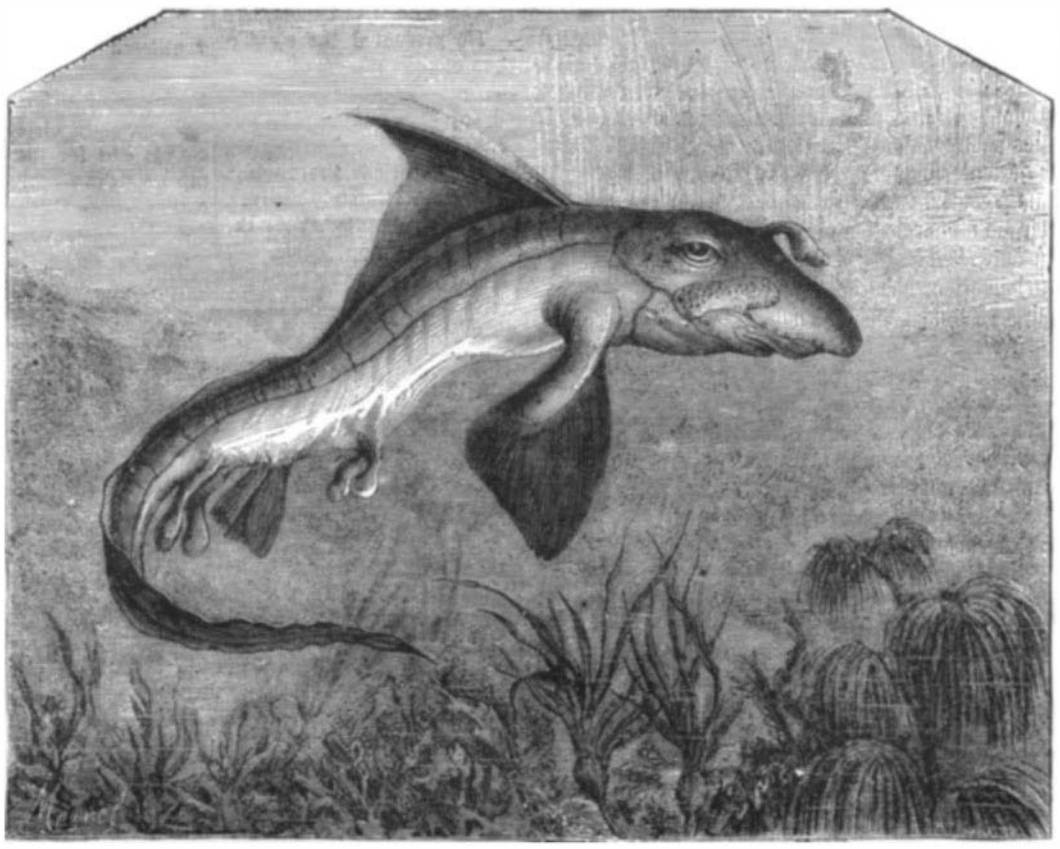
THE SEA CAT.

"Sea cat" is the popular name bestowed on certain cartilaginous fishes of the order *Holocephala* because of a peculiarity of their eyes, which have a greenish pupil, surrounded by a white iris, and which have the property of shining, especially at night, like the eyes of the cat. These fishes seem to form a group intermediate between sturgeons and sharks.

Nothing is stranger and more ugly in appearance than one of these fishes, especially the species represented in the engraving, and which is well deserving of its scientific name, *Chimæra monstrosa*. It is from three to four feet long, and its body, from the base of its enormous head, gradually diminishes in size and ends in a long slender tail like that of some reptile. Its skin is smooth, elastic, and flabby, of a silvery white, and covered with scales that are so minute that they are scarcely perceptible to the touch. It is thrown into folds and sinuous wrinkles all along the body and on the top of the head, so that it appears to be too large for the body that it envelops. Under the mouth, and on the lateral faces of the snout, it is perforated with numerous holes, from which issues a glutinous mucus. The pectoral fins are supported on a sort of thick fleshy arm. Before and behind the ventrals hang two appendages resembling small paws. Between the eyes there is a large fleshy club-shaped process, with serrated edge, and ending in a spine, which somewhat resembles a crown, and has given rise to one of the popular names of the fish—"king of the herrings." What makes the sea cat still more hideous is its quick and odd movements, bending and twisting, as it does, in all possible directions. Besides this, the different parts of its snout are constantly in motion, so that it has the appearance of making grimaces, which have been compared to those made by monkeys. There are two kinds of this fish—the northern sea cat (represented in the engraving) which is found in the North Sea and Northern Atlantic, and the southern sea cat (*Callorhyncus australis*), inhabiting the southern seas. The first of these pursues shoals of herrings and other migratory fish, and also feeds on jelly fishes and crustaceans. Its flesh is tough, but the Norwegians use the eggs (which, as in the sharks, are inclosed in a leathery capsule) as food, and employ the oil of the liver in diseases of the eyes and for wounds.

In the southern sea cat the snout ends in a gristly appendage, bent backward at the end so as to resemble a hoe; the anterior dorsal is very far forward over the pectorals; the second over the ventrals and reaching to the caudal, and the tail does not end in a filament. The singular shape of its snout, which is not unlike that of the tapir, has gained for it the familiar name of "elephant fish." It is about the same size as the northern animal, and is silvery, tinged with yellowish brown.

