

Catechu for Dissolving Boiler Incrustations.

Berlin is in possession of a pneumatic postal system, whereby letters can be sent through tubes by compressing the air behind or exhausting it in front of the package. Power is, of course, required, and is furnished as usual by steam.

In the selection of tubular boilers, says the *Deutsche Industrie Zeitung*, it was assumed that the water supplied by the Berlin water works was as free as possible from salts that produce incrustations, for the tubes lie so close together that it is almost impossible to clean the boilers.

After the boilers had been running a few months, however, it was found that a very hard incrustation was forming, that had already reached a thickness of 1½ inches. In consequence the boilers had to be cleaned every two months during the first two years that they were in use, and this was no small difficulty, for it had to be cut out. This induced them in the third year to try the experiment of adding pure catechu to the feed water. Eleven pounds of catechu were put in a boiler that had been well cleaned, and spread out over all the plates exposed to the fire, and each boiler was run eight weeks. At the end of that time there was no trace of any hard incrustation, but merely a slime that was easily removed.

This process has now been in use for four years in all the steam boilers used by the pneumatic dispatch, so that if the catechu has any injurious effect on the boiler or the machinery, it would have shown some trace of it before this time. This is by no means the case, nor can it be, for the quantity added is extremely small in proportion to the amount of water evaporated. The boilers in question evaporate, on an average, in the thirteen working hours, four cubic meters (about 140 cubic feet) daily, and only receive 11 pounds of catechu every two months, so that there is only 1 gramme of catechu to 48 kilos of water, or 1 to 48,000.

The catechu forms a paste or dough in the boiling water and rests on the plates over the fire; but as the stream of feed water is also directed to that place, it always comes in contact with fresh feed water.

It is true that catechu had been used with other chemicals years ago under the name of "incrustation powder" (*Kesselsteinpulver*), but this mixture exhibited the action of pure catechu only to a slight extent, and besides this it was added every day and required special feeding apparatus, so that it was very expensive.

SACRED EGYPTIAN SCARABÆUS.

The sacred Egyptian scarabæus (*Ateuchus sacer*) is in a biological as well as in an archaeological sense the most interesting beetle which inhabits the countries of the Mediterranean. It has been made famous by the honors paid to it by the ancient Egyptians; it played an important part in their animal worship. It is represented in their hieroglyphics, and displayed upon their monuments, and, hewn from stone in colossal proportions, was placed in their temples. Adrian speaks of it, and Pliny says, "This beetle makes monstrous pills of manure, rolls them backward with its feet, lays small eggs in these balls, from which beetles emerge, the ball serving as a protection to the young."

In cases of fever, besides the means employed by medical science, it was thought to be efficacious to bind on one of these beetles.

The head is semicircular with six deep indentations. These beetles fix upon a piece of manure, preferably cow dung, bear it away from the heap, and knead it into an irregular ball, in which the female deposits an egg. After they have made the ball, which is often larger than themselves, they roll it to a convenient spot, using their hind legs to direct the ball, and the other four legs for locomotion, so they seem to be standing on their heads, as the hind legs are elevated to guide the ball. Often one of the beetles pushes the ball with its head. This ball, which at first was uneven and soft, becomes, by much rolling, firm and smooth. They then dig a deep hole, in which they bury the completed ball. The filling up of the hole with earth finishes their wearisome labor, which was necessary to prepare a place for their young.

A second and a third egg require the same labor. At last, enfeebled by their labors, the beetles remain near the place where they have buried the balls and die. New life is developed in the buried balls, and the larva, as it emerges from the egg, finds a rich supply of provisions, by means of which it attains its full growth. It takes several months for the development of the larva. The next spring the beetles come forth from their birthplace, and the young, following the example of the parents, roll up balls in their turn.

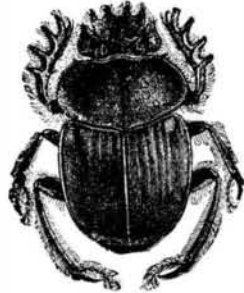
A German artist in one of his excursions into Italy observed a beetle employed in rolling a ball upon uneven ground. Unfortunately the ball rolled into a hollow, and the beetle exerted itself to the utmost to roll it out again; but

finding its efforts in vain it went to a neighboring manure heap and disappeared in it, but soon came forth again accompanied by three beetles. All four labored with their united strength, and at length succeeded in rolling the ball from the hollow. Scarcely were their efforts crowned with success than the three assistant beetles left the place and returned to their dwelling place.

