

SCIENTIFIC MUSEUM.

Agricultural Science.

METHODS OF DETECTING ADULTERATIONS IN GUANO.—As a great number of our farmers are beginning to use guano, and as a great number more are making anxious enquiries about it, the following methods of detecting adulterations in it are from the English Agricultural Gazette, by J. C. Nesbit, F. C. S., Principal of the Agricultural Academy, Kensington:—

“Procure from any druggist a common wide-mouthed bottle, with a solid glass stopper. One known as a wide-mouthed 6-oz. bottle will do very well. Let this bottle be filled with ordinary water, the stopper inserted and the exterior well dried. The scales to be used ought to turn well with a couple of grains. In one pan of the scales place the bottle, and exactly counterpoise it in the other by shot, sand, or gravel. Remove the bottle from the scale, pour out two-thirds of the water, and put in 4 oz. avoirdupois of the guano to be tested. Agitate the bottle, adding now and then a little more water; let it rest a couple of minutes, and fill it with water so that all the froth escapes from the bottle. Insert the stopper carefully, wipe dry, and place the bottle on the same scale from which it was taken. Add now to the counterpoise scale 1½ oz. avoirdupois, and a fourpenny piece; and if the bottle prove the heavier, the guano is in all probability adulterated. Add in addition a threepenny piece to the counterpoise; and if the bottle and guano prove the heavier, the guano may be considered as adulterated. By this simple experiment a very small admixture of sand, marl, &c., is distinctly shown. From many experiments it appears that the amount of inorganic matter, or ash, is from 30 to 35 per cent. This affords another method of detecting adulteration. A small pair of scales, a little platinum capsule, a pair of little tongs or pincers, and a spirit lamp, are all that are required. Ten grains of guano are placed in the platinum capsule, which is held by the tongs in the flame of the spirit lamp for several minutes, until the greater part of the organic matter is burnt away. It is allowed to cool for a short time, and a few drops of a strong solution of nitrate of ammonia is added, to assist in consuming the carbon in the residue. The capsule is again gently heated (taking care to prevent its boiling over or losing any of the ash) until the moisture is quite evaporated. A full red heat must then be given it, when, if the guano be pure, the ash will be nearly white, and will not exceed 3½ grains in weight. If adulterated with sand, marl, &c., the ash will always be colored, and will weigh more than 3½ grains. If the adulteration be made with light or flocculent matters they may be detected easily as follows:—Dissolve in a quart of water as much common salt as it will take up, and strain the solution. Pour a quantity of it into a saucer or basin, and sprinkle on the surface the guano to be tested. Good guano sinks almost immediately, having only a very slight scum. The adulterated leaves the light materials floating on the water. If chalk or ground limestone be used, it may be shown by pouring strong vinegar over a tea-spoonful of the sample placed in a wine-glass. On stirring, effervescence shows its presence. Genuine guano, under the same circumstances, merely allows the escape of a few air bubbles. If farmers could be prevailed upon to spend a small portion of their time in trying the foregoing experiments on the samples of guano they use, the fraternity of rogues would certainly have far less chance than they at present possess for pursuing their calling with profit. Still these simple operations are only offered to the farmer as a means of detecting the grosser adulteration of guano. Minor ones may still be practiced, and men of real intelligence and business habits will regularly call to their assistance the aid of the analytical chemist. Summing up the experiments the following facts would appear:—

1st. If 4 oz. of guano weighed with bottle and water, as previously directed, take more than 1½ oz. and 1 fourpenny piece to re-counterpoise it, its purity is doubtful. If an additional threepenny piece is required, the guano

may be considered as adulterated, and the sample should be immediately analyzed.

2nd. If the ash is colored in any way, and not of a pearl white, the guano is bad.

