to print the Royal

Polyglot Bible in four languages, a work in eight volumes. This was at that time the largest and most expensive work which had ever issued from the press. Plantin lost heavily on this book, but was recouped by being given a monopoly for the printing of mass books and prayer books for the Spanish dominions. He suffered many reverses, as when his establishment was sacked in 1576. He died in 1589, leaving a considerable fortune. All his family had been impressed into the service, and his son-in-law, John Moerentorf, whose name was Latinized into Moretus, succeeded him. The policy of the house was now somewhat altered, for while Plantin had set authors at work and really caused the works to be written, his successors adopted the more modern course of printing the works which were brought to them. The property was restricted by a curious clause in Plantin's will, that the property should be transmitted to the child who should show the greatest capacity for continuing the business

**COURTYARD OF THE PLANTIN-MORETUS MUSEUM, ANTWERP.**

either case the explosion may probably be referred to the tension on the hard fiber.

BEER is being bottled now in Germany in siphons that hold fifteen, twenty-five, and forty glasses. When drawn the beer is said to be as fresh as if drawn from the wood.

its founder, Christopher Plantin. He was born at Tours in 1514, studied in Paris, and finally went to Antwerp in 1550; here, for the next thirty-nine years, he struggled nobly with many reverses and laid the foundations of one of the most celebrated printing houses in the world. He first established himself as a worker in leather and as a bookbinder, producing

according to the ancient traditions of the house. For centuries the family prospered, owing to this provision and the monopoly which they enjoyed. In the last century the office lost prestige and became simply a manufactory of religious books, and at the beginning of this century the Spanish privilege was lost, and the printing office practically ceased to exist. At times only a

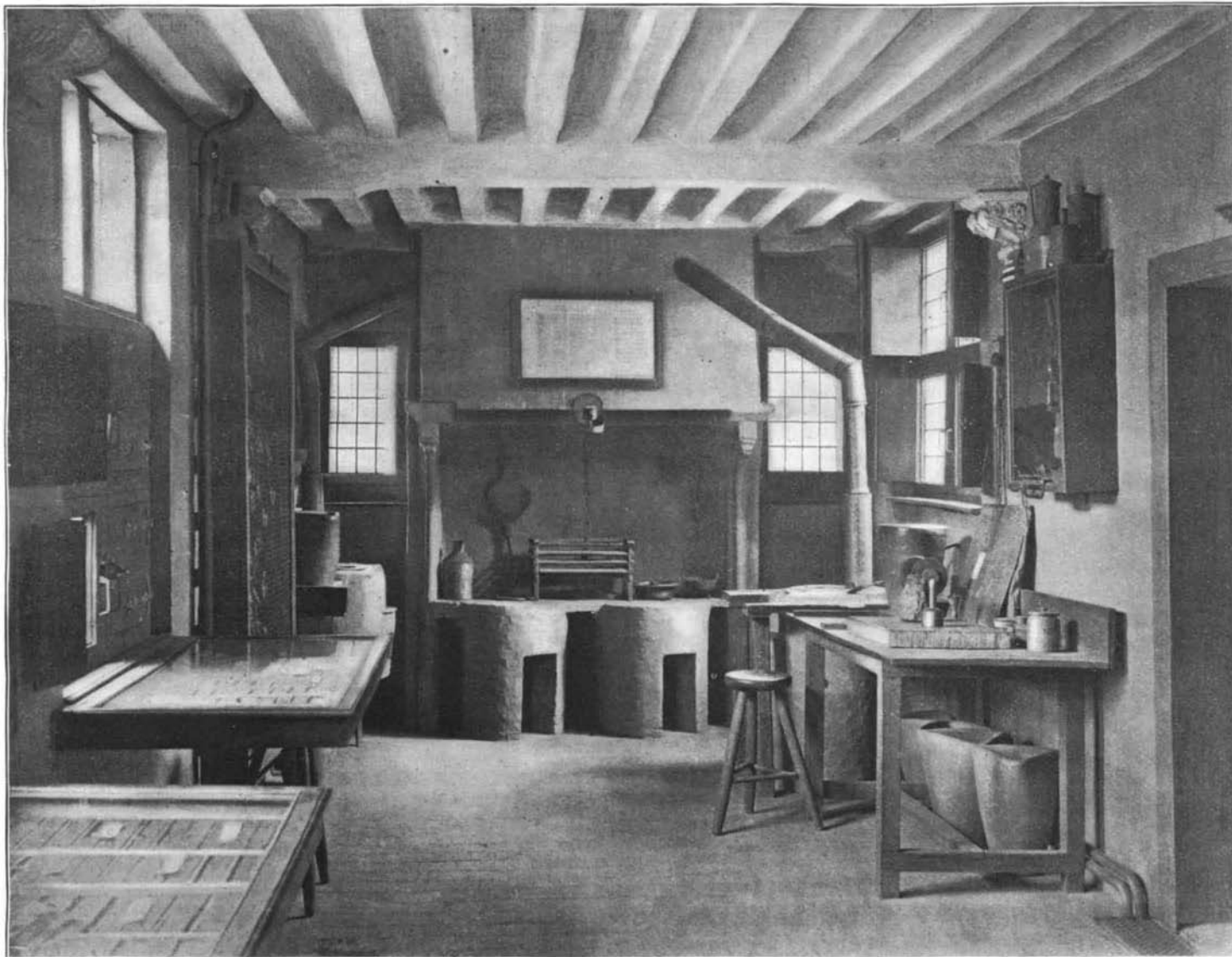
single workman was employed, and in 1867 the great range of buildings was closed. In 1876 the city of Antwerp bought this unique gem from Edward Moretus for 1,200,000 francs, and after careful restoration it was opened as a museum, and, having outlived its usefulness, it has descended to the "most worthy" of old Christopher Plantin.

