The Distribution of Carp.

The United States Fish Commission have been distributing large numbers of young carp for stocking ponds in various parts of the country. Over 40,000 were sent out during the first ten days of November, and from 50,000 to 60,000 more were awaiting distribution. Among the earlier shipments were 1,000 to Pennsylvania, 2,000 to New York, 6,600 to New England States, 1,200 to Ohio, 12,400 to Kentucky, 1,600 to Virginia, and 16,000 to Iowa and Minnesota.

In reply to inquiries by a correspondent of the *Tribune*, Professor Baird said that from 12,000 to 15,000 carp ponds in all have been stocked since the commission began the work. About 10,000 applications were then on file from different parts of the Union, and new applications were constantly received at the rate of fifty to one hundred a day. As the value of the carp for food, the ease with which it is kept, and the rapidity with which the species multiples, as well as that of its growth, become known in a country or neighborhood, the demand for young fish to stock new ponds of course increases. The hardy constitution of the carp renders its transportation alive and in good condition from place to place an easy matter, and is another strong point in its favor. Small tin buckets partly filled with water are now extensively used for this purpose. Each of these buckets has a capacity of about one gallon, and is fitted with a cover, in which are two small holes for the admission of air. Twenty young fish can make a long journey by express in one of these buckets very comfortably without a change of water. A year or two ago, as an experiment, a common tin bucket containing a few live carp was sent by express to Commissioner Blackford, in New York, with a request that if the fish were alive when he received them he would reship them to Washington without changing the water. He did so, and when they reached Washington again, after a week's absence, the fish were found in good condition and did not appear to suffer after remaining another week in the same water, although the bucket stood in a warm room in the meantime. The small buckets mentioned are much used in sending carp to individual applicants not too remote from Washington. Where a number of applicants live in the same vicinity a dozen or two dozen buckets are packed in a strong wooden crate and sent by express. For larger shipments ten gallon tin cans are used, one of which will accommodate from 150 to 200 young fish.

It has been found by experience that the young fish taken from the water in the spring appear to be more tender and do not bear transportation so well as those taken in the autumn. It is found, too, that the growth of the carp in the South is about twice as rapid as in the North. There is a carp now at the Smithsonian Institution which, as a young fish an inch or two in length, was sent to Georgia and placed in a pond where it remained less than a year, when it was sent back to Washington weighing seven pounds. In the latitude of New York and New England, one of Professor Baird's assistants informed the correspondent the average yearly increase in weight the first year is about three to three and a half pounds. Carp weighing from three to six pounds are occasionally seen on the tables of fish dealers in the Washington markets, having been taken in the Potomac, into which it is supposed they escaped during a season of high water when the carp ponds were invaded by the river. These fish are esteemed a delicacy and sell at good prices.

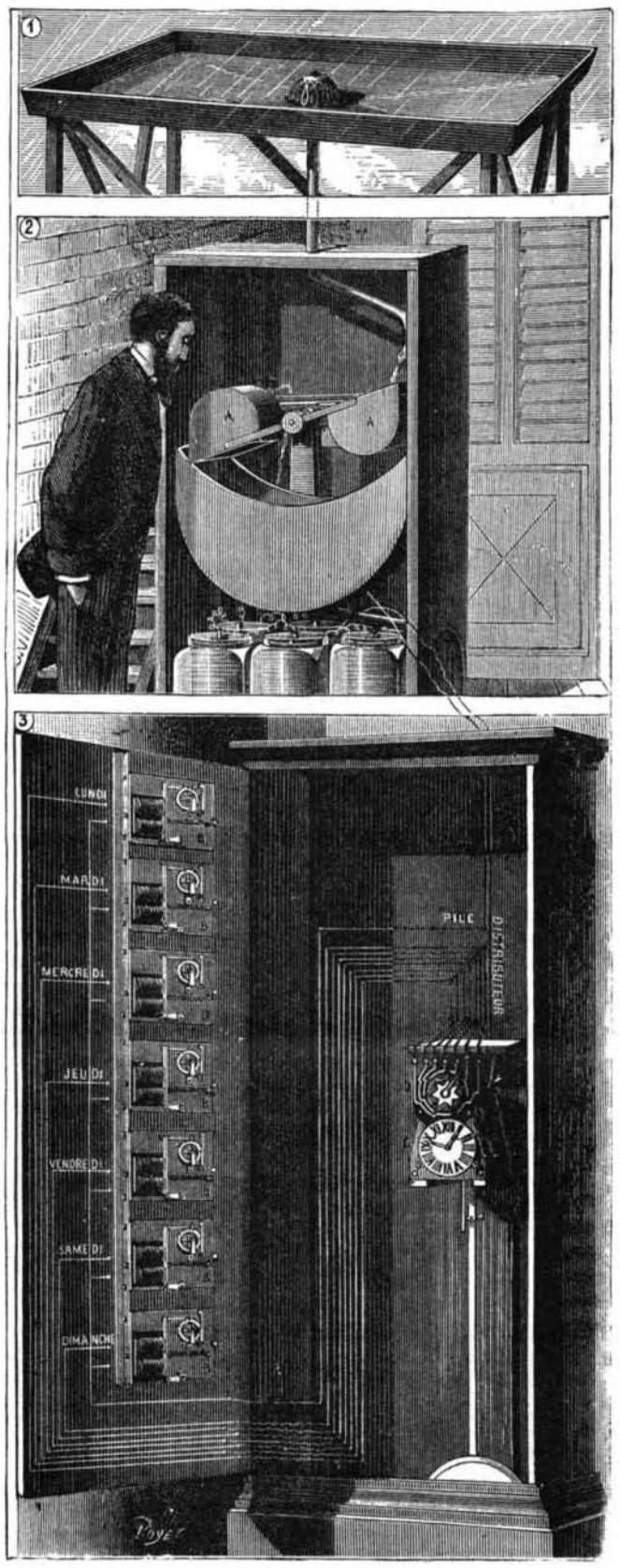
The Weehawken Tunnel.

