UTILIZATION OF THE WASTE OF CITIES.

This has become a very trite subject, for in so far as our city is concerned, it ever and anon comes up for discussion in our newspapers and magazines, and yet the problem, what to do with our city waste, is not yet answered. That much apparently valuable matter in the shape of street sweepings, sewage, garbage, and ashes goes to waste, and at the same time imposes an enormous cost upon the city for its removal, is apparent to all tax payers. How to get rid of it without involving such a cost, and, if possible, to realize some pecuniary profit from it, is the problem we so frequently hear discussed without any available results arising from the discussion. There are various reasons for this. Too often the subject is approached by men who, seeing the immense quantity of fertilizing material going to waste in a city of a million inhabitants, wonder why the farmers and gardeners in our immediate vicinity do not clamor to get it, and compete for it to such an extent as to make it a source of revenue to the city. These gentlemen who know far more about law, banking, and selling goods than they do about agriculture, abuse the city authorities for expending large sums of money in throwing it away instead of making a profit from it. The authorities are indeed as ignorant as themselves on agricultural matters, but having to get rid of it, they take the, to them, shortest and easiest course of carrying much of it to sea and throwing it overboard, to assist in making bars and similar impediments to a safe approach to our harbor, or in rendering our beaches filthy and malarious. Now we do not propose to solve the problem we have approached, but only to offer some suggestions and data that may assist in its solution, and turn the attention of those who have given it some consideration to other means of attaining the ends they have in view.

In the first and most important place, the whole subject becomes one of merely pecuniary consideration as to values, the same as any other article of merchandise.

The question then arises: Is the material worth to the farmer or gardener the cost of collecting, handling, and transportation? Now, the farmers and gardeners in the vicinity of our large cities are as intelligent and shrewd business men in their line as are our city residents in buying and selling merchandise. They quickly invest $10 or $15 in a barrelful of some new variety of potato, if they are assured that it is really earlier or a better late keeper than any other they know of. Four to fifteen dollars a pound for the right kind of cabbage seed for their purposes they do not begrudge; and a dollar or two an ounce for tomato or cauliflower seed is a mere bagatelle, so that it be just what they want. They try and use the best manures, thinking nothing of spending $50 to $100 per acre every year on their crops, knowing well that without the expenditure of capital in crude material and labor they cannot carry on their business, and especially when they have to compete with distant sections which steam navigation and railroads have almost brought adjoining us. As in every other business, a dollar saved is a dollar gained; so with these men, they look keenly to every saving. If, therefore, these men could save money by using the city's waste they would most assuredly do so. But they do not use it, simply because it is not worth the money it costs to get it, on account of its small fertilizing power and its great bulk as compared with other manures. Great stress has been laid upon the manurial value of the

STREET SWEEPINGS.

Let us see of what they are composed. Mainly of horse droppings, it will be said. By no means so; two-thirds of it is sand, and the one-third left has been ground into fine powder by the wheels of the vehicles, and its fertilizing qualities largely dried out of it by the sun or wind, or washed out of it by the rain or snow. A large quantity of the sand works up through the interstices of the paving blocks; in every repair to a street the sand is spread over it, and when swept up it is put with the better sweepings from other streets; it is so when gas or water pipes are laid, or when houses are built or repairing; the *débris* goes with the sweepings, overloading it with material which is of no earthly use to the farmer, and for which he must pay for the handling and transportation. If laws were passed and strictly enforced requiring builders and those who upturn the pavements to remove the *debris* as fast as it accumulates, and every street was swept every day or two, the horse droppings would have some manurial value and be worth paying for. But another element comes in which would deteriorate their value for some soils; and that is, the great amount of iron in them, produced by the constant attrition of the tires of the wheels of the vehicles and the shoes of the horses upon the stone pavement. It is something astonishing, the quantity of iron that can be got out by a magnet from a pound or two of dry sweepings taken from a much traveled street.

THE GARBAGE

of the city consists of vegetable matter, such as the refuse of the fruit and vegetables used, tea leaves, coffee grounds, and such like, with a large percentage of bones. It has been proposed to burn all this and use the ashes as manure. But this, so far as tried, has not been a success, because of the cost, as necessarily all the water must be dried out of it before it can be burned to ashes. If it were partially dried by passing superheated steam through it, and so also be partially cooked, it might be compressed into bales and so be readily and cheaply transported. Composted with animal manures it would become a very efficient manure. Here again the law would have to be strictly enforced, requiring the garbage to be kept in vessels unmixed with ashes or similar materials. Proper machinery could be constructed by which the bones could be taken out of it; these amount to a very large quantity daily in a city like this, and as every body knows, form, when grounod dissolved, one of the best manures known. Less the water, the green vegetable matter composing the garbage is a good manure, as it contains a much greater percentage of potash than does the woody trunks and branches of the trees from which we derive our principal supply of that article. It is to this that the efficiency of the practice of plowing under green crops for fertilizing purposes is principally due. The garbage of the city is of far more value than the street sweepings, and at the same time it is more troublesome to manage. Towing it out to sea and throwing it overboard is a most egregious act of ignorance and stupidity.

