COMPOUND NEST OF THE C. PALUSTRIS AND THE A. PHŒNICEUS.

BY DANIEL C. BEARD.

Almost every one whose business or occupation has introduced him to an intimate acquaintance with the salt marshes that line our eastern coasts, is familiar with the odd chattering notes of the marsh wren. This little bird finds its board and lodging among the reeds and rank grasses of the damp salt meadows. Morning and evening its song, if such vocal efforts can be so called, may be heard, but especially does it delight to sing at night. Often after a long sail, when belated and overtaken by night, the writer has welcomed the harsh, but not unpleasant, notes of the long-billed marsh wren (*Cistothorus palustris*) as a signal from shore and home.

Not long since a boating party caught in a dense fog only discovered their dangerous proximity to the shore from the warning notes of one of these little coastguard.

Other birds find refuge and sustenance among the salty sedges inhabited by the marsh wrens. Among them may be seen the brilliantly decorated *Agelaius phœniceus*, commonly known as the redwing or swamp blackbird. The lustrous black plumage of the male bird shines in the sun, giving out greenish metallic reflections. Its shoulders and lesser wing coverts are ornamented with crimson epaulets, giving it a very martial and rich appearance, in strong contrast with the modest brown plumage of its friend and neighbor the marsh wren.

Some time ago the writer published an article and illustration in this paper of a fish hawk's nest, the interstices of which were filled in with the nests of the cow blackbird (*Quiscalus purpureus*), making a sort of compound nest, or tenement house, of the structure. Following the above mentioned article was a second, illustrating and describing the strange two story nest the summer yellowbird builds to cover the eggs which that tramp, the cow blackbird, delights to surreptitiously deposit in the nests of smaller birds.

The same young collector that secured the writer the yellowbird's double nest, discovered and brought to him another two-story nest. This time both nests bore unmistakable evidence of being inhabited. The lower compartment, from its peculiar spherical form and the reeds and cat tail cotton of which it is composed, would be at once recognized as the nest of the marsh wren, even if it did not contain the little chocolate colored eggs of that bird. The upper nest is cup-shaped, three inches inside depth and diameter. The outside is made of coarse straw and fibers, and the inside lined with fine grass. A single glance suffices to prove it to be the nest of a swamp blackbird. Two bluish-green eggs, with strange hieroglyphic markings on the end, occupy the upper floor, and three little brown eggs are hidden in the lower nest. The blackbirds must have commenced the upper nest about as soon as the wrens finished the lower one.

In both the upper and lower stories of this seaside tenement house the eggs were warm when discovered, which proves that the mother birds had been off the nests but a few moments. The writer knows of no other recorded instance of a compound nest occupied by the red-winged blackbird and the little marsh wren.

The accompanying sketch, made from nature, shows the construction and difference in style of architecture of the nests, as well as the difference in the size and appearance of the birds themselves. It is a fact worth noting that in all three instances of compound nests the blackbird plays the part of a parasite in a greater or less degree.

COMPOUND NEST OF THE C. PALUSTRIS AND THE A. PHŒNICEUS.

The Preservation of Eggs.

Much scientific attention has been devoted in France to the preservation of eggs. The leading principle of all processes is the protection of the interior of the egg from the action of the atmosphere, and consequently it has long been settled that only the freshest eggs are eligible for preservation. To the solution of the problem of how to prevent the air from penetrating the shell of the egg, the experiments of such eminent *savants* as Musschenbroek, Réaumur, and Nollet have valuably contributed. They all agree that the most practicable method is to envelop the new-laid egg in a light coating of some impermeable substance, such as wax, tallow, oil, or a mixture of wax and olive oil, or of olive oil and tallow. Réaumur suggests an alcoholic solution of resin, or a thick solution of gelatine. Nollet experimented successfully with India-rubber, collodion, and various kinds of boot-varnish. In practice, the most successful method has been that of Cornier, of Mans. This consists in covering the eggs with a varnish, the composition of which is kept a secret. The eggs are packed on end in sawdust, and, it is said, will preserve their freshness during quite nine months in any climate. Cadet de Vaux suggested the plunging of eggs for twenty seconds in boiling water, in order to coagulate that portion of the albumen nearest the shell, and then to pack them in vessels half filled with sifted cinders. This process—which, by the bye, has been well known in some parts of Scotland for many years—yields excellent results, but if neglected for but a second or two, the eggs are liable to harden. The process known as "liming" in England, and as the Cadet-Gassicourt process in France, is very popular; on the other side of the Channel, however, "limed" eggs are never eaten *à la coque*, but only in the shape of omelettes, etc. Some preservers claim to obtain better results, as far as the taste of the egg is concerned, by substituting ordinary salt for lime. The solution, it is said, penetrates the shell, and so acts upon the organic matter as to diminish its susceptibility to decomposition. The eggs are immersed during several hours. Appert, the Columbus of food preservers, gave some attention to the subject of egg-preservation. His favorite process was to introduce the eggs into a bottle half filled with bread crumbs to prevent breakages. After carefully corking the bottle, he placed it for several minutes in a sand bath, the temperature of which he kept at 70°. For home consumption, the French peasantry have for ages preserved their eggs in a very simple fashion. They take a wooden case, or a large barrel, and pack them in thick layers of sawdust, fine sand, chalk, bran, cinders, or coal dust, so that they do not touch each other. In the Maritime Provinces, the peasants use layers of ashes moistened with salt water. Both these processes are successful. Drying eggs, and reducing them to powder (an invention patented by Chambard in 1852) is another method of preservation that is profitably pursued in France.—*London Grocer.*

The Suez Canal in 1882.