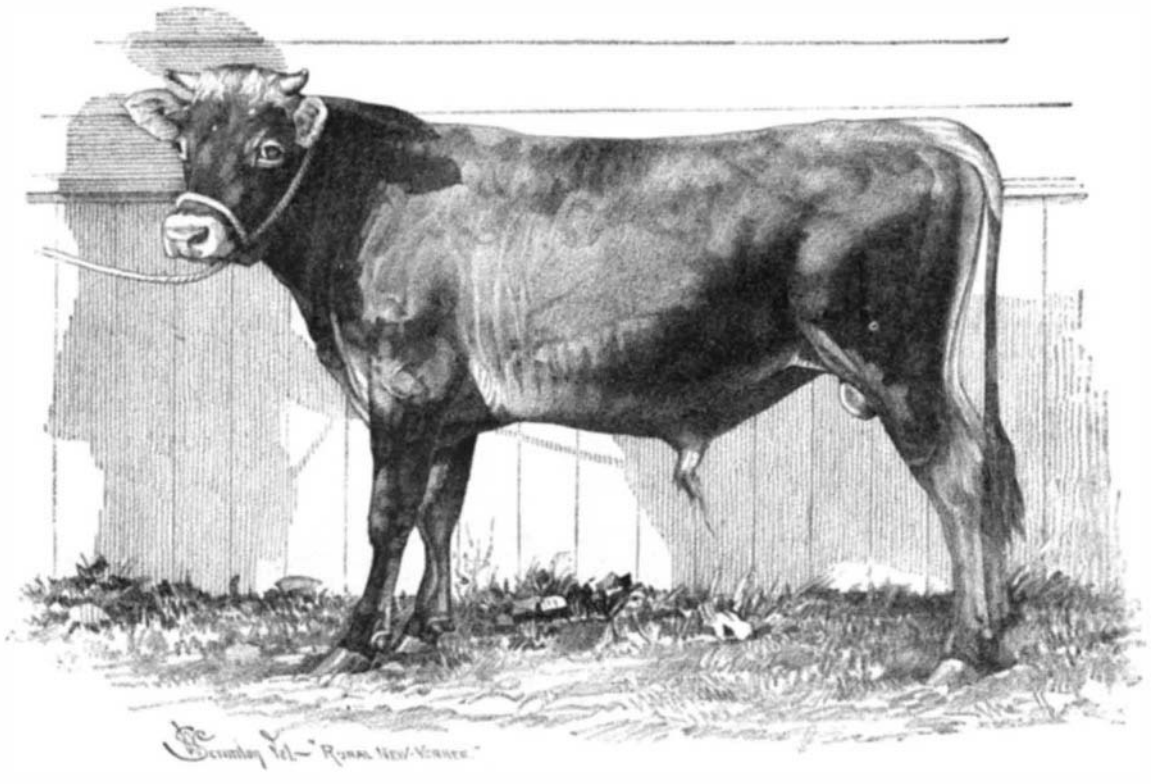


THE SEA CAT

JERSEY BULL DIAVOLO.

This bull was the first prize in the yearling class at the New York State Fair in 1880. It is the property of Hon. Erastus Corning, of Albany.

The engraving, from a photograph taken for the *Rural New Yorker*, at the time of the Fair, and reproduced with great faithfulness, is a very correct portrait of this spirited and beautiful animal. That he is "good enough" goes without saying, for he won the highest honor in a large class. The photograph, as usual, slightly exaggerates the legs, perhaps, but the life-like play of light on the hide, the shadows, the spirited pose of the animal, are excellent, and so well preserved that the picture is a source of pleasure simply as a work of art. Diavolo was sired by Stockwell 3d, the noble bull which won the first prize at the same show in "aged" class, and was imported by Mr. Corning. His dam, Tranquillity, is by the same sire, her dam being Daisy Morton, also imported.



JERSEY BULL DIAVOLO.

Black Sheep of Australia.

Mr. Charles Darwin communicates to *Nature* the following extract of a letter from a Mr. Sanderson, of Chilhurst, which seems to explain the reason for raising and scattering black sheep among flocks of white ones on ranches in Australia. Mr. Sanderson writes: "In the early days, before fences were erected and when shepherds had charge of very large flocks (occasionally 4,000 or 5,000), it was important to have a few sheep easily noticed among the rest; and hence the value of a certain number of black, or partly black sheep, so that colored lambs were then carefully preserved. It was easy to count ten or a dozen such sheep in a flock, and when one was missing it was pretty safe to conclude that a good many had strayed with it, so that the shepherd really kept count of his flock by counting his speckled sheep. As fences were erected the flocks were made smaller, and the necessity for having these spotted sheep passed away. Their wool also being of small value, the practice soon grew of killing them off as lambs, or so young that they had small chance of breeding, and it surprised me how, at the end of my sheep farming experience of about eight years, the percentage of colored lambs produced was so much smaller than at the beginning. As the quantity of colored wool from Australia seems to have much diminished, the above experience would appear to be general."

Filtration and Decolorization.

BY C. G. PFANDER, LONDON.

It consists of dried or baked granulated clay mixed with blood to the proportion of about three of clay to four of blood; sometimes a proportion of vegetable charcoal is added. This mixture is moulded into lumps of convenient form, dried, broken into small pieces, mixed with an equal bulk of granulated clay, and then carbonized in a retort. This material, when screened, constitutes the new filtering material especially adapted for treating sugar, etc. The dust screenings will remove color from solutions of sugar and form a new product.

NATURAL HISTORY NOTES.