The courtyard is about as pleasant and withal bookish a spot as could be imagined. Around its four

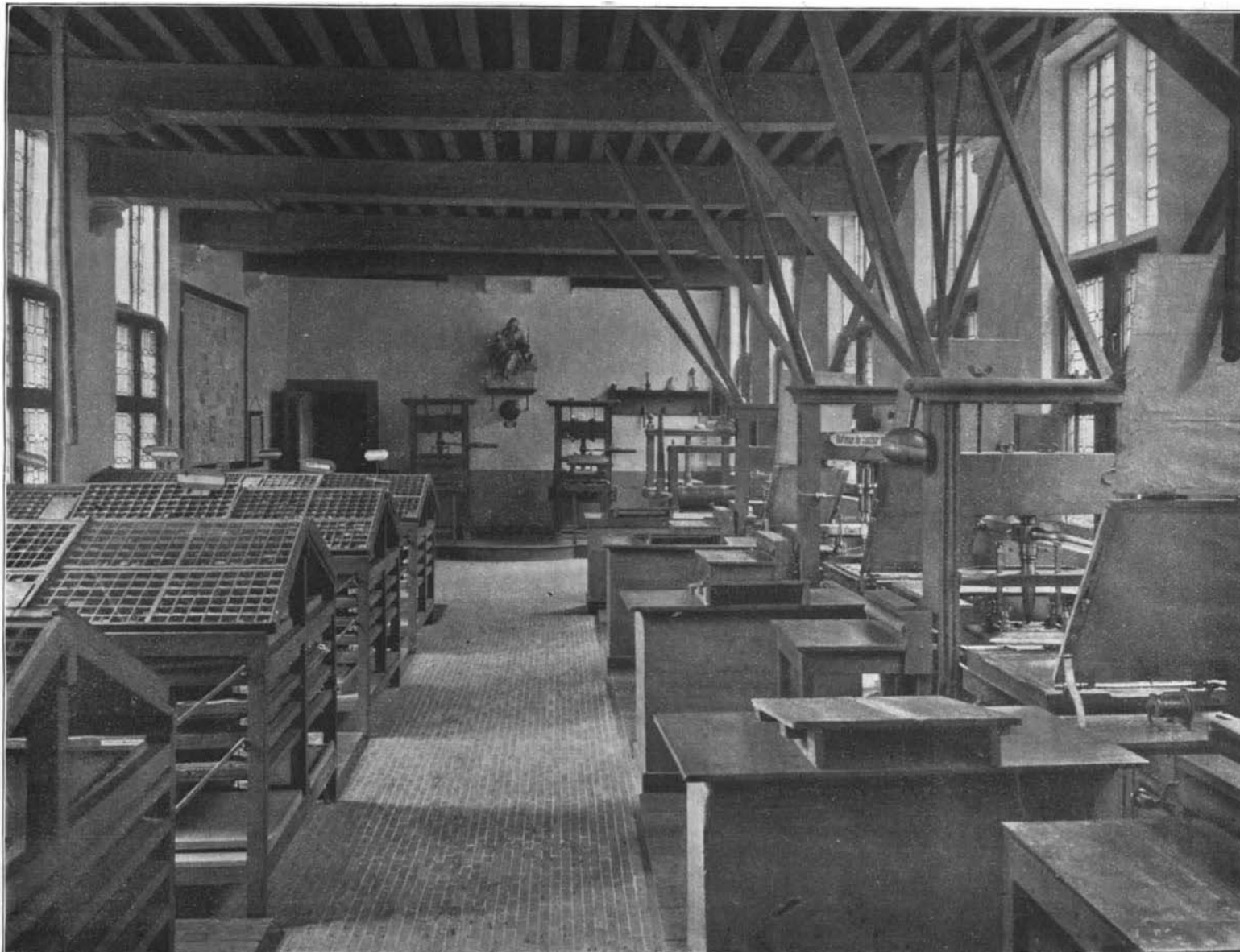
sides rise the printing offices and houses of the old burgher family, the façades of which are in many cases decorated with busts and with the pair of compasses which have been used for centuries as the trade mark of the family, while one side is entirely covered with the branches of an old vine. The curious old seventeenth century pump, the carved staircase and bench are all objects of interest. Directly behind the arcade shown in our engraving were the bookstores, fronting

