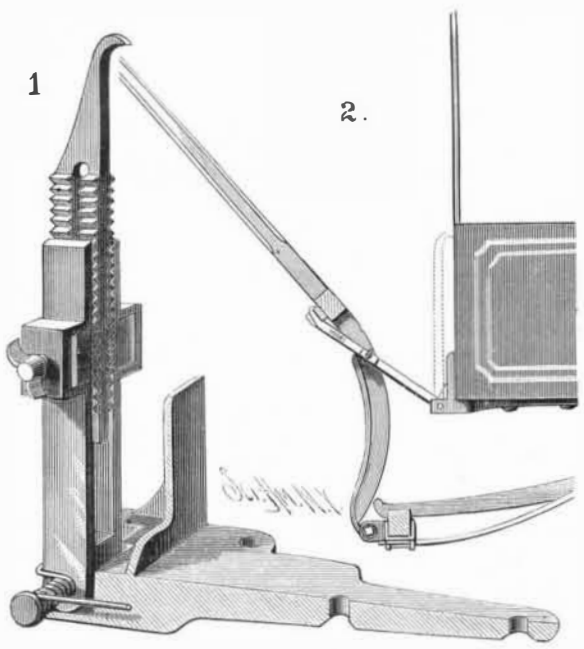
SHAFT SUPPORT.

The invention herewith illustrated was patented by Mr. James F. Pace, of Arcadia, La., and consists in a bar pivoted to the front of the vehicle and forced upward by a spring so as to press against the cross bar of the shafts and hold them raised. Near one end of the plate screwed to the bottom of the box is a standard adapted to be fastened to the dash-board. At the front end of the plate is a recess to receive the end of a fork, which is held in place by a bolt around which a powerful spring is coiled. The spring passes under and forces the fork upward, and its ends are secured in

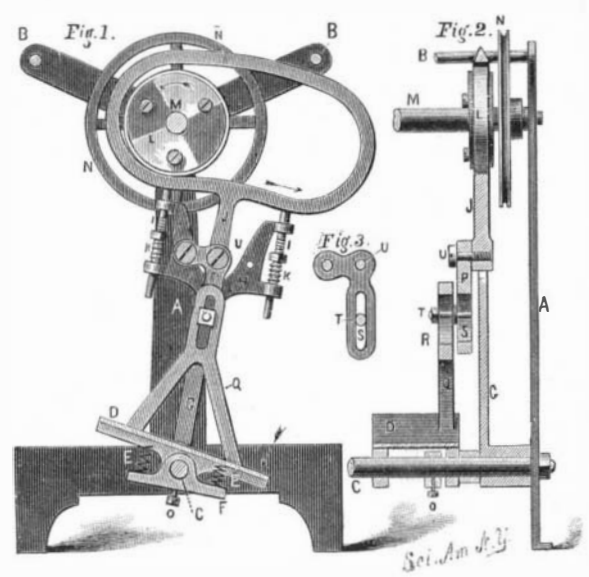


PACE'S SHAFT SUPPORT.

the plate. Each shank of the fork (shown enlarged in Fig. 1) is provided with a bend which forms a recess to receive clamp plates whose adjoining surfaces are transversely serrated. A right and left hand screw is held to turn in the bends, and is passed through the plates and through a longitudinally slotted bar, both sides of which are serrated. On the free end of this bar is an upwardly projecting hook, which enters a notched plate on the under side of the cross bar of the shafts. The bar is adjusted until its hook can pass into the notch, when it is clamped and held firmly between the serrated plates. The bar and fork are swung down, the shafts raised, and the hook passed into the notch; the fork and bar are pressed upward by the spring, and the shafts are held in a raised position. The dotted lines in Fig. 2 show the position of the fork and bar when not in use.

FOOT POWER.

Our engraving shows an improved foot power, to be used in place of the usual treadle crank and connecting rod for operating machinery by foot. The standard, A, united by top rods, B, and a bottom central shaft, C, form a frame. Rocking upon the shaft is a foot plate, D, whose ends are pressed upward by spiral springs held between the plate and a cross bar, F, held on the shaft by a binding screw by which the bar may be adjusted according to the inclination of the plate in its normal position. An upwardly projecting bar, G, is loosely mounted at its lower end on the shaft, and has a fork formed on its upper end, from the outer edge of each prong of which apertured lugs project. Through these lugs pass rods, K, projecting downward from the bottom



FIELD'S FOOT POWER.

of a curved frame, in the opening of which a friction wheel, L, having a rubber ring is located, and which is mounted on the driving shaft.