The Colors of Flowers.—Hitherto it has been supposed that the colors of flowers were due to so many different materials, each color being a chemical combination having no relation with the others. But now, however, Prof. Schuetzler, in a communication to the Vaudois Society of Natural Sciences, shows that, when the color of a flower is extracted by placing the latter in alcohol, the addition of an acid or alkali will give all the colors that plants exhibit. Flowers of pæony, for example, give when put into alcohol a violet-red liquid. If to this solution binoxalate of potassa ("salt of sorrel") be added the color becomes pure red. Soda causes it to change, according to quantity used, to violet, blue, or green. In the latter case the green liquid appears red by transmitted light, just as a solution of chlorophyl (the green coloring matter of leaves) does. The sepals of pæony, which are green bordered with red, become entirely red when put into a solution of binoxalate of potassa. These changes of color, which may be obtained at will, may well be produced in plants by the same causes, since in all plants there are always acid or alkaline matters. Moreover, it is quite certain that the change from green to red observed in leaves in autumn is due to the action of the tannin which they contain on the chlorophyl. Consequently, without wishing to affirm it absolutely, Prof. Schuetzler believes that *a priori* there is in all plants but one coloring matter—chlorophyl—which, becoming modified by certain agents, gives all the tints that flowers and leaves exhibit. As for white flowers, it is well known that their want of color is due to the fact that their cells are filled with a colorless fluid, and that their opacity proceeds from the air contained in the interspaces.

When such flowers are placed under the receiver of an air-pump they are seen to lose their opacity and become transparent in measure as the air is exhausted.

Relation of Fish to the Lime in Water.—In a recent paper by Herr Weith, entitled "Chemical Investigation of Swiss Waters with Reference to their Fauna," he gives a large number of quantitative analyses of the water of Swiss lakes, rivers, and streams, with regard to the proportion of lime and earthy substances generally contained in them. In this research a very interesting relation appeared between the quantity of fish and the amount of lime contained in the water. The result arrived at was that, in general, of the various bodies of water under otherwise similar conditions, those which contain the most *dissolved carbonate of lime* also contain the most fish. The explanation of this fact is also given by the author. The simple carbonate of lime is found largely distributed on the bottom and banks of lakes, etc., but it is insoluble, and therefore cannot be taken up by the water. If, however, the water contains carbonic acid in abundance (which of course is produced by the respiration of animals) this transforms the carbonate into the bicarbonate, which is readily soluble in water. The correctness of this view was proved by the author by experiment. By a sure chemical analysis, then, one may with considerable probability form a prognosis as to the quantity of fish in a body of water, to say what its chemical composition was, and to find his estimate remarkably verified. An important practical consequence would be deducible from these facts, if further experiments should confirm the supposition that not only do

fishes increase the proportion of lime in water, but that, conversely, an abundance of lime in water might have a stimulating effect on fishes. The latter, for their part, produce this carbonic acid which, with lime present in the water, does not escape into the atmosphere, but remains dissolved in water, and so stimulates plant life. Water plants, however, serve aquatic animals as food, and render possible their existence; and thus vegetable and animal life, whose mutual dependence is well known, is maintained by the mediating action of lime in continuous and intimate connection. Experiments on a large scale would decide whether it is possible to transform a body of water on ground which is without lime, and therefore poor in organic life, by suitable addition of carbonate of lime into such as would afford proper condition of life for animals and plants.

Effect of Strong Drink on the Liver.

The *Family Physician* tells us that when alcohol is introduced into the stomach in the ordinary way, it nearly all passes through the liver. Undiluted spirits are much more injurious than when mixed with water, and produce greater irritation. Alcohol consumed as wine or beer is far less destructive to the liver than when taken in the form of ardent spirits. A hot climate intensifies all the vicious effects of alcohol. The symptoms of cirrhosis of the liver are in the early stages often obscure, but later they are sufficiently well marked. At first the liver gets slightly enlarged, and the patient suffers from pain in the right side, indigestion, wind, and costive bowels. He is occasionally feverish, his skin is hot and dry, and he has a peculiar, unhealthy, sallow look, which he probably fails to notice, but which is sufficiently obvious to his friends. The necessity for making a change in his habits is forced upon his attention, and for a week or two he is under the doctor's orders, and not feeling able to drink any more, he consents to follow a restricted diet, and to take a course of purgatives.

Soon the most prominent symptoms are relieved, he fancies himself well again, and quickly returns to his old habits. Gradually, however, he notices that he is getting thinner and weaker, and occasionally he has a good deal of pain in the side. He is nervous and out of sorts. He has no longer the pluck he used to have; first his friends notice it, and then he gradually becomes aware of it himself. He finds that he is not "fit for business," and he is afraid to see people. The patient has occasional attacks of diarrhea, his appetite fails, and the emaciation and debility increase. He tries all kinds of treatment, but never sticks to one for long at a time. He consults every one of any note in London, but derives little if any benefit from their advice. He would give up the drink if he could, but he can't. His self-reliance is gone, the alcohol has stolen away his will, and he is utterly incapable of giving up the dangerous fascination. He will take an oath to-day that he will never touch another drop of spirit, and will probably break it to-morrow. Sometimes he wishes that some one would lock him up in an asylum, or that by some chance or other he could have six months' imprisonment, but he never feels able to put himself under restraint. After a time the liver gets smaller, and this, instead of being a good sign, is a bad one, for it is contracting. He would willingly enough consent to knock off drink now, but it is too late; the mischief is done, the liver is in a state of cirrhosis, and no medicine can restore it to its natural condition. Is there any remedy for this horrible complaint? Yes, one, teetotalism—absolute abstinence from alcoholic liquors of all kinds. This remedy must be applied early. If he waits till his liver has undergone serious organic change, it is too late. No half measures will suffice; he must give up drink of all kinds. If he does this he will recover; but if he goes on in his old plan an early and painful death is the inevitable consequence.