on a side street, where the books were disposed of. Here to-day may be seen piles of old and dusty books which await the customer, while the scales stand ready to weigh the shining gold pieces, and upon the desk is a calendar of 1595. Plantin's daughters used to sell books in this little shop. To the left of the arcade were the rooms devoted to the correctors of the press.

Here, as in all the buildings, the restoration is carefully, almost lovingly done, not a single incongruous note



TYPE FOUNDRY OF THE PLANTIN-MORETUS MUSEUM.



PRESSROOM OF THE PLANTIN-MORETUS MUSEUM.

disturbs the whole; the pictures on the walls, everything, is in perfect keeping, and looks as though the eminent scholars who acted as proofreaders and editors had just left it, and in one case, indeed, if our memory serves us aright, a pair of spectacles lies on the half corrected proof sheets. The press room is certainly not as Plantin left it, for there are now only seven or eight presses, two of them being those used by Plantin. From these old ramshackle affairs came, however, the magnificent specimens of typography which are to-day eagerly sought by bibliophiles. Looking at almost any of the examples of the clear, even impression of the Plantin press, it will be seen that, indeed, the printer was superior to his method.

The flooring, made of narrow bricks, is much worn. On the walls are some sheets printed by the not over-muscular hand of royalty. Leopold I. of Austria, and Maria Louise, and others have struck off sheets. The pressroom is probably the oldest room in the whole range of buildings. In his earlier days Plantin caused his types to be cast for him, but finally he introduced a foundry of his own. Our engraving shows the casting room. Here, behind a wire screen, may be seen the mould and punches, while the furnaces and crucibles are ready for use. When we compare the printing done with the heavy full-faced type of these old printers with that produced by modern type, perhaps machine set, we must admit that, while something has been gained, much has been lost. Still, to-day, thanks largely to the late William Morris, who by the productions of his Kelmscott Press has educated people, there is now a demand for type which combines all the advantages of the new and the old.

The rooms all over the house are filled with old furniture, tapestries, carvings, books, paintings and engravings. Some of the rooms are very richly decorated, as Plantin's private office and the room assigned to the celebrated scholar Justus Lipsius. Of course the museum is not as Plantin left it. His successors were opulent and were men of taste. So it is little wonder that in time the collection became very valuable, even possessing several examples from the brush of Rubens, who also did designing for the establishment. After it was purchased by the city the collection was most admirably arranged. While it is true that the thirty-odd apartments may be visited in a morning, still it is the kind of a collection which grows on one, and repeated visits may be made without exhausting its interest.

Intensification with Bromo-iodide of Copper.

The gelatine negative must first be thoroughly freed from hypo, otherwise it is impossible to intensify it satisfactorily. The bromo-iodide solution is prepared as follows:

Sulphate of copper.....	12 parts.
Water.....	160 "

When dissolved, and in a thin stream, with constant stirring, the following mixture:

Iodide of potassium.....	1 part.
Bromide of potassium.....	2½ "
Water.....	60 "

A slight precipitate will form: this must be allowed to settle, the clear liquid only being used.

The negative (if previously dry) must be well soaked in water to soften the film, and then be immersed in the above solution in daylight, when it will bleach to a yellow color. After washing it can be blackened with an old hydroquinone developer.

The following formula will give a red color:

Hydroquinone.....	180 parts.
Cryst. sulphite of soda.....	90 "
Carbonate of soda.....	24 "
Bromide of potassium.....	1 "
Water.....	750 "

Various tones of sepia, dark brown, and iron black tones can be obtained by varying the proportions of hydroquinone and sulphite of soda. The development should be done in bright daylight, or even sunlight, in order to secure the best effects. The method will be found useful for modifying the tone of lantern slides.—The Amateur Photographer.