The diameter of the wheel is a little less than the opening in the frame. Spiral springs, surrounding the rods, K, are held between the lower lugs and nuts on the rods, and press the frame upward. From the bottom bar of the frame projects an arm, J, whose end is pivoted to the angle of an elbow lever, P. The upper arm of this lever is pivoted to one of the prongs of the fork, H, and the other arm is furnished with a longitudinal slot, S (Fig. 2), through which and the slot in the standard, Q, passes a pintle by which the pressure upon the wheel, L, can be regulated.

When the lower end of the foot plate is depressed, the swinging part of the device is moved in the direction of the middle arrow, and the standard, Q, which is independent of the arm, G, swings the lower end of the elbow lever in the direction of the arrow, thereby raising the curved frame and bringing its bottom bar in contact with the rim of the wheel, L, which is revolved in the direction of its arrow. When the opposite end of the foot plate is depressed, the swinging part is moved in the contrary direction, the angle lever is moved downward and also the frame, thereby bringing the top bar in contact with the rim of the wheel. The motion can be reversed by pivoting the angle lever to the other prong of the fork.

This invention has been patented by Mr. Henry Field, Jr., of New Bedford, Mass.

Natural Gas for Glass Making.

In the vicinity of Pittsburg, Pa., the use of gas drawn from the gas wells has been applied in the manufacture of glass. The *Glassware Reporter* says:

"It seems to us that the advantages of natural gas in the manufacture of glass are liable to be exaggerated, especially in so far as they act as an incitement to investors to erect factories in remote and inaccessible places, solely on the strength of the gas supply alone. To those who have any intention of going into the glass business on such grounds, we desire to say that the idea that cheap fuel is a considerable factor of success in the pursuit of glass making is a mistaken one. On a fair average, even if fuel were to be had for nothing, such an advantage would amount to only about five or six per cent of the total cost of operating a factory. This advantage is more than offset (in the case of factories started in the outlying districts) by the drawback of remoteness from market, and the lack of many conveniences, which can only be promptly had in the largely manufacturing centers. Take Pittsburg here for example; if a manufacturer breaks a shaft, or a driving belt, or other machinery, he can have men at work on repairs in half an hour from the time of the accident, whereas in country places such a mishap might necessitate his shutting down for a day, or even two or three. Of course, the places in the immediate vicinity of Pittsburg enjoy equal facilities with that city itself, but we have reference principally to more remote districts.

"With regard to this gas itself, its great unreliability and unsteadiness of pressure make it a very inconvenient fuel to use at times, and the saving of labor which was promised to result from its use has not been made manifest so far, for the men that attended the fires when coal was used have now to look after the gas, and see that its pressure is uniform and regular. We do not wish to be understood as underestimating or seeking to depreciate the value of this fuel, for it is undoubtedly very valuable, but there are many improvements necessary in the methods of its transmission from the wells to the consumer that must be adopted before it will so greatly surpass coal in cheapness and efficiency as to cause any perceptible cheapening in the cost of producing glass. We know one manufacturer, outside of Pittsburg, who has used natural gas largely, and as the result of his experience he expresses a wish that he had never seen it, so much trouble and inconvenience did it cause him. The gas industry (if so it may be called) is, however, young yet, and, like all new things, works crudely and unsatisfactorily at first, but doubtless improvements in the methods of application, control, and other particulars will be made, which will eliminate all or most of its disadvantages, and bring it to the front as an important adjunct to our manufacturing industries. It is cleanly, easily applied, and leaves no residue of dust or ashes, all of which are great advantages, but intending manufacturers who imagine that because they have an abundance of fuel they have everything, will not find this belief corroborated by actual experience."

IMPROVED JOURNAL BEARING.