Exercise and Temperature.

These have been made the subject of a series of observations (about 150 in number, extending over four years) by M. Bonnal. He finds that all muscular exercise raises the rectal temperature. The rise is not, however, in direct relation either to the duration of the exercise or the apparent fatigue. For a given exercise, performed under like conditions, the rise of temperature may vary in different individuals, and even in the same individual. The altitude, the state of the atmosphere, the energy of the movement, the nature and amount of clothing, have a very manifest influence, especially on the rapidity of the rise. Absence or abundance of perspiration has no appreciable influence. The rectal temperature is rarely elevated beyond 38·6° C.; but in one case, that of a runner who, on the 14th of November, ran about 18 kilometers in an hour and a half without stopping, M. Bonnal found it 39·5°. (This man showed no accelerated respiration, but merely an increase of pulse to 145 beats.) In rest after exercise the rectal temperature falls, and the more rapidly the shorter the exercise has been. It is noted that all rapid exercise diminishes the peripheric temperature (in the mouth, armpit, or groin), which, on the other hand, rises again directly rest is taken, and after some time the peripheric and rectal temperatures come to their normal difference, 0·2° or 0·3°. If the rectal temperature be over 37°, a moderate exercise (such as walking 20 minutes on level ground) only raises it 0·2° to 0·4°.; but if under 37°, the rise may be more. In rapid ascent it is always after the first half hour that the rectal temperature is most raised; it may then remain stationary, or rise, or even descend a few tenths of a degree. Gymnastic exercise in the horizontal position, and limited to the upper limbs, does not alter the initial temperature. If limited to the lower limbs, it may, in 30 minutes, raise the rectal temperature 0·3° to 0·7°. In general, a rigorous application of the laws of mechanics to the human organism is not justified.

Accumulation of Foreign Bodies in the Stomach.

The following case is reported by Charles L. Dayton, M.D., in the Buffalo *Medical and Surgical Journal*. It demonstrates that in gastric diseases there is great difficulty in forming a correct diagnosis, and also in reaching a reliable prognosis, the problem only yielding a satisfactory solution through a *post-mortem* examination:

Mr. S., aged 45, residing at Black Rock, for a period of six months had complained of gastric pain with nausea, and other symptoms of indigestion. He presented the appearance of one suffering from scirrhus of the stomach or aggravated dyspepsia. Failing to secure relief after consulting several physicians, he consented to accompany me, with a view to consult Prof. Austin Flint, Sr., at that time residing in Buffalo. Prof. Flint examined the patient thoroughly, and expressed the opinion that he would ultimately recover. Two days afterward the patient suddenly died. At the autopsy, in the presence of Drs. L. P. Dayton, Tobie, and Beaman, the stomach was removed. It contained a tumblerful of prune pits; the pyloric orifice was so far occluded by the induration of the surrounding tissues that it admitted only the passage of a small catheter. About three inches from the pyloric orifice the stomach was perforated, probably through the influence of the prunes. His wife stated that he had not eaten prunes in five or six months, and could offer no explanation for his swallowing the pits.

The case is interesting on account of the presence of so large a quantity of foreign substances in the stomach, of the similarity of symptoms to those usually occurring in ulceration and scirrhus, and of the obscurity often attending gastric and intestinal disease, which is cleared up only through the *post-mortem* examination.

Neuralgia as a "Warning."

The great prevalence of "neuralgia"—or what commonly goes by that name—should be regarded as a warning indicative of a low condition of health, which must necessarily render those who are affected with this painful malady especially susceptible to the invasion of diseases of an aggressive type. This is the season at which it is particularly desirable to be strong and well furnished with the sort of strength that affords a natural protection against disease. There will presently be need of all the internal heat which the organism can command, and a good store of fat for use as fuel is not to be despised. It is no less essential that the vital forces should be vigorous, and the nerve power, especially, in full development. Neuralgia indicates a low or depressed state of vitality, and nothing so rapidly exhausts the system as pain that prevents sleep and agonizes both body and mind. It is, therefore, of the first moment that attacks of this affection, incidental to and indicative of a poor and weak state, should be promptly placed under treatment, and as rapidly as may be controlled. It is worth while to note this fact, because, while the spirit of manliness incites the "strong-minded" to patient endurance of suffering, it is not wise to suffer the distress caused by this malady, as many are now suffering it, without seeking relief, forgetful of the condition it bespeaks, and the constitutional danger of which it is a warning sign.—*Lancet.*

Suggestions Concerning Long Life.

If any one could furnish the world with a medicine which would insure a long life, there is no end to the demand he would have for his drug. The *Herald of Health* thinks he would need many factories to make it, and many banks to hold the money he would receive. Fortunately there is no such medicine, and so the world will have to get along in some other way.

Some time ago the French Government sent a circular letter to all the districts of that country to collect information as to those conditions of life which seemed to favor longevity. The replies were very interesting, but on the whole rather monotonous; and the general result was that longevity is promoted by great sobriety, regular labor, especially in the open air, short of excessive fatigue, easy hours, a well-off condition, a philosophical mind in meeting troubles, not too much intellect, and a domestic life. The value of marriage was universally admitted, and long-lived parents were also found an important factor. A healthy climate and good water were mentioned. All this agrees with common sense, unless the idea that the intellect is a hinderance to longevity be considered unreasonable, and we know that some of the most intellectual men have lived to great age.

Soda for Burns.