The bore through the Palisades of the Hudson River, at Weehawken, N. J., opposite New York city, is now complete, though it will probably take six months more of work to finish the tunnel and its approaches. The eastern approach has been cut through solid rock a distance of 150 feet. Its width is 56 feet. The tunnel is 4,000 feet in length, 27 feet wide, and 21 feet high. The greater part of the cutting, 3,400 feet, has been done since January, 1882. The estimated cost of the tunnel was about $1,250,000; but it is thought that the actual cost will amount to much more. The tunnel has been cut in sections, the inner ones from five shafts from the upper surface of the bluff. These shafts, which have an average depth of about 150 feet, will be useful for ventilating the tunnel. Seventy compressed air drills have been constantly employed. A recently invented and very powerful steam shovel has done effective service in removing material and loading cars.

It is estimated that this year's output of the Wood River and Sawtooth mines in Idaho will be about $3,000,000, or double the yield of the entire Territory three years ago.

A Large Driving Belt.

P. Jewell & Sons, Hartford, Conn., have lately finished a four ply belt, 124 feet long, 38 inches wide, and 1 inch thick. It weighs 1,834 pounds. This belt is intended for a rolling mill in the Washburn & Moen Wire Works, Worcester, Mass., and is expected to transmit more than 1,600 horse power from a 24-foot pulley to a 10-foot pulley, with a belt speed of 5,200 feet per minute, almost one mile. The belt is made of the thickest and best selected hides, four of them making the thickness of the belt. These thicknesses are secured by rivets, and the joints by "scarf joints" cemented.



Figs. 1, 2, and 3.—PLUVIOMETER AT THE COMPTOIR D'ESCOMPTE, PARIS.

METEOROLOGICAL APPARATUS AT THE COMPTOIR D'ESCOMPTE, PARIS.

Among the clockwork and meteorological apparatus installed in the "Pas-Perdu" hall of the Comptoir d'Escompte, of Paris, there are a few that have appeared to us to be sufficiently interesting to be brought to the attention of our readers. Among these are a pluviometer and an electrical anemoscope, which, thanks to the kindness of M. Collin, the inventor and manufacturer of one of them, we have examined in detail. We give herewith a sufficiently complete description of them to allow their operation to be understood.

The arrangement of the building precluded the idea of causing the rain to directly actuate the registering mechanism, and the distance from the roof to the apparatus necessitated a series of conduits which, through their length, would have retained an appreciable quantity of liquid, and made the indications of the pluviometer inaccurate. For this reason M. Collin pursued his researches in another direction, and finally decided upon the electrical system, whose arrangement we shall now describe.

The apparatus consists of three parts: (1) a reservoir of given surface for receiving the rain; (2) a distributer; and (3) a registering receiver—the two latter being connected with a pile by an electric circuit.