Suggestions as to the disposal of city sewage and ashes we reserve for a future article.

The Grand Canal de l'Est.

A complete history of the origin and construction of the great French canal from the Marne to the Rhine and the Canal de l'Est, is now published under the title of "Alimentation du Canal de la Marne au Rhin et du Canal de l'Est," by M. Alfred Picard. This canal was conceived by M. Frécot, and undertaken for the purpose of making good the oss of the Strasburg junction of the two canals from the Rhone and the Marne to the Rhine, by the secession of Alsace and Lorraine after the war of 1870. It provides a waterway within the limits of the new frontier between the North Sea and the Mediterranean. Commencing on the Meuse, near the Belgian frontier, a little below Ginet, it skirts Mezieres, Sedan, Commercy, Toul, and Nancy, passes near Epinal, and terminates at Port-sur-Saône, on the well known tributary of the Rhone. The total length is about 290 miles, and the estimated cost is a million francs. The section between the Meuse and the canal from the Marne to the Rhine has been constructed, and the whole work is expected to be finished in less than two years.

Use of the Salts of Vanadium in the Arts.

This paper, a compilation by the Swedish Vanadium Company, Aktie Bolaget Urda, of Stockholm, contains some important information on aniline blacks. For an aniline black which does not turn green, which requires no subsequent treatment liable to degrade the black and soil the whites, the following process is recommended:

Water, 5,500 grammes; white starch, 1,250 grammes; dark calcined starch, 420 grammes. Boil, and when cooled down to 50 add aniline oil (of d'Andiran and Wegelin, Mulhouse), 800 grammes; hydrochloric acid, 21° B., 800 grammes. When cold add further: sodium chlorate, 420 grammes; boiling water, 500 grammes. And, at the moment of using, add vanadic solution, 10 grammes per liter, 200 grammes. The goods are aged for two days, passed through bichromate solution at 5 grammes per liter at 70°, and soaped. Instead of adding to the aniline oil the above-mentioned proportion of hydrochloric acid, it is well to neutralize the aniline by adding the acid gradually, till a few drops of the liquid introduced into a very dilute solution of Paris violet (1 gramme per liter) turns the violet color to a greenish blue. The "vanadic solution" above mentioned is obtained by dissolving, *e. g.*, 10 grammes ammonium vanadiate in 40 grammes hydrochloric acid, slightly diluted, in a porcelain capsule at a gentle heat, and adding glycerine in small dose, keeping the liquid to a boil till its color passes to a deep green and all the particles are dissolved. The whole is then made up with water to 1 liter and preserved in a stoppered bottle.

Electric Light on a Buoy.

Rear Admiral Nichols has issued the following: "An automatic buoy, having a ten-inch whistle, and a glass globe for an electric light on the top, has been moored in thirteen fathoms of water, south half east from the Sandy Hook Lightship, and about three cables' distance from her. The inventor of this buoy claims that it will show an intermittent electric light, the generation being operated by the action of the waves. The Lighthouse Board has permitted this buoy (the private property of the inventor) to be placed where it is in order that its practical advantages, if any, may be tested, and that its operations may be observed and reported upon by the people on board the lightship. The Lighthouse Board is not responsible for it as an aid to navigation. Pilots and navigators are respectfully requested to send to this office the results of their observations on this buoy."

The general construction is understood to be as follows: By the motion of the buoy, due to its rise and fall on the waves, air is compressed within the buoy, which acts intermittently to drive an electric engine and also to sound a whistle. When the air reaches a certain degree of compression the engine rotates and the carbon in the globe brilliantly glows; at the same time the whistle sounds.

THE CAT AS A PEST DISTRIBUTER.—The domestic cat is again charged with spreading disease, this time by the physicians of a district in Sullivan county, this State, where small-pox is epidemic. In several cases the proof is pretty strong that house cats carried the pest, and owners of cats have been warned to keep them from roaming about.

The Castes and Trades of India.