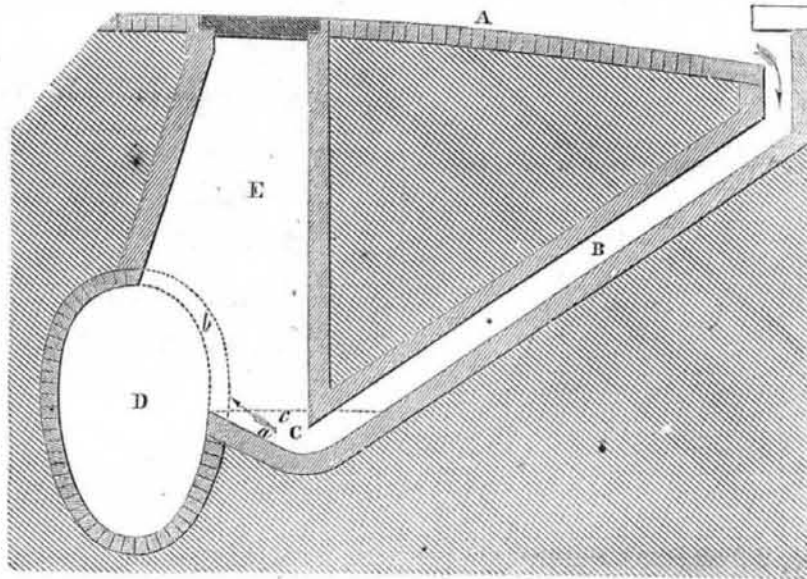
3rd. If the ash of 10 grains weigh more than 3½ grains, or less than 3 grains, the genuineness of the sample doubtful.

4th. If strong vinegar cause a considerable effervescence when mixed with the sample, the latter is adulterated.

5th. If guano float when sprinkled on strong salt and water it is not genuine.”

[There is just as much difference in the quality of guano as there is in other kinds of manure. We have had the enquiry made of us lately, how to use guano. For top dressing Johnson recommends it to be used weight for weight with charcoal powder, gypsum, or dry fine earth. It may also be mixed with wood-ashes.

DAY'S IMPROVEMENT IN STREET SEWERS.



The accompanying engraving is a longitudinal vertical section of the improvement in Street Sewers, invented by Willard Day, of the city of Brooklyn (N. Y.), and patented on the third of last February. A is the street; B is the culvert, which is inclined, as represented. C is the basin at the lower end of the culvert communicating with the sewer. a is the inclined side of the basin; D is the sewer; E is the man-hole, directly over the basin, C, and passing upwards into the street, A. b is the opening or passage that leads from the basin into the sewer. The object of basins to culverts is for the purpose of preventing offensive effluvia arising from the sewer into the street; the effluvia being prevented from passing into the street by the water in the basin that is filled, in consequence of the basin being lower than the passage, b, which leads into the sewer. The dotted line, c, indicates the water line. As the basin is lower than the passage, b, which leads into the sewer, it is evident that dirt and other matter, which passes down the culvert, B, as indicated by the arrows, will acquire sufficient momentum to pass up the short incline, a, and fall into the sewer, thus preventing the accumulation of sediment and dirt in the basin, C.

The culverts at present in use have a fall straight down to the basin, and then an incline

from the top of the basin at the one side direct into the sewer. The nature of this improvement consists in placing the basin at the lower end of the culvert, and adjoining the sewer, in combination with a single man-hole, so placed as to give access to both basin and sewer, as represented by E. The side of the basin that adjoins the sewer is inclined, and so is the culvert, in order to make the gravitating force of water, as it passes down the incline, B, carry over sedimentary effluvia into the sewer; the filling up of the basin is thereby prevented, and the offensive matter, which accumulates and sends up its noxious odors from all our common built sewers, is carried away down, and such evils are thereby obviated, to the general benefit of the community. In case of the basin getting clogged up with sticks or such like impediments to the water, a person can descend by the man-hole, E, remove the obstruction and clear the basin, and the dirt (which is very offensive) can be placed in the sewer, and will be swept away the first heavy rain. Such an improvement in sewers will tend to make our cities more healthy, for there can be no doubt but that offensive sewer odors cause much disease during hot seasons. One man-hole, in this case, may answer for four sewers, where four streets meet, not like the common sewers, which require a man-hole for every sewer at each corner. This improvement in sewers will no doubt soon be generally adopted, as it should be, in all our cities, to the manifest improvement of health and sweet breezes.

More information may be obtained by letter addressed to Mr. Day.

Coffins of Baked Clay of the Chaldeans.
Mr. Kennet Loftus, the first European who has visited the ancient ruins of Warka; in Mesopotamia, and who is attached to the surveying staff of Colonel Williams, appointed to settle the question of the boundary line between Turkey and Persia, writes thus:—

“Warka is no doubt the Erech of Scripture, the second city of Nimrod, and it is the Orchoe of the Chaldees. The mounds within the walls afford subjects of high interest to the historian and antiquarian; they are filled, nay, I may say, they are literally composed of coffins, piled upon each other to the height of forty-five feet. It has, evidently, been the great burial-place of generations of Chaldeans, as Meshad Ali and Kerbella at the present day are of the Persians. The coffins are very strange affairs; they are, in general form, like a slipper bath, but more depressed and symmetrical, with a large oval aperture to admit the body, which is closed with a lid of earthen ware. The coffins themselves are also baked clay, covered with green glaze, and embossed with figures of warriors, with strange

and enormous coiffures, dressed in a short tunic and long under-garments, a sword by the side, the arms resting on the hips, the legs apart. Great quantities of pottery and also clay figures, some most delicately modelled, are found around them, and ornaments of gold silver, iron, copper, glass, &c., within.”