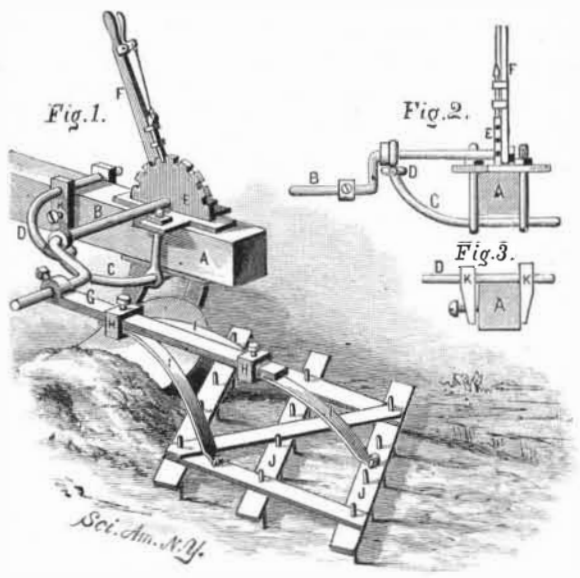
In the journal bearing shown in the accompanying engraving the block may be tightened up from time to time, as the bearing wears away, without disturbing the cap, and the box is secured to the bed frame by the same bolts that are employed to hold the cap permanently in place. Fig. 2 is a plan view, Fig. 1 a sectional elevation parallel to the journal, and Fig. 3 a section perpendicular to the journal. The bearing block, C, is fitted in a cavity in the cap, through the top of which pass adjusting screws, E, provided with jam nut, F, so that any wear may be taken up. This construction permits of extending the bolts, J, through both the cap and box to the frame. Lateral play of the block, C, is prevented by one or more set screws, K, which pass through one side of the cap and press the block against narrow faced ribs in the opposite wall of the cap, the block being provided with corresponding ribs. These ribs and the screw insure the proper lining of the block with the journal, and the latter effectually prevents side play of the block. The manner of oiling the journal is clearly indicated in the cut.

This invention has been patented by Mr. J. M. Elliott, of Winnsborough, S. C.

COMBINED PLOW AND HARROW.

In the combined plow and harrow lately patented by Mr. E. O. Long, of Hayesville, O., the plow beam and harrow are connected by a crank rod, a connecting rod, and a set of springs—the crank rod being secured to the plow beam and held against the draught strain of the harrow by braces, and the springs and connecting rod being so connected by bands and set screws that the harrow can be readily adjusted.

The rod, B, works in bearings formed upon a plate attached to the beam by bolts, and also upon the brace, C, which passes through the eyes of the bolts at the lower side of the beam. The arrangement of these parts is plainly shown in the sectional view, Fig. 2. The curved brace, D,



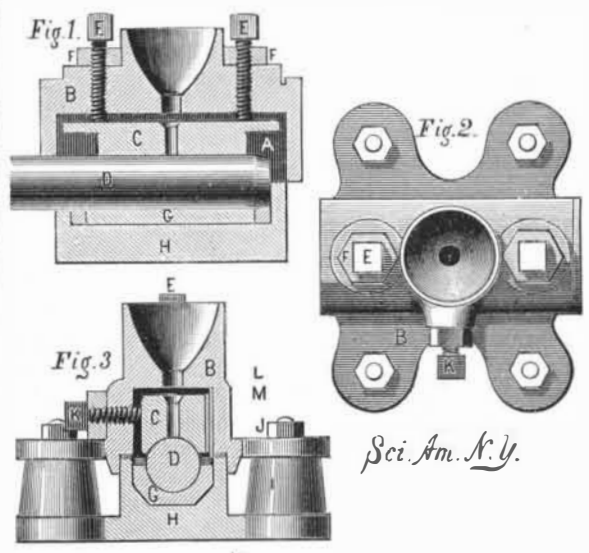
LONG'S COMBINED PLOW AND HARROW.

has an eye formed in its outer end through which the brace, C, passes, and at its other end is provided with two arms, K (Fig. 3), by which it is clamped to the beam, as indicated. The outer part of the rod, B, is bent into crank form and passed through an eye in the forward end of the bar, G, which is held in place by a set screw. To the bar, G, at a little distance from the rod, are secured by a band and set screw the forward ends of two springs, I, whose other ends are attached to the forward part of the harrow. A third spring is secured to the bar, G, and to the middle of the rear part of the harrow. The harrow frame is strengthened by one or more braces, and is provided with teeth in the ordinary manner.