All kinds of burns, including scalds and sunburns, are almost immediately relieved by the application of a solution of soda to the burnt surface. It must be remembered that *dry* soda will not do unless it is surrounded with a cloth moist enough to dissolve it. This method of sprinkling it on and covering it with a wet cloth is often the very best. But it is sufficient to wash the wound repeatedly with a strong solution. It would be well to keep a bottle of it always on hand, made so strong that more or less settles on the bottom. This is what is called a saturated solution, and really such a solution as this is formed when the dry soda is sprinkled on and covered with a moistened cloth. It is thought by some that the pain of a burn is caused by the hardening of the albumen of the flesh which presses on the nerves, and that the soda dissolves the albumen and relieves the pressure. Others think that the burn generates an acrid acid, which the soda neutralizes.

Sewage, and Rules for Public Buildings.

The following rules, to be observed in the construction of all buildings erected under her Majesty's Office of Works, have been prepared and issued by the Secretary to the Office of Works:

1. All water closets and urinals shall be constructed so that one wall at least of such closets and urinals shall be an outer wall of the building.

2. All soil pipes shall be carried outside the building, and ventilated by means of pipes leading the foul gases above the highest point of the building. Such pipes to be carried to points removed from chimney stacks.

3. Separate cisterns shall be constructed for the water closets and for the general purposes of the building. No tap or "draw-off" shall be affixed to any pipe communicating with a cistern supplying a water closet or urinal.

4. All waste pipes and overflow pipes of cisterns shall terminate in the open air, and be cut off from all direct communication with drains.

5. Great attention shall be paid to insuring thorough ventilation in all rooms. Rooms so high that their ceilings shall be more than two feet above the top of the windows, corridors, staircases, and other open spaces, shall be specially ventilated so as to prevent the accumulation of stagnant air.

6. All main drains should, where practicable, be formed outside the building. In the event of its being necessary to carry a main drain underneath a building, it must be trapped immediately outside the main wal , and a ventilating-pipe must be carried from that point to the highest part of the roof, as under Rule 2.—*Journal of the Society of Arts.*

Pilocarpin in Diphtheria.

Last week fifty-two children died in Brooklyn of diphtheria. Sad reports of similar mortality come from other quarters. I is our duty to call he especial attention of American physicians to the extrao dinary success which is now reported in Germany, in this disease, from the *muriate of pilocarpin*. It is given in ordinary doses, internally, and a large number of cases have been reported by different physicians wherein the results were astonishingly good. As soon as the pilocarpin exercises its specific effect on the salivary glands, the false membrane detaches, the inflammatory phenomena disappear, and improvement begins.

We particularly request our readers to try this treatment and report their results, whether good or bad.—*Medical and Surgical Reporter.*

Raspberry Culture Made Easy.

It is a source of constant regret with farmers that small fruits require so much care and attention, and that, too, in the season when they are hardest at work at something else. Field work must be done at all events, and so the "berry patch" struggles on single-handed with weeds and grass till it submits to the inevitable sward. Some years ago, coming into possession of a patch of black-cap raspberries that had received the usual shiftless culture, I treated them in the following way: After carefully plowing and hoeing them, I covered the ground with a heavy layer of strawy manure, and the work was done, no only for that year, but for the two years following, only renewing the mulch each spring. Only a few straggling Canada thistles will ever grow through such a mulch; the soil is always rich and moist, and the berries can ask no better treatment. Since that time I have tried the same plan without removing the sod, and find that the result is quite as satisfactory. Late as it is in the season now, any raspberry plot can be reclaimed by a liberal application from the horse manure pile. Farmers, try it, and you will not need to complain that berries cost more than they are worth.—*J. C. in N. Y. Tribune.*

Sewer Ventilation.

At a recent meeting of the Leith Town Council, Provost Henderson, *a propos* a memorial from certain inhabitants on nuisance said to be caused by the sewer ventilation in the streets, took occasion to address the Council on the principles and practice of sewer ventilation. He described the various means which had been resorted to in different towns to secure ventilation of the sewers, by in-draughts, by out-draughts, by furnaces, by screws, but thought experience had proved that the simpler the means adopted the more effectual the result. In fact, the more numerous and more direct the openings made in the sewers the better the ventilation and the less the nuisance (if any) from sewer air. He, as Mrs. Lirriper with the chimney-cowls and smoke, preferred the ventilation, and the means thereof, *plain*, and this was the general conclusion of competent observers on the subject. If the street ventilators of Leith stink, the evil must be sought not in the ventilators, but in the sewers themselves.

PASTE FOR PAPER.—To ten parts by weight of gum arabic add three parts of sugar in order to prevent the gum from cracking; then add water until the desired consistency is obtained. If a very strong paste is required add a quantity of flour equal in weight to the gum, without boiling the mixture. The paste improves in strength when it begins to ferment.—*Chron. Industr.*

Cotton Manufacture.—Census of 1880.

Preliminary report upon the *specific* cotton manufacture of the United States, exhibiting the number of looms, spindles, the number of bales of cotton consumed, and the number of operatives employed, as reported by Edward Atkinson, of Boston, Mass., Special Agent of the Tenth Census on Cotton Manufacture.