The reservoir (Fig. 1), of a superficies of one meter, designed to collect the rain, is placedon the roof. Immediately beneath it, in the top story of the building, is installed the apparatus which we call a distributer, and into which flows the rain water that actuates it by its weight. This apparatus (Fig. 2) consists of an axle revolving upon two bearings, and carrying, fixed by the middle, an arm at each of whose extremities is adapted a small bucket, A. In a normal state the arm is almost horizontal, and there is always one bucket in a position to receive the rain water coming from the collector on the roof. Upon the same axle there is a piece with four cams, upon which there acts, to hold the axle, a lever carrying a regulating weight. This lever allows the axle to revolve under the influence of the weight of water contained in the bucket only under a pressure of a weight of 500 grammes, this corresponding to a layer of water of a half-millimeter in depth over a surface of one meter. Then every time a bucket turns over and empties, a half-millimeter has fallen on the roof.

Upon the same axle, again, there is a small ebonite cylinder carrying two strips of metal, two millimeters in width, set longitudinally into the whole length of the cylinder. Perpendicular to the axle there are two insulated strips of metal, carrying two terminals for the electrical circuit. The extremities of these strips rub over the cylinder without making a contact between them; but, when the axle in revolving presents one of the metallic parts to the friction of the strips, the latter became united metallically, and the rotary motion of the axle is shown by a closing of the circuit.

The receiver (Fig. 3), located in the grand hall on the ground floor, consists of a series of seven sets of wheelwork, B, B, B, etc., analogous to the counters employed in electrical clockwork. To each of these there is adapted a dial (seen externally in Fig. 6) which carries one of the following inscriptions: *Monday*, *Tuesday*, *Wednesday*, etc., up to *Sunday*. These dials are divided from 1 to 20 by figures, between which are a certain number of points, the figures representing millimeters and the points semi millimeters. The mean of the rain that falls per 24 hours in the latitude of Paris being 15 millimeters, this division is sufficient. It is upon these dials that are registered the electric currents sent by the distributer; but the rain that falls on Monday must be registered on the one carrying such an inscription, and so on for all the rest. To effect this, a clockwork regulator, I, whose mechanism actuates a circular commutator, D (Fig. 3), receives the electric currents coming from the distributer, and transmits them to the receiving dial that corresponds to the proper day. This commutator is arranged in the following way: Upon an ebonite disk there are fixed seven arcs of a circle, the unition of which constitutes a flat ring, each part of which is insulated and carries a terminal to which is attached a wire that runs to one of the seven receiving dials. In the center of the seven metallic parts there is an insulated axis to which is attached the copper wire coming from a pile whose zinc wire is connected with the distributer. This central axis is moved by a jumper that makes it revolve a seventh of a revolution every twenty-four hours, at midnight. It carries an index, or, better, a flexible strip whose extremity rubs against the arcs. The electric current sent by the distributer (Fig. 2) enters the regulator, C, then (Fig. 3) through the central axis, and escapes

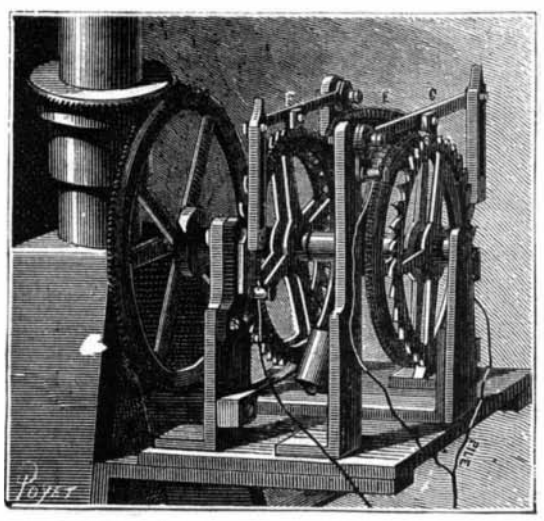


Fig. 4.—DISTRIBUTER OF THE ELECTRICAL ANEMOSCOPE.

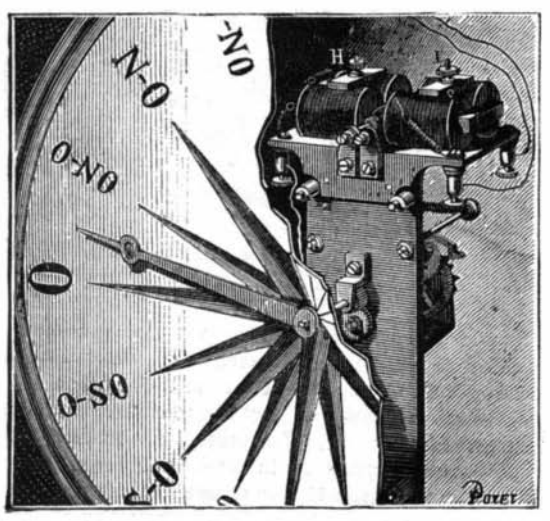


Fig. 5.—RECEIVER OF THE ELECTRICAL ANEMOSCOPE.

through one of the seven terminals, and this directs it to one of the seven counters, B, upon whose dial it is registered.