Questionable Application of Science.

In a technical contemporary we find the following passage, which, whether its assertions are true or false, claims the attention of analysts: "Scientific training seems very often to be diverted into curious channels. A large calico printer recently informed us that the chemical knowledge of the German drug and dyestuff manufacturers seemed to be devoted entirely to the art of defeating tests rather than to the manufacture of drugs to pass genuine muster. It was the Germans who introduced that dangerous adulterant in Portland cement—gypsum, to wit—entirely with a view of circumventing the American tests for cement. It matters not to the Germans that their cement is rendered dangerous, and that better results can be attained by safe means at very trifling cost. They have found an adulterant to serve a merely temporary purpose, and that is all they care to do. The Japanese seem to be following on similar lines. It would be amusing were it not so pitiable."—Chemical News.

Recent Archaeological News.

M. Perce recently informed the Paris Society of Civil Engineers that Alexander the Great employed the first submarine boat at the siege of Tyre in the year 332 B. C.

Italian engineers have found that the two Roman vessels discovered in Lake Nemi can be raised without too great difficulty, and the government has taken measures to have this done soon.

Russia's archaeological congress is presided over by a woman, Countess Praskowja Sergejewna Uwarow, widow of Count Alexis Uwarow, who founded the society in 1869, and herself a distinguished archaeologist. She makes a model president, listening to all the papers and summing them up intelligently.

Probably the earliest known example of piece moulding among European bronze foundries is a mould for a spear head, which was found at Thonon, France, among the relics of the lake dwellers. It is described by Mr. George Simonds as having been composed of two slabs of stone, on each of which a spear head was cut out to a proper depth. The two stones, being placed face to face and bound together, would form a very simple but close mould from which many casts could be taken without injury to the mould itself.

Sir Joseph Archer Crowe, the distinguished English journalist, war correspondent, diplomatist and art critic, died on September 7. His title to fame rests not so much on his work as diplomatist as on his writings. In connection with Signor G. B. Cavalcaselle he wrote a monumental series of works on the art of the Italian Renaissance. These books include the two histories of painting in Italy, the Raphael and the Titian. The works are specially noted for the use which is made of documentary evidence, so that, while much of their criticism is out of date, they will never be entirely superseded.

In the ancient city of Nuremberg, during the year 1859, there were found under the pavement of one of the streets a large number of burnt clay dolls, figures of knights on horseback, and even dolls' toys, which give us a very clear idea of how the children of the fourteenth century amused themselves. Naturally, the boys and girls of the middle ages were not so fastidious as those of this age of luxury, says the Pottery Gazette. Colored eggs, painted birds carved out of wood, little windmills with movable sails, and baked clay shapes of all kinds of animals were regarded as possessions to be highly prized.

M. Berthelot recently read a paper before the French Academy of Sciences on "The Copper Mines of Sinai, Worked by the Ancient Egyptians," says the Engineer. These mines are near the coast of the Gulf of Suez, and are undoubtedly the most ancient known to history, having been worked at least 5,000 years before the Christian era. They were abandoned about 3,000 years ago, on account of the small amount of copper present in the ores. The reduction appears to have been carried out by methods not differing essentially from those in use at the present day, wood being used as the reducing agent, together with fusible silicates.

During 1897-98 it is proposed that the archaeological survey operations in Madras should embrace the most important monuments in the Tinnevely district, many of which are of great interest. The number of places which it would be possible to visit is contingent to a great extent on the amount of work, to be ascertained after inspection. Among the chief remains of interest are those at Sattur, Sankaranayanakovil, Virasakamani Kalugumalai, Kuttalam, Tenkasi, Korkai, Maramangalam, Srivaikuntam and the Valavanad Hill, consisting of temples, ancient city sites, rock cut caves, monolithic temples, Jain sculptures and inscriptions, cairns, Siva and Vishnu temples, sepulchral and other remains. The most extensive work will be in the great Siva Temple in Tinnevely town. Government has approved of the programme.—Indian Engineering.

The theory and construction of the vases which were formerly employed in Greek and Italian theaters to aid the acoustic effects of the building remain as puzzles, says the Architect and Contract Reporter. All that is known about them is what Vitruvius reports, which is as follows: "Of the brazen vases, which are used on account of the magnitude of theaters, they are so formed that upon being struck they sound in themselves the notes diatessaron, diapente and so in order to disdiapason; after which they are disposed, according to the laws of music, in cells, formed within the seats of the theater in such a manner as not to touch the wall, and have a vacancy all round them to the top of the cell. They are situated inversely, and on the side which is turned toward the scene; they are supported by wedges, not less than half a foot high; also opposite the cells, in the beds of the lower seats, apertures are left two feet long and half a foot high. Rome has not any theater thus constructed, but the provinces of Italy and many provinces of Greece can show them. Lucius Mummius, who destroyed the theater of Corinth, brought to Rome the vases of brass which were used at the plays acted in his triumph; likewise many ingenious architects, who construct theaters in small towns, to save expense, make use of earthen vessels to help the sound, which, being adjusted according to rule, answer the purpose."