STATES.	Number of Looms.	Number of Spindles.	Number Bales of Cotton Used.	Persons employed, including Agents, Overseers, Clerks, Mechanics, Watchmen, and Operatives.
The United States...	230,223	10,921,147	1,586,481	181,628
Alabama	1,060	55,072	14,887	1,600
Arkansas	28	2,015	720	64
Connecticut	18,036	931,538	107,877	15,497
Delaware	823	48,858	7,512	695
Florida	—	816	350	33
Georgia	4,713	200.974	67,874	6,678
Illinois	24	4.860	2,261	281
Indiana	776	33,396	11,558	720
Kentucky	73	9,022	4,215	359
Louisiana	120	6.096	1,354	108
Maine	15978	696,655	112,361	11,318
Maryland	2,325	125,014	46,947	4,159
Massachusetts	94,788	4,465,290	578,590	62,794
Michigan	131	12.120	600	208
Mississippi	704	26,172	6.411	748
Missouri	341	19.312	6,399	515
New Hampshire	25,487	1,008,521	172,746	16,657
New Jersey	3,344	232,305	20 569	4,658
New York	12,822	578.512	70,014	10,710
North Carolina	1,960	102,767	27,508	3,428
Ohio	42	14,328	10,597	563
Pennsylvania	10,541	446,379	86,355	11,871
Rhode Island	80,274	1,649,295	161,694	22 228
South Carolina	1,776	92.788	33,099	2,195
Tennessee	1,068	46.268	11,699	1,312
Texas	71	2,648	246	71
Utah	14	432	—	29
Vermont	1,180	55,088	7.404	735
Virginia	1,324	44,336	11,461	1,112
Wisconsin	400	10,240	3,173	282

The Health of Cities.

Statistics compiled by the National Board of Health show that for the year ending October 31, 1880, the more important cities of the world rank as follows in comparative healthfulness. The death rate shows the number of deaths to each 1,000 persons during the year:

City.	Population.	Death Rate.
Chicago	503.298	17·9
Philadelphia	850,000	18·3
St. Louis	333,577	18·8
Boston	375,000	20
Baltimore	393.796	20·9
London	3,254,260	21
Leeds	318,291	21·8
Glasgow	589,598	21·9
New York	1,203,223	23·4
Paris	1,988,806	24
Brooklyn	556,889	25·8
New Orleans	216 359	27·7
Lyons	342,815	27·7
Berlin	1,096,644	29·3
Dublin	314,666	32·9

Luminous Paint.

According to the London *Building News*, luminous paint is getting into quite extensive use in England. Mention is made of offices coated with the paint which give great satisfaction to the occupants. The effect is that of a subdued light, every object in the room being clearly visible, so that in a room so treated one could enter without a light, and find any desired article. The luminous paint is excited by the ordinary daylight, and its effect is said to continue for about thirteen hours, so that it is well adapted for painting bedroom ceilings, passages that are dark at night, and other places where lamps are objectionable or considered necessary. For staircases and passages a mere band of the paint will serve as a guide, and costs but a trifle. For outdoor purposes the oil paint is used, but for ceilings and walls the luminous paint, mixed with water and special size, can be used the same as ordinary whitewash, and presents a similar appearance in the daylight. By the recent discovery that it can be applied as ordinary whitewash considerably expands the field of its usefulness. Sheets of glass coated with the paint are in use in some of the vessels of the navy, at the Waltham Powder Factory, at Young's paraffine works, and in the spirit vaults of several London docks; and now that, by increased production and the use of water as the medium, its cost is reduced by one half, it will probably be extensively used for painting walls and ceilings. The ordinary form of oil paint has already been applied in many ways, to statues and busts, to toys, to clock faces, to name plates and numbers on house doors, and to notice boards, such as "mind the step," "to let," etc. The paint emits light without combustion, and therefore does not vitiate the atmosphere. Several experimental carriages are now running on different railways, the paint being used instead of lamps, which are necessary all day on account of the line passing through occasional tunnels.

Light Road Locomotive Wanted.

A correspondent suggests that this is one of the great needs of the times, and wants us to keep the subject before our readers. He says: "Your suggestions in years past have brought out many valuable inventions. Having been a patron of the SCIENTIFIC AMERICAN for thirty years I know its value. It has been a schoolhouse, workshop, and laboratory to thousands of men who are now in mature life."

Cities Having a Population of 10,000 and Over.—Census of 1880.