Beetles possessing similar habits are found in almost every part of the globe, but they are not all equally skillful in the construction of the balls for containing their eggs.—From *Brehm's Animal Life*.

NATURAL HISTORY NOTES.

The Constancy with which Insects Visit Flowers has recently been the subject of an investigation by Messrs. A. W. Bennett and R. W. Christy, and the results of their observations



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are printed in the *Journal* of the Linnæan Society for August 14. Although very interesting the subject is not new, Aristotle having made the assertion that "during each flight the bee does not settle upon flowers of different kinds, but flies, as it were, from violet to violet, and touches no other species till it reaches the hive." Messrs. Bennett and Christy, however, did not confine their studies to the bee family, but extended them to various species of Lepidoptera and Diptera, and have placed on record a large number of interesting details. With respect to butterflies, Mr. Bennett thinks that, upon the whole, they exhibit but a small degree of constancy in visiting flowers, though the majority of those upon which they were observed to settle were either yellow or pink; and, after settling upon one of these colors, they appeared to show a marked tendency to adhere to it. Two species of Syrphidæ, or "hover flies," also showed little constancy, though this may be accounted for by the fact that these insects are rather consumers than carriers of pollen. But the Apidæ, or bee family, exhibited much greater constancy. Thirty-three observations were made upon different species of *Bombus*, or "humble bee." In four instances the bee visited the flowers of three distinct species, irrespective of color; in six instances the flowers of two species were visited, the

flowers of the saw-wort (*Serratula tinctoria*), obviously rejecting those of the knapweed (*Centaurea nigra*), which are not unlike them in general appearance, and which are of nearly the same color. It is an interesting circumstance, to which Mr. Bennett calls attention, that the constancy of the insect appears to be in proportion to the part performed by it in carrying pollen from flower to flower. Mr. Christy's observations are confirmatory of those of Mr. Bennett. He considers the hive bee to be perfectly methodic in its habits, at any rate while there is a fair supply of flowers, though when these are scarce it may not be quite so scrupulous. He also thinks that humble bees show a fairly high degree of constancy. The Lepidoptera observed by him were not so numerous as those watched by Mr. Bennett, but they seemed to exhibit more constancy.

"A much larger number of observations," says Mr. Bennett, "is, however, needed in order to determine with certainty any general law; and especially a careful microscopic examination of the pollen attached to the probosces, mandibles, legs, and under side of the abdomen and thorax. As regards preference for particular colors, the Lepidoptera paid, while under observation, 70 visits to red or pink flowers, 5 to blue, 15 to yellow, 5 to white; the Diptera, 9 to red or pink, 8 to yellow, 20 to white; the Hymenoptera, 203 to red or pink, 126 to blue, 11 to yellow, 17 to white."

Influence of Position upon Seeds.—A paper with this title was read by Dr. E. L. Sturtevant at the recent meeting of the American Association. The "position" referred to in the title is that of the individual seeds grown on a spike. The object of the experiment was to ascertain the difference in germinating power between seeds from the middle and from the ends of the spike. In experiments conducted at the New York Agricultural Experimental Station last winter it was found that, on an average, 91 per cent of butt-kernels, 88 per cent of central kernels, and 98 per cent of tip-kernels of flint corn germinated. Other experiments gave the following results: Of the butt-kernels planted, 79 per cent germinated; of the centers, 84 per cent; and of the tip-kernels, 86 per cent. For flint corn, the tip-kernels have the strongest vegetative power.