The indications that show the quantity of rain that has fallen remain, then, upon the dials; and these, in order to furnish new indications eight days afterward, must be set again at zero. For this purpose the commutator is made to act by double contact, and, at the instant at which it causes the circuit to pass from the Monday dial into that of Tuesday, for example, it sends into the latter a current that has the effect of ungearing the wheelwork and allowing a spiral spring to carry the index-hand back to the zero or starting point.

M. Collin has not had time to render his apparatus complete by adding to it a totalizing counter, which, connected with the line wire, would have indicated the passage of all the currents coming from the distributer and passing into any one of the dials. In this way there would have been obtained the total quantity of rain that falls during the year, without the necessity of transcribing each week the indications of the seven dials.

The electrical anemoscope which we shall now describe, and which is the invention of M. Bisson, consists of two apparatus, a distributer (Fig. 4) and receiver (Fig. 5). The former of these, which is located in the cupola of the campanile, is arranged as follows: Upon the rod of the weather vane, which enters into the interior of the cupola, and which, revolving upon an agate, participates in the motion of the vane, there is mounted a horizontal cone wheel that gears with a second and vertical one. This latter is mounted upon an axle which carries at the same time a planet wheel, E, that gears with two like wheels, F and G. These latter are loose on the axle to which the planet wheel is fixed. As the result of such an arrangement, in the motions of the planet wheel around the axle if one of the wheels, F, G, is held, the other is carried along, and *vice versa*. Each of the wheels, F, G, carries a ratchet wheel, upon which rests a contact lever that performs at the same time the rôle of a click, so that the motion of the vane in one direction or the other can carry along only one of the two wheels, and consequently send electric currents brought about by the contact levers only into one of the two line wires that start from the latter to go to the receiver. The keys which close the circuits with the lever are connected with an ordinary electric pile.

As we have just seen, the motion that actuates the wheels, F, G, comes from the central axle, which is itself carried along by the rod of the vane.

The receiver (Fig. 5) is constructed upon the same principle, which allows of a circular motion to the right or left; but, as it is necessary to reproduce here the motions of the vane exactly, that is to say, those of the axle of the planet wheel, operations take place in an opposite way. To effect such a result, two electro-magnets have their armatures arranged so as to actuate two wheels like those of the distributer (F and G), although here these wheels have no contact levers or ratchet wheels, the armatures performing the part of clicks. The line wires starting from the distributer terminate at these two electro-magnets, whose second wire is fastened to the pile. The two wheels that are actuated by the electro-magnets gear with a planet wheel whose axle communicates its motion to an index, which, representing the vane, indicates upon a rose the direction of the wind.

The mechanism, instead of being carried along by the axle, as in the distributer, is moved along by the action of the armatures upon the wheels and planet, all the angular motions of the vane producing series of electric currents that bring about like angular motions of the index, whatever be its direction.

Fig. 6 represents the registering apparatus located in the Pas-Perdu hall of the Comptoir d'Escompte, and which, thanks to the mechanism that we have just described, permits the public to be constantly informed as to the direction of the wind, the quantity of rain that has fallen, and the state of the temperature.

Opposite the case containing the registering apparatus there is another, the counterpart of it, which supports a clock that gives the phases of the moon by multiple dials, and the hour in the principal cities of the world. In the anemoscope case there is also a barometer.—*La Nature.*