State.	Pop.	State.	Pop.
Akron, O	16,512	Malden, Mass	12,017
Albany, N. Y	90,903	Manchester, N. H	32,630
Alexandria, Va	13,658	Marlborough, Mass	10,126
Allegheny, Pa	78,681	Memphis, Tenn	33,593
Allentown, Pa	18,063	Meriden, Conn	18,340
Altoona, Pa	19,716	Middletown, Conn	11,731
Amsterdam, N. Y	11,712	Milwaukee, Wis	115,578
Atchison, Kan	15,100	Minneapolis, Minn	46,887
Atlanta, Ga	34,398	Mobile, Ala	31,205
Attlehorough, Mass	11,111	Montgomery, Ala	16,714
Auburn, N.Y	21,924	Muskegon, Mich	11,262
Augusta, Ga	23,023	Nashua, N. H	13,397
Aurora, Ill	11,825	Nashville, Tenn	43,461
Austin, Texas	10,960	Newark, N. J	136,400
Baltimore, Md	332,190	New Albany, Ind	16,422
Bangor, Me	16,857	New Bedford, Mass	26,875
Bay City, Mich	20,693	New Britain, Conn	13,978
Belleville, Ill	10,682	New Brunswick, N. J	17,167
Biddeford, Me	12,652	Newburg, N. Y	18,050
Binghamton, N. Y	17,315	Newburyport, Mass	13,537
Bloomington, Ill	17,184	New Haven, Conn	62,882
Boston, Mass	362,535	New London, Conn	10,529
Bridgeport, Conn	29,148	New Lots, N. Y	13,681
Brockton, Mass	13,608	New Orleans, La	216,140
Brookhaven, N. Y	11,541	Newport, Ky	20,433
Brooklyn, N. Y	566,689	Newport, R. I	15,693
Buffalo, N. Y	155,137	Newton, Mass	16,995
Burlington, Iowa	19,450	New York, N. Y	1,206,590
Burlington, Vt	11,364	Norfolk, Va	21,966
Cambridge, Mass	52,740	Norristown, Pa	13,064
Camden, N. J	41,658	North Adanis, Mass	10,192
Canton, O	12,258	Northampton, Mass	12.172
Castleton, N. Y	12,679	Norwalk, Conn	13,956
Cedar Rapids, Iowa	10,104	Norwich, Conn	21,141
Charleston, S. C	49,939	Oakland, Cal	34,556
Chattanooga, Tenn	12,892	Ogdensburg, N. Y	10,340
Chelsea, Mass	21,785	Omaha, Neb	30,518
Chester, Pa	14,996	Orange, N. J	13,206
Chicago, Ill	503,304	Oshkosh, Wis	15,749
Chicopee, Mass	11,325	Oswego, N. Y	21,117
Chilicothe, O	10,938	Oyster Bay, N. Y	11,923
Cincinnati, O	255,708	Paterson, N. J	50,887
Cleveland, O	160,142	Pawtucket, R. I	19,030
Cohoes, N. Y	19,417	Peoria, Ill	29,315
Columbia, S. C	10,040	Petersburg, Va	21,656
Columbus, O	51,665	Philadelphia, Pa	846,984
Concord, N. H	13,838	Pittsburg, Pa	156,381
Cortlandt, N. Y	12,664	Pittsfield, Mass	13,367
Council Bluffs, Iowa	18,059	Portland, Me	33,810
Covington, Ky	29,720	Portsmouth, O	11,314
Dallas, Texas	10,358	Portsmouth, Va	11,388
Danbury, Conn	11,669	Pottsville, Pa	13,253
Davenport, Iowa	21,834	Poughkeepsie, N. Y	20,207
Dayton, O	38,677	Providence, R. I	104,850
Denver, Col	35,630	Quincy, Ill	27,275
Derby, Conn	11,649	Quincy, Mass	10,529
Des Moines, Iowa	22,408	Racine, Wis	16,031
Detroit, Mich	116,342	Reading, Pa	43,280
Dover, N. H	11,687	Richmond, Ind	12,743
Dubuque, Iowa	22,254	Richmond, Va	63,803
Easton, Pa	11,924	Rochester, N. Y	89,363
East Saginaw, Mich	19,016	Rockford, Ill	13,136
Eau Claire, Wis	10,118	Rock Island, Ill	11,660
Elmira, N. Y	20,541	Rome, N. Y	12,045
Elizabeth, N. J	28,229	Rutland, Vt	12,149
Erie, Pa	27,730	Sacramento, Cal	21,420
Evansville, Ind	29,280	Saginaw, Mich	10,525
Fall River, Mass	49,006	Salem, Mass	27,598
Fishkill, N. Y	10,732	Salt Lake City, Utah	20,768
Fitchburg, Mass	12,405	San Antonio, Texas	20,561
Flushing, N. Y	15,919	Sandusky, O	15,838
Fond-du Lac, Wis	13,091	San Francisco, Cal	233,956
Fort Wayne, Ind	26,880	San Jose, Cal	12,567
Galesburg, Ill	11,446	Saratoga Springs, N. Y	10,832
Galveston, Texas	22,253	Saugerties, N. Y	10,375
Georgetown, D. C	12,578	Savannah, Ga	30,681
Gloucester, Mass	19,329	Schenectady, N. Y	13,675
Grand Rapids, Mich	32,015	Scranton, Pa	45,850
Hamilton, O	12,122	Shenandoah, Pa	10,148
Hannibal, Mo	11,071	Shreveport, La	11,017
Hartford, Conn	42,553	Somerville, Mass	24,985
Harrisburg, Pa	30,762	South Bend, Ind	13,279
Haverhill, Mass	18,475	Springfield, Ill	19,746
Hempstead, N. Y	18,160	Springfield, Mass	33,340
Hoboken, N. J	30,999	Springfield, O	20,729
Holyoke, Mass	21,851	Stamford, Conn	11,298
Houston, Texas	18,646	Steubenville, O	12,093
Hyde Park, Ill	15,716	Stockton, Cal	10,287
Indianapolis, Ind	75,074	St. Joseph, Mo	32,484
Jackson, Mich	16,105	St. Louis, Mo	350,522
Jacksonville, Ill	10,927	St. Paul, Minn	41,498
Jamaica, N. Y	10,089	Syracuse, N. Y	51,791
Jeffersonville, Ind	10,422	Taunton, Mass	21,213
Jersey City, N. J	120,728	Terre Haute, Ind	26,040
Johnstown, N. Y	16,626	Toledo, O	50,142
Joliet, Ill	16,145	Topeka, Kan	15,451
Kalamazoo, Mich	11,937	Trenton, N. J	29,910
Kansas City, Mo	55,813	Troy, N. Y	56,747
Keokuk, Iowa	12,117	Utica, N. Y	33,913
Kingston, N. Y	18,342	Vicksburg, Miss	11,814
La Crosse, Wis	14,505	Virginia City, Nev	13,705
Lafayette, Ind	14,860	Wallkill, N. Y	11,483
Lake Township, Ill	18,396	Waltham, Mass	11,711
Lancaster, Pa	25,769	Warwick, R. I	12,163
Lawrence, Mass	39,178	Washington, D. C	147,307
Leadville, Col	14,820	Waterbury, Conn	20,269
Leavenworth, Kan	16,550	Watertown, N. Y	10,697
Lenox, N. Y	10,249	Watervliet, N. Y	22,220
Lewiston, Me	19,083	Weymouth, Mass	10,571
Lexington, Ky	16,656	Wheeling, W. Va	31,266
Lincoln, Neb	13,004	Wilkesbarre, Pa	23,339
Lincoln, R. I	13,765	Williamsport, Pa	18,934
Little Rock, Ark	13,185	Wilmington, Del	42,499
Lockport, N. Y	13,522	Wilmington, N. C	17,361
Logansport, Ind	11,198	Winona, Minn	10,208
Long Island City, N. Y	17,117	Woburn, Mass	10,938
Los Angeles, Cal	11,311	Woonsocket, R. I	16,053
Louisville, Ky	123,645	Worcester, Mass	58,295
Lowell, Mass	59,485	Yonkers, N. Y	18,892
Lynchburg, Va	15,959	York, Pa	13,940
Lynn, Mass	38,284	Youngstown, O	15,431
Macon, Ga	12,748	Zanesville, O	18,120
Madison, Wis	10,325		