Elephants' Bones.

The laborers on the Great Western Railroad, in Canada West, have dug up the remains of some old elephant in a gravel bank. One of the tusks was 6 feet 9 inches long. Many are wondering how they came there. Those who believe that the axis of the earth was truly perpendicular before the Flood, find no difficulty in accounting for the bones of now tropical animals being found in the arctic regions.

New Kind of Tobacco.

A new kind of tobacco is cultivated in some places in Maryland. It is named Persian tobacco, is of a beautiful color, and commands a high price.

Rifled Muskets.

By late accounts from Europe, the British army was being equipped as fast as possible with rifled muskets; companies of regiments are sent to Woolwich, from various quarters, and they are trained to the use of the rifle, like artillerymen at their guns. The next war in Europe will be a murderous one with bullets. Our regular army will soon have to follow suit, and use the rifled musket too. It is the arm for our marines; they should all be armed with it as soon as possible.

The City of Toronto, Canada, has increased from 1,719, in 1826, to 30,763, in 1852; this is very good, indeed, for Canada, but it is not at all to be compared with Chicago, and many other cities in the States.

LITERARY NOTICES.

SMEE'S ELECTRO-METALLURGY.—Published by John Wiley, No. 18 Park Place. We are glad to see this able book re-published in America; Mr. Wiley deserves credit for it, and for the neat manner in which it is got up; it is from the third London edition. The fame of Alfred Smees is world-wide. The work treats of the different kinds of batteries, their properties, sources of voltaic power, electro-metallurgy in all its branches, batteries for blasting etc.; it contains 41 wood cuts, and is a work that no man, having a taste for science, can be without. Mr. Smees pays a well deserved tribute to the discoverer of amalgamated zinc plates for electric batteries, and he does it in such a manner that we cannot help quoting it, to show that all true lovers of science—men of genius—are democratic, wherever their lot may be cast—in London or New York. He says, “Let us never forget to whom we owe this discovery, which, of itself, enables galvanic batteries to be extensively used in the arts. Ages to come will have perhaps to thank the inventor, whom we are too apt to forget, because he was neither of the Council of the Royal Society nor a London Professor, yet still the obligation to Mr. Kemp is the same.” Price \$1.25.

MAHAN'S CIVIL ENGINEERING.—The sixth edition of this able work, by D. H. Mahan, A. M., Professor of Civil and Military Engineering at West Point, is just issued by John Wiley, along with Smees' work; there are a large addenda and many new cuts in this edition. This work is well known, its character has long since been established. This new edition requires but to be noticed by us. The price is \$3.

AMERICAN ENGINEERING.—This is a new work, Part I. of which is before us, edited by Frederick Mone, C. E., and published by H. S. Samuels, No. 8 Park Place, this city; it contains two very large and detailed drawings of the engine of the North River crack steamboat “Reindeer,” which was built at the Morgan Works, by A. Guion, Engineer. We are glad to see such a work as this coming from the American press. Every young mechanic should subscribe for it for a certainty, and no American engineer should be without it. Each part costs \$1; it is accompanied with letter press explanation. The engravings are very large and well executed.

TALES AND TRADITIONS OF HUNGARY.—J. S. Redfield, Clinton Hall, has placed upon our table a book of 350 pages, bearing the above title, from the pen of Madame Pulszky, one of the Hungarian refugees, who is now travelling in the South and West, accompanying her husband, Count Pulszky, and the renowned Kossuth. The stories related in this book are written in a pleasing style, and we predict for it an extensive sale. Price \$1.25.

ISA, A PILGRIMAGE.—By Caroline Chesbro: Redfield has also just published another gem from the pen of Miss Chesbro, authoress of “Dream Land by Daylight,” noticed by us a few weeks ago.

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N. B.—The public are particularly warned against paying money to Travelling Agents, as none are accredited from this office. The only safe way to obtain a paper is to remit to the publishers.