With this construction the crank rod can be readily attached or detached from the plow beam, and the harrow can be adjusted nearer to or further from the beam, as may be required. The springs hold the harrow down to its work and allow it to rise in case it strikes an obstruction. The crank shape of the rod allows it to be adjusted to a plow beam of any height. The inner end of the rod is made eight square, and to it is fitted the detachable lever, F, which moves along the side of a catch plate, E, provided with notches which engage with a pawl sliding in keepers on the lever. By moving the lever the harrow can be raised to allow it to pass obstructions and when turning round at the end of the furrow.

A Prehistoric Human Tooth.

The annual report of the Peabody Museum chronicles the finding of a human molar tooth, by Dr. C. C. Abbot, in the



ELLIOTT'S IMPROVED JOURNAL BEARING.

gravels near Trenton, affording paleolithic implements. It is a rolled and worn tooth, and is therefore of the same age as the implements. Dr. Putnam, Curator of the Museum, says that the discovery of the tooth removes the little doubt there was about the gravel bed origin of the portion of a human skull obtained some years ago at Trenton by Dr. Abbot from a person who stated that it was found in the gravel.

Plant Culture in Moss.

A novel feature, and one that attracted some attention at the recent Regent's Park show, was some baskets of plants said to have been grown in prepared moss and entirely without soil. The exhibitor was Captain Halford Thompson, who claims to have discovered a new method of thus growing plants. Some time ago a Frenchman of the name of Dumesnil patented a kind of fertilizing moss for the purpose of growing plants without soil. With this production of M. Dumesnil, Captain Thompson states that he made several experiments, which resulted in his considering it open to serious objections, and was by no means certain in its results. These defects Captain Thompson has endeavored to remedy in a new preparation with which he has experimented, and by means of which he states he produced the luxuriant plants which he exhibited on Wednesday. Having found that by Dumesnil's moss it was quite possible to grow plants without soil, he set to work to prepare a fertilizing substance which would enable plants to be grown in it without the precautions necessary in using Dumesnil's moss, and he thinks that he has been perfectly successful in his endeavors.

He states that "plants in full bloom can be taken out of the ground or out of pots, and after all the earth has been carefully washed off, planted in moss which has been previously prepared with fertilizing fiber. They never even flag, but grow more luxuriantly than in soil." The plants shown by Captain Thompson fully bore out his statement, for it would be difficult to imagine more luxuriant plants than those he showed. They consisted of tuberoses, begonias, variegated vitis, gardenias, fuchsias, tradescantias, and others. All were furnished with healthy foliage, and were for the most part carrying flowers. The advantages of this method are stated by the inventor to be two-fold; first, the extreme lightness of a number of plants when grown together in one basket; another is the portability, an advantage which renders plants grown in this way particularly suitable for the embellishment of rooms and windows. No doubt to those who live in towns, where potting soil is not easily procured, this moss would be a special boon, on account of its lightness, portability, and cleanliness; but in the country, where mould is readily obtained, it would probably be less trouble to grow plants in the usual way, and we presume that Captain Thompson's invention commends itself to townspeople. In a small pamphlet the method of applying this moss is explained as follows:

"Take the plants you wish to put into the basket, carefully wash off all earth from the roots with tepid water, taking care not to injure the roots in doing so; then plant them in the ordinary way in the moss, which should be previously well wetted; if possible, keep the basket in a warm place free from draught for three or four days. The plants can, if wished, be transplanted from earth when in full bloom; they will not feel the check. After two months the upper layer of moss should be removed, and a similar quantity of my moss put in its place. If selaginella is grown on the surface of the moss (as in some of the baskets shown before the Botanical Society), it should be carefully removed first and replaced after the moss has been changed. The baskets do not require watering oftener than plants grown in earth do. The weight of the baskets will show if they want water."—*The Garden.*

Burning of the Dead.

The body burns, whether placed in the earth or fire; in one case it takes 10 to 20 years, and in the other so many minutes. Cremation is the proper and scientific way to dispose of dead organic matter. When the body is cremated, there is no further fear from disease germs in the body. The only plausible objection which has been offered against cremation is that in case of homicide through the administration of deadly poisons valuable evidence might be destroyed; but this is not a serious objection in the face of the many advantages gained. All innovations in sanitary science have had to fight their way inch by inch. Vaccination had a hard struggle, but came out triumphant, and so we predict for cremation a glorious victory, a triumph of good sense and science.—*Ionia Sentinel.*

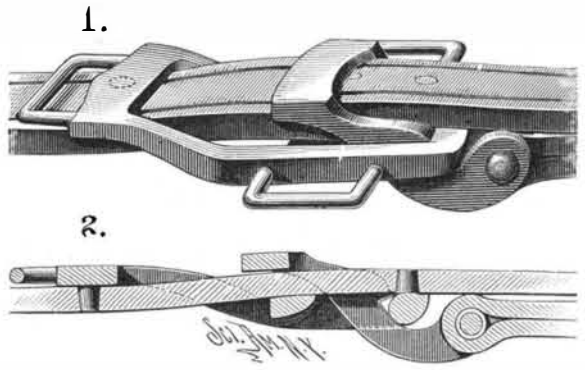
Selling Eggs by Weight.