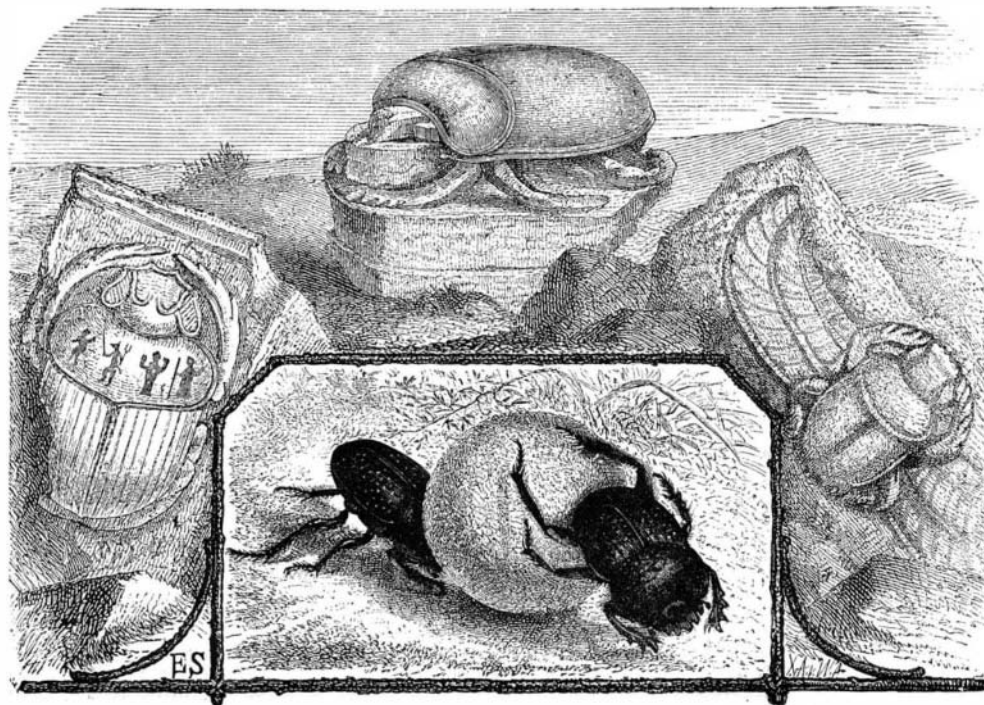
The Gardener Bird of New Guinea.—The gardener bird (*Amblyornis inornata*), a native of the Arfak Mountains in New Guinea, and the first report of the existence of which was brought to M. Bruijn by Malaysians, appears from the studies of M. Beccari to excel the Australian bower birds (to which it is allied) in the erection of a pleasure bower. The center of its edifice is formed by a small shrub in an open spot in the forest. Moss is piled up around this, and then a number of branches plucked from an epiphyte are planted in the soil in an inclined position, so as to form the walls of a conical hut, which is entered through a small aperture. These branches continue to vegetate for some time. In front of the entrance the bird makes a lawn of tufts of moss carefully separated from adhering pebbles, particles of wood, or other plants. Upon this green carpet he strews the violet fruits of *Garcinia* and the flowers of a species of *Vaccinium* growing near, renewing these as they wither.

Selenotropism of Plants.—Mr. Ch. Mussat (*Comptes Rendus*, xcvi., page 663), struck by the heliotropic movements of plants, has made some experiments on the influence of the moon. He sowed seeds of plants noted for their sensitive properties, such as *Lens esculenta*, *Ervum lens*, and *Vicia sativa*. When the plants were a few centimeters in length they were placed in the dark. The branches thereupon became delicate, long and white, while the leaves were tinged with yellow. On the 22d, 23d, and 24th of February, when the sky was exceptionally clear, they were exposed to the direct light of the moon from 9 P. M. to 3 A. M. Almost immediately the branches became curved, and presented their concavity and terminal bud toward the moon. The bud seemed to follow the moon, and, when the plants were placed at a window with a western aspect, a fresh movement was observed, and this continued until the moon disappeared behind the hills.

M. Mussat proposes to call such movements *selenotropie*.

The Oregon.

The Guion fleet of steamships has been enlarged by the addition of the Oregon, a steamer which is 520 feet long, 54 feet wide, 40 feet 9 inches deep, and has a tonnage of about 5,000 tons. As accommodation is provided for 542 passengers, the arrangements for ventilation must be proportionally effective. The cabins, staterooms, dining rooms, and steerages are ventilated by means of twenty-six patent air pump extracting ventilators and twenty patent down casts. They are all of 24-inch diameter, with 12-inch pipes. By means of these appliances there can be no doubt that the traveling public will have all the sanitary comforts at sea that they can have in a well arranged hotel on shore, and this is the principle which the owners of the fleet have in view.



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color of which was nearly the same; and, in twenty-three instances, the bee confined itself to a single species, though the plants chosen by the different bees were of the most various kinds and colors—some shade of pink, however, largely predominating. There could be no doubt as to this constancy being intentional, the bee frequently traversing a considerable distance, without alighting, so as not to mix its pollen. But it would appear as if color were not the sole guide, since both observers found that the same bee would visit white and purple foxgloves indifferently, while passing by flowers of any other species. The common hive bee was observed six times, and only upon one occasion was it seen to visit the flowers of more than one species, and then it made one visit to the blue scabious (*Scabiosa succisa*), followed by nine in succession to the pink centaury (*Centaurea scabiosa*). Another bee paid twenty-four consecutive visits to