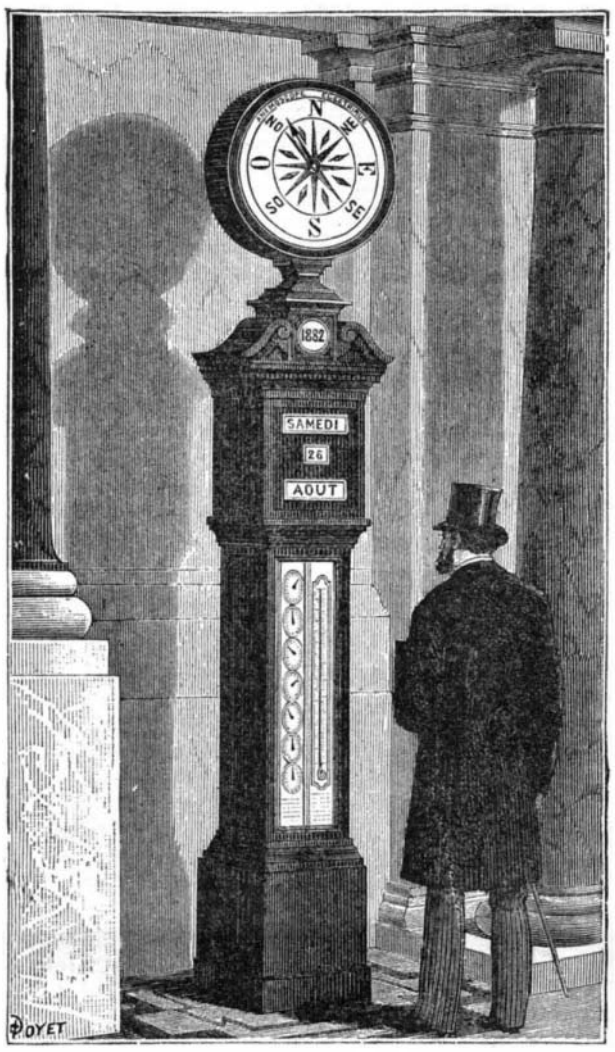
The Sixth Sense.

At a recent meeting of the Anthropological Institute, London, Mr. Francis Galton, F.R.S., exhibited and explained some apparatus contrived by himself, with a view of testing the muscular and other senses. This apparatus consisted of a box, something like a backgammon board, containing trays of weights arranged for measuring the relative delicacy of the muscular sense (the sixth, added by modern psychological science to the five recognized by the ancients) as existing in different persons.

The principle Mr. Galton claimed as a new one. It established, he said, a graded scale of sensitivity, and was applicable, by means of analogous methods, to testing the delicacy of other senses, such as taste and smell. He employed small weights arranged in sequence, which were numbered in succession 1, 2, 3, etc., and differed by equally perceptible variations, as calculated by Weber's law. Hence if a person, A, could just distinguish, say, 1 and 3, he could also distinguish between any two weights two grades apart, as 2 and 4, 3 and 5, etc. Again, if another person, B, were twice as obtuse as A, he would be able to distinguish one grade only where A could distinguish two. In other words, he would be only just able to distinguish between weights 1 and 5, 2 and 6, and so on.

Generally, the number of grades between the weights that any person could distinguish had to be found by trials, and that number became the measure of the coarseness of his sensitivity. The weights used were blank cartridges, filled with shot and wadding, care being taken that the shot should be equably distributed. They were arranged in trays, each tray holding a sequence of three. The person tested had to arrange the cartridges in the tray handed to him in the true order of their weights.

Some provisional results of the plan were mentioned. One



METEOROLOGICAL APPARATUS IN THE GRAND HALL OF THE COMPTOIR D'ESCOMPTE.

was that men had, on the whole, more delicacy of discrimination than women; another, that intellectually able men had more than other men. It further appeared that women sensitive to a morbid degree were not remarkable for their powers of discrimination. Sensation was produced in them by a feeble stimulus, and so was pain, but the intervening numbers of just perceptible differences did not appear in their case to be exceptionally large.

JUMPING SEEDS.

These "flea seeds" were brought to notice some time ago, and were described at length in the *Mining and Scientific Press* and *Pacific Rural Press*. It seems, however, that they have made their appearance in Butte County, and are the

JUMPING SEEDS.

object of some curiosity, being considered something new. As a matter of general information we give an illustration of the "seed" and the insect, and extract from the report of C. Mason Kinne, of the San Francisco Microscopical Society, who followed their development through to the perfect insect. He says:

"The seeds are very minute, presenting the appearance of a mustard seed, and are of a brown color. On placing them in the open hand the 'seeds' jump about from one place to another in a very lively manner. Even when in a phial or small bottle the same characteristic is manifest, and, as they were somewhat peculiar, the 'flea seeds' have attracted considerable attention.