There seems to be no good reason why the general practice of selling eggs by the dozen should not be superseded by the more rational one of selling them by weight. There is from twenty to thirty per cent difference in weight of eggs, yet the custom is almost universal in the Eastern markets of selling them by the dozen at a uniform price. Even ducks' eggs, which are much larger and regarded by some as richer, bring no more than the smallest hens' eggs of not half the weight. In California, eggs, fruits, and many other articles that are here sold by the dozen, the bunch, or by measure, are sold by weight. The practice, says the *American Agriculturist*, is a good one, and works beneficially for all parties, especially for the producer. It operates as a premium upon the cultivation of the most productive varieties of fruits, vegetables, and farm stock. The farmer who is painstaking with his poultry and gets the largest weight in eggs has a fair reward for his skill and industry. The present custom is a premium to light weight and good layers. We need a change in the interest of fair dealing in trade, and if necessary it should be enforced by legislation. If the Legislature is competent to fix the weight of a bushel of corn or potatoes, it can easily regulate the weight of a dozen of eggs, and thus promote exact justice between buyer and seller.

While this would to a certain extent be a more equitable arrangement, it is, nevertheless, wrong in principle, from the fact that the weights of eggs do not vary directly as their diameters, but as the cubes thereof, and unless the price were graded in the same ratio the system would not be an equitable one. Taken altogether, there seems to be no more just or simple way than selling eggs by weight.

TRACE BUCKLE.

The main part of the buckle is made in skeleton form and of considerable length, with end and center cross bars, and is curved outward at its rear end to permit the tug to pass under the first cross bar and over the others. The end cross bars are provided with tongues, which project in opposite



BAUDER'S TRACE BUCKLE.

directions, as shown in Fig. 2, and which pass through suitable holes made in the tug. The forward part of the buckle —termed by the inventor the "grip loop"—is attached to the hame tug by a bolt, and the side bars of the loop are bent so as to pass up through the main part between the cross bars, and allow the tug to pass through it under its cross bar. The outer edges of the sides of the loop are formed with notches, which receive the lips formed upon the edge of the end cross bars, thus fulcruming the loop so that its cross bar will grip the tug upon the center cross bar of the main part of the buckle. The notches and lips also serve to always maintain the proper relative positions of the main parts of the buckle, and to prevent the tug from being injuriously compressed and worn by the bar of the loop. Constructed in this manner the buckle is very durable and easy on the tug, which is readily adjusted.

This invention has been patented by Mr. C. C. Bauder. Further information may be obtained by addressing Messrs. Bauder Bros., at either Sanborn, Dakota, or Burnside, Ill.

UMBRELLA AND PARASOL FRAME.

The ribs are pivoted to a ring secured to the stick near the end. The braces, D, are pivoted to a sleeve sliding on the stick and to lugs on the ribs. This sleeve is not provided with the usual slot, and the stick has no spring catches. The outer ends of the braces are flattened, forked, and squared; and on each rib is soldered a semitubular forked piece, C (shown enlarged in Fig. 2), in such a way that one shank will be at each side of the lug. The opposite squared edges of the ends of the braces rest against the bottom edges of the spring shanks, H. When the umbrella is opened, the bottom edges of the shanks rest against the straight upper

CARRARA'S UMBRELLA AND PARASOL FRAME.

edges of the ends of the braces, and thus hold the various parts in place. When the umbrella is to be closed the sleeve is drawn down, thereby causing the upper ends of the braces to turn on the lugs; and when it is closed the opposite or upper edges of the flattened ends of the braces will rest against the spring shanks, and hold the parts in their new position. By this means a cheap, simple, and effective construction is secured.

This invention has been patented by Mr. Antonio Carrara, and additional particulars can be obtained by addressing Mr. Alfred Girardot, of 35 East Kinney Street, Newark, N. J.