On the 10th of February a lecture on Indian castes and trades was delivered at the London Institution by Professor Monier Williams, C.I.E. He said India had been described as a poor country on the verge of bankruptcy, whereas it was really a rich country, with a poor population. Its potential wealth was incalculable. Indian art was in an advanced state long before Europe had emerged from barbarism; but at present the want of capital and the dislike to machinery were fatal to successful competition with European artisans, though Indian workmen were content with far lower wages. The secret of the beauty of Indian art lay in delicacy of touch and manipulation. The hand was still the chief implement in India. No European machinery ought to supersede it, and Indian art ought never to abandon its own national traditions and pure taste for meretricious ideas derived from Europe.

The lecturer exhibited several exquisite specimens of Indian industrial skill, lent for the occasion by the South Kensington Museum, such as Dacca muslin, Kincob work, silver work, wooden carvings, pottery, and jewelry. Cotton cloth imported from Manchester was far inferior to that woven and decorated with patterns by man's hand in India, but was cheaper. Spinning and weaving mills had lately been erected at Bombay, but native artisans were organizing bands of minstrels who went about the bazaars singing songs ridiculing the vulgarity of taste displayed in European textile fabrics. The connection between trades and castes was then explained. Every caste originally had its fixed occupation, and many castes were merely trade-guilds. Some castes, however, had changed their occupations. All the low castes might be tillers of the soil; these constituted three-fourths of the whole population; the higher castes might engage in almost any industry. The Indian village system was the germ out of which the present castes and trades were developed. The various functionaries of an autonomous village community were then described. If any one offended against caste rules, he was "Boycotted." No one would buy from him or sell to him. "Boycotting" was a bad imitation of a custom practiced in India for centuries. Modern castes, trades, and industries, were innumerable. Some new ones reported in the recent census were rather strange—such as "professional speech-makers" and "professional givers of evidence." Indian art and industry ought not to be denationalized; the evil of caste should be neutralized by corrective influences rather than by government interference. Caste had its good side, which should be retained.

The Alphabet in Writing and Printing.

The proportionate use of letters, as given in Brewer's "Dictionary of Phrase and Fable," is as follows:

E,	1,000	H, 540	F, 236	K, 88
T,	770	R, 528	W, 190	J, 55
A,	728	D, 392	Y, 184	Q, 50
I,	704	L, 360	P, 168	X, 46
S,	680	U, 296	G, 168	Z, 22
O,	67[illegible]	C, 280	B, 158	
N,	670	M, 272	V, 120	

Consonants, 5,977; vowels, 3,400.

The proportion for initial letters is as follows:

S,	1,194	M, 439	W 272	Q, 58
C,	937	F, 388	G, 266	K, 47
P,	804	I, 377	U, 228	Y, 23
A,	574	E, 340	O, 206	Z, 18
T,	571	H, 308	V, 172	X, 4
D,	505	L, 298	N, 153	
B,	463	R, 291	J, 69	

Waste Paper.

A recent report of the controller of the British Stationery Office, whose function is to provide the paper used in all the government offices, states that the value of the waste paper collected from the various offices and sold for the public account averages $50,000 a year. Hitherto it has been the rule to turn the bulk of this paper over to a single firm, under bond to reduce it to pulp in the United Kingdom. Under such conditions, the price received was less than the paper was worth in open market. The paper is now sent to the state prisons, where it is sorted and torn up, so as to be rendered practically illegible, and then sold unconditionally at much better prices than before.

At first thought it might seem to be more economical to burn the paper at once, and thus save all the expense of collection and transportation; but the controller states that the money received for waste paper in some years amounts to more than the total salaries of the controller, assistant controller, and staffs of the department in both England and Ireland.

A New Snow Melter.

A Philadelphia engineer, Mr. Leonard Phleger, has had constructed a snow melting machine, described as a wagon with an iron body, surmounted by a smokestack. At the rear of the body, like a fire engine, is a firebox, the heat from which ascends to a space eight inches high, which extends the length and width of the body. Above this space is the snow box, which is two feet deep and fourteen and one-half feet long. The theory of the inventor is that the heat, which passes through the narrow space immediately beneath the box, will keep the floor of the box heated to such a degree that the snow will melt as fast as it can be thrown into it. On one side of the box is a line of holes three inches wide, through which the water from the melted snow will run into the street. The smokestack can be placed in either a horizontal or a perpendicular position. The entire apparatus is sixteen feet long and the body three feet deep. Unfortunately the snow thawed before the machine was ready for trial.