Curious Industries.

The work of the staff of officers appointed by the superintendent of the census to collect statistics relating to the industries and manufactures of New York city is, says the *Evening Post*, now approaching completion, and will show, in the opinion of Mr. Charles E. Hill, the gentleman in charge of it, a very satisfactory growth since 1870.

In the course of the investigation by Mr. Hill's deputies some singular industries were brought to light. It was found, for instance, that some use was made of old shoes, but exactly what use was hard to find out. Large numbers of old shoes were sold by rag pickers to certain men who disposed of them at a good price. It is well known that bits of old leather make the commercial article known as Prussian blue, but only a few firms manufacture it, and the new call for old shoes was evidently for some other purpose. In New York city and Brooklyn about three million pairs of old shoes are thrown away every year. Formerly old shoes were plentiful in the gutters of certain neighborhoods; now it appears that they are sought after as choice prizes in the rag picker's line. By dint of persevering inquiry it was discovered that the old shoes were used for three purposes. First, all shoes not completely worn out are patched, greased, and after being otherwise regenerated, sold to men who deal in such wares. Some persons wear one shoe much more than the other; these dealers find mates for shoes whose original mates are past hope. Secondly, the shoes not worth patching up are cut into pieces; the good bits are used for patching other shoes, and the worthless bits, the soles and cracked "uppers," are converted into Jamaica rum by a process known only to the manufacturers. It is said that they are boiled in pure spirits and allowed to stand for a few weeks, the product far surpassing the Jamaica rum made with essences, burnt sugar, and spirits. A gentleman who doubted the truth of this story stopped recently at a low grog shop in the neighborhood of the factory spoken of and inquired if they had any rum from old shoes. "No," said the barkeeper, "we don't keep it much now; the druggists, who want a pure article, all sell it, and the price has gone up. But we have had it, and we can get you some if you want it." How many old shoes go to a gallon of rum could not be ascertained.

It has been noticed by some deputies that while manufacturers are quite willing to put a valuation upon their manufactured product they hesitate about stating the value of the raw material and even return the schedules with the space for the value of raw material left blank. In one instance a manufacturer of tomato catsup returned a report giving the value of his manufactured product at $18,000 and the value of his raw material as nothing. His explanation was as follows: Every year in the coming season he sends to all the wholesale houses which make a business of canning tomatoes clean tubs, with the understanding that the women who trim and peel shall throw the skins and parings into these tubs; everyday the tubs are removed, the stuff in them ground up, fermented, flavored, and sold as tomato catsup to the extent of $18,000.

Another singular and decidedly pernicious business is the manufacture on a large scale of cheap candies from white earth or terra alba mixed with a little sugar and glucose. The deputy who investigated the confectionery business reports that seventy-five per centum of some candies is composed of these substances, and such candy, notably "gum drops," contain still less sugar. The effect of white earth upon the stomachs of the unfortunate children who buy these candies is yet to be determined by future autopsies. What is called a fine brand of castile soap has been found to be composed chiefly of this white earth and grease, but the evil effects of such an imposture are trifling compared to the results of turning children's stomachs into miniature pottery works.

Among the new industries which have sprung into existence during the last few years is the system of finishing in this city foreign goods imported in an unfinished condition. Foreign articles composed of several parts are now largely finished in this city, the parts calling for hand labor being imported while those calling for machine work are made here. In this way heavy duties are saved, although the articles are sold as imported goods.

The Photophone.

The opinion is gaining ground, especially among French *savants*, that the musical sounds produced by Professor Bell in disks of various substances, such as mica, India-rubber, metal, and wood, by holding them in the path of a rapidly interrupted beam of light, are really due to heat and not to light. Radiophonic notes, such is the new term, have been obtained by M. Mercadier from ordinary gas lamps without employing lenses to concentrate the interrupted beam, by simply bringing the receiving disk near the source. Even a plate of copper heated to a bright red heat produced very distinct musical tones, which gradually died away as the plate cooled to a dull red followed by obscurity. The fact that when the receiving disks were coated with silver on the side next the light the effects were feeble, and that when coated with absorbent lampblack they were strong, would seem to tell against Professor Bell's conclusion that the sounds were due to light.

It is a curious fact that when the radiometer was first brought out by Dr. Crookes he intimated his belief that its rotation was due to the impact of light waves; but heat is now known to be the cause of the motion.