The Deflection of Streams by Terrestrial Rotation.

The influence which the rotation of the earth exerts upon bodies on its surface, free to respond to it, has long directed the attention of scientists to discover whether streams in their course show any tendency from this cause to act more upon one bank than upon the other.

It was long ago perceived that rivers flowing to the north or to the south should by the rotation of the earth be thrown severally against their east or west banks. It is even many years since it was shown by Ferrel that these tendencies are but illustrations of a more general law, that all streams in the northern hemisphere are by terrestrial rotation pressed against their right banks, and all in the southern are pressed against their left banks, the degree of pressure being independent of the direction of flow. Yet the question of the sufficiency of the cause for the production of observable modifications in the topography of stream valleys is still an open one. A number of geologists have observed peculiarities of stream valleys which they referred to the operation of the law, while others have looked in vain for phenomenal evidence of its efficiency.

In an article appearing in the *Amer. Jour. of Science,* a writer asserts that he has finally obtained sufficient proof that such action does take place to an appreciable extent, notwithstanding the attempted demonstration by others that the cause is insufficient to effect any change in banks of a river, due to the increased pressure of the water. Due account must be taken to eliminate the effects of short curvatures in rivers, in obtaining results due to rotation, while a general curvature in the course of a valley through which the stream flows has the same tendency, though in a less degree, as does the curvature of a short bend, and this tendency must in many cases nullify and conceal the results of rotation.

Visible examples of the work of rotation are therefore to be sought especially in streams which, with courses in the main direct, are slowly deepening their valleys by the excavation of homogeneous material. The best locality known to the writer is the south side of Long Island, a plain of remarkable evenness, descending with gentle inclination from the morainic ridge of the interior to the Atlantic Ocean. It is crossed by a great number of small streams which have excavated shallow valleys in the homogeneous modified drift of the plain. Each of these little valleys is limited on the west or right side by a bluff from ten to twenty feet high, while its gentle slope on the left side merges imperceptibly with the general plain. The stream in each case follows closely the bluff at the right. There seems to be no room for reasonable doubt that these peculiar features are the result of terrestrial rotation. As the streams carve their valleys deeper, they are induced by rotation to excavate their right banks more than their left, gradually shifting their positions to the right and maintaining stream cliffs on that side only.

New Zealand Grapes.

There is one kind of fruit that does not grow well in New Zealand, in spite of everything said to the contrary, and that is the grape. It is true enough that grapes are often grown to perfection under glass in many parts of the colony, but they do not grow well in the open air. All the vineyards planted here within the last ten years have resulted in either partial or total failure. In certain localities, it is true, the vine has been cultivated successfully in the open air; but it was under exceptional circumstances and in favorable or sheltered situations. The vine requires heat in the summer to ripen the fruit, and cold in the winter to ripen the wood; but unfortunately the New Zealand climate is without these characteristics, and, moreover, it is so moist or humid that it promotes too much activity in the growth of the vine in the winter, and in the summer the fruit is almost certain, during the process of ripening, to become mildewed. The rainfall is perhaps not too heavy to interfere with the growth of the grape, but it rains on too many days in the year. The chief obstacle, however, in the way of vine culture in New Zealand is the absence of the extremes of heat and cold. The result is that nearly all the grapes found in the market are either imported or grown under glass. Under these circumstances, it is not surprising that this delicious fruit always commands a high price in New Zealand.

New Discoveries in Italy.

M. Le Blant, the director of the School of France, at Rome, has forwarded a communication to the Academie des Instructions, stating that the excavations recently made at Subiaco have brought to light some splendid statues, which appear to have been sent by the Emperor Nero from Rome, for the decoration of his villa in that vicinity. A chamber has been also discovered, hung around with tablets upon which are portraits, in basso-rilievo, of celebrated authors, and probably this room served as a library. But the most important finds have been made near Marino, about 15 kilometers from Rome. The workmen have cleared out chambers adorned with mosaics and variegated marbles, as well as a vast courtyard encircled by a colonnade and long galleries communicating one with the other to various parts of the villa. These covered passages are filled with priceless sculptures, statues, and bassi-rilievi of various designs. Leaden pipes, bearing the imprint of the genitive names of Messalina and Voconius Pollo, probably successive owners of the villa in question, have been also brought to view.