Cycle Notes.

The African Cyclist has just been started at Johannesburg, Africa, where cycling is said to be in a very flourishing state.

The French Touring Club now has 42,000 members. Many Americans belong to it, although they may not have any immediate intention of traveling abroad.

Paris is going ahead in the matter of catering for cyclists. In the beautiful Bois de Boulogne there is now a special avenue, over a mile in length, which is exclusively reserved for cyclists.

It is said that the patrons of a large tourist agency, whose business is world embracing, will in future be mounted on bicycles when the tourists prefer that mode of locomotion in the excursions in foreign cities.

An Eastern concern has recently brought out a rack for bicycles, which may be used either in baggage cars or upon the dash of street cars. It folds flat against the wall or dash when not in use, to economize space, occupying in that position only four inches in depth. The parts of the holders which come in contact with the wheel are covered with rubber to insure against scratching.

According to a recently published Trades Directory there are in England no fewer than 5,270 cycle agents, in Scotland 512, and in Ireland 512; and the total number of makers, both small and great, is set down as 2,595. In addition to these figures it is of even greater interest to learn that there are 46 newspapers and periodicals directly connected with cycling in the United Kingdom.

The capacities of the leading steel tube mills in this country, for bicycle work, is far beyond the consumption. It is estimated that 24,000,000 feet of steel tube have been used this year, but there are seven mills and one of them alone can turn out 18,000,000 feet: the combined output of the other six mills amounts to 64,000,000 feet, so the bicycle makers have to treble their product before they can fill the mills with orders.

The Czar of Russia has been traveling considerably of late and paying his respects to the rulers and the peoples of Western Europe. When traveling the Czar receives a courier every day from St. Petersburg, bearing dispatches, and he sends one back in return. Some of the work of these men on a pinch is done on bicycles, for the Czar rides himself and takes a great interest in the bicycle. He took careful note of the good roads of England, and was unstinted in his praise of them.

An enterprising bicycle dealer of Berlin recently applied to the authorities for permission to erect 250 stands all over the city and suburbs where bicycles and tricycles can be hired. The wheels hired can be returned to any of the stands and the amount to be paid is regulated by coupon checks. The hire of a machine is only 10 pfennige (2½ cents) for the first 15 minutes and 5 pfennige for every additional 10 miles. A mark is deposited when the wheel is taken out. The wheel is specially marked and painted.

A young man has put his bicycle to profitable use in Australia. He has practically established a postal route between Coolgardie in the center of the gold fields and Dundas, the nearest town. The distance between the two places is 280 miles, but he carries letters and telegrams backward and forward in a small letter box strapped on the back of his machine, for one shilling and five shillings apiece, respectively, making the trip once a week. A water bottle, revolver and sharp knife are the chief items of his outfit—essentials in that arid and bushranger-infested country.—Postal Record.

An ingenious device has been employed in the West to keep cattle off of cycle paths without interfering with the free use of the path by wheelmen. At each road crossing a gate is placed, which is usually kept locked, but may be opened on the occasion of parades or on holidays. At the side of the gate is a "cattle guard" constructed in this manner: A pit about three feet by four and two feet deep is dug. At the top of the pit an oak frame is set, and across it, on a level with the top, is placed a row of two inch gas pipes, two inches apart. Across these pipes a bicycle can be ridden with ease, almost without jolting the rider, while cows, horses, sheep, etc., find it impossible to cross the barrier.

Hydrostatic Exploration of the Abdomen.

M. Marc Sée has communicated to the Académie de Médecine, says the Lancet, a method of exploring the abdomen which he claims to be new and which is certainly ingenious. Anyone can see for himself, says M. Sée, that when completely submerged in a bath his anterior abdominal parietes become quite flaccid, even if he should be moderately corpulent. The various organs and structures beneath can then be recognized and delimited by simple palpation with greater facility and accuracy than is afforded by any other system of exploration. The relaxation is explicable on ordinary hydrostatic principles. The abdominal walls, loaded as they are with fatty matter, tend to float upward toward the surface of the water, thus to a certain extent counteracting the elastic and contractile forces which tend to keep them in close contact with the viscera.