The gall or cocoon is found lightly attached to the leaf of the oak, and in time falls to the ground, when the noise occasioned by the thousands leaping about, without any apparent cause or organs of motion, sounds very much like the falling of fine rain on the leaves. An examination shows that the extraordinary activity displayed is caused by the spasmodic contraction and concussion of the abdominal parts of the occupant against the side of the shell, which movement does not cease even after the covering is nearly split in halves, if the tender structure of the chrysalis be not injured. That it is the chrysalis and not the larvæ has been shown by the microscope, and its change to the perfect insect has been noted at weekly stages."

The average length of the insect is five-hundredths of an inch, and in each has been found from 60 to 80 pear-shaped ova. The engraving gives its general appearance, with wings raised somewhat unnaturally, for the purpose of showing their size and shape. It was drawn on the wood, from the microscope, by Mr. Kinne, and is enlarged twenty diameters. Its ovipositor is a tiny, though perfect, piece of nature's mechanism, and lies incased in a sheath at the lower part of the abdomen. Mr. Henry Edwards, of the Microscopical Society, furnished the following technical description of the curiosity:

"GENUS CYNIPS—*L. Cynips saltatorius* (nov. sp.).—Black, shining. Head broad between the eyes, which are very prominent. Antennæ fourteen, jointed, the first and second joints being much swollen, and the third joint larger than the other two; the remaining joints are long, simple, and nearly equal. Thorax densely but finely punctured, very globose in front, projecting so far as to almost hide the head. Abdomen globose, shining. Ovipositor cases short, spatulate, received into marginal groove in the body. Ovipositor itself flesh color, curved inwardly toward its middle. The abdomen is six-jointed. Terminal joints of palpi hatchet shaped. Tarsi very hairy throughout, the anterior pair with six and the remainder with seven joints. Coxæ very globose. Tibiæ long, with large and powerful spines at the base."—*Mining and Scientific Press.*

Meerschaum.

This well-known mineral, which consists of silicate of magnesia and water, part of which is hygroscopic and part chemical combined water, is chiefly obtained, says the *Industrie Zeitung*, from near the city of Eski-Scheir, in Asia Minor, where it was mined on a large scale even before the time of the Turks. The city is surrounded by a basin, or depression, which was in all probability a large lake, now dried up. All around the borders of this basin are found masses of meerschaum mixed with pebbles and bowlders in a sort of red earth. The stratum forms an angle of 45° with the hill. Between every two strata of pebbles, which are sometimes interrupted by a stratum of earth, there is found a layer of meerschaum. The meerschaum frequently envelops a block of gravel or piece of quartz rock.

The blocks of meerschaum when first mined are wet and dirty, and to fit them for export they must have the earthy crust removed and be dried, polished, and refined. The refining of a lot of one hundred chests requires two months' work on the part of twelve or fifteen persons, and costs about 1,200 florins ($600). The average price at Eski-Scheir for a chest of merchantable ware has varied since 1873 between 160 and 250 francs, and last year (1881) it was 161 francs ($32.20), while the refuse, fit only for converting into a plastic mass, could be had for 23 to 35 francs.

Ten qualities of meerschaum are recognized, and each is to be had of four different sized pieces. A chest 30 inches long, 8 inches wide, and 15½ inches deep will hold from 25 to 40 of the largest sized masses, 100 to 150 of the second size, 200 to 250 of the third size, and 450 to 650 of the smallest.

In the last two decades the exportation of meerschaum has varied considerably; amounting to only 3,000 chests in 1855, and rising to 9,500 in 1870; in 1875 it fell to 8,300, and rose again to 11,100 in 1881.

This quantity is handled by fifteen firms in Constantinople, comprising Austrians, Bulgarians, Greeks, Armenians, and Turks. These send their ware to branch houses or consignees in Vienna, which is the only established market for this article. Vienna's immense importation of meerschaum dates from the middle of the year 1850, when the production of pipes and cigar holders received an immense impetus from the exportation to England, France, and America. At the beginning of 1860 a considerable export of pipes to San Francisco began, while at the same time large quantities of cigar holders were sent to Australia and America *via* Hamburg. Since then the conditions have changed, for the introduction of this article into America has been checked by high tariff duties. By the aid of Austrian workmen that have emigrated thither, an industry has been founded in America which competes successfully with the Vienna pipe manufacturers, of which America was formerly the largest customer. The United States, like France and Germany, obtain most of their raw material from Austria.

Siegfried Adler, in a recent book on Constantinople and its neighborhood, says that for the last ten years there has been a steady decline in the meerschaum business, part of which is attributable to an unstable currency in the place where it is found.

SINCE 1850 eighty-two people have thrown themselves from the Vendome column in Paris.