I was glad to see how much of the banks are now cased with stone. Trees grow with difficulty in the sand and their roots suffer from the salt water. A sandy bank is carried by the wash of the steamers into the deep water channel. But this stone casing resists the wash, and when it is complete the company will be able to increase without danger their regulation speed. We met with no obstacle for two hours. In this great highway of nations we saw no life save the wild marsh birds and the waste of water stretching away to the yellow desert. There are *gares* or passing places every few miles, where the deep waterway is widened from twenty-four to fifty yards, and sometimes more, and a signalman system stops or allows to pass the ships according as the run is free or occupied. We passed the first *gare* successfully, but at the second the ball was hoisted above the flag, which in canal language means "go into the siding." Nothing came by before sunset, when all traffic ceases, and we lay in the quiet moonlight with every intention to proceed at sunrise. But when I came up next morning to see the start I found a fleet of great ships, each with its noisy little tug and yellow flag at the masthead slipping along in single file. It was a grand way of realizing the work of the canal. Nineteen vessels went by, averaging, our captain told me, 1,500 tons burden. All save two carried the British flag. Three were crammed with pilgrims, forecastle, main-deck, and quarter-deck, one mass of life. Even the boats were full of them, and from under a canvas awning peeped the pale faces of women. One lot were Russion pilgrims from the Caucasus—savage looking fellows in fur caps and black cloaks; the others were Algerians and Moors in turban and burnous. The rest of the ships were cargo-laden, 22 and 23 feet in the water. All went by safely till the 17th, the Scotch Greys, came. She went a yard or two out of her course, and at once was aground. She had passed us, but others had still to come, and there was nothing for it but to wait till the Scotch Greys got free. Hawsers were made fast to stern and bow on either bank, and after an hour's shouting and steaming and winching, the big ship swung into place again. The rest came by without disaster, and we got under way ourselves at eleven o'clock.

The canal is not big enough for the present traffic. Shipping to the extent of over 3,000,000 tons passes through every year, and it is steadily on the increase. Ships have to wait their turn, and much valuable time is wasted at either end and in the passage. The accommodation may be increased in two ways. The whole length of the canal may be widened so as to allow of ships passing each other everywhere. Such a work would not be difficult, but it would be very costly. The deep-water passage would have to be more than doubled in width, as the slow speed makes steering difficult, and ships in passing would require plenty of sea room to avoid accidents. The present width of 25 yards would have to be raised to 60, but it would not be necessary to increase the width of surface of the whole waterway, which is already 100 yards from bank to bank. The second mode of increasing the facilities of passage is more feasible, and has much to recommend it. It consists in a considerable increase of the number of *gares* or passing places, and in the lengthening of those already in existence. There are at present thirteen, and they might easily be increased to twenty. The same precautions now practiced would be still enforced in the passing of ships. The block system would be carried out from *gare* to *gare*. The buoying of the passage is already excellent, and there would be no increase in the danger of fouling and jamming. The consequences of such accidents in so narrow a waterway as the canal are so serious that I think, on the whole, the increasing of the *gares* is most to be recommended. But one or other improvement is necessary.—*Correspondent London Times.*

An Eighty Pound Hailstone.

Considerable excitement was caused in our city last Tuesday evening by the announcement that a hailstone weighing eighty pounds had fallen six miles west of Salina, near the railroad track. An inquiry into the matter revealed the following facts: A party of railroad section men were at work Tuesday afternoon, several miles west of town, when the hailstorm came upon them. Mr. Martin Ellwood, the foreman of the party, relates that near where they were at work hailstones of the weight of four or five pounds were falling, and that returning toward Salina the stones increased in size, until his party discovered a huge mass of ice weighing, as near as he could judge, in the neighborhood of eighty pounds. At this place the party found the ground covered with hail as if a wintry storm had passed over the land. Besides securing the mammoth chunk of ice, Mr. Ellwood secured a hailstone something over a foot long, three or four inches in diameter, and shaped like a cigar. These "specimens" were placed upon a hand car and brought to Salina. Mr. W. J. Hagler, the North Santa Fé merchant, became the possessor of the larger piece, and saved it from dissolving by placing it in sawdust at his store. Crowds of people went down to see it Tuesday afternoon, and many were the theories concerning the mysterious visitor. At evening its dimensions were 29 x 16 x 2 inches.—*Salina (Kansas) Journal.*

Awards to American Electricians.

Among the awards to exhibitors at the International Electrical Exhibition at the Crystal Palace were the following: A diploma of honor to the Anglo-American Cable Company; a gold medal to T. A. Edison for lighting apparatus, etc.; a gold medal to the Anglo-American Brush Light Company for the Brush dynamo machine and arc lamp; a gold medal to the White House Mills, of Hoosac, N. Y., for a dynamo machine; a gold medal to the Direct United States Cable Company; a gold medal to Professor A. E. Dolbear, of Boston, for an electrostatic telephone; and a silver medal to the Philadelphia Dynamic Company.

Etching Recipes.

BY MAJOR J. WATERHOUSE, B.SC., ASSISTANT SURVEYOR-GENERAL OF INDIA.

MORDANTS FOR ZINC.

The comparative cheapness of zinc would give it an advantage over copper or steel for engraving and etching with the graver or point, but it does not seem to be recommended for these purposes. It is hard to cut with the graver, and, though it bites easily, it is not suitable for fine work. Another defect is that it will not stand a long impression; but this may be overcome by surfacing the plate with copper. The principal uses of this metal for printing purposes are for surface printing or zincography, in the same manner as lithography, and for the process of biting in relief, and zincotypography or Gillotage, now so largely employed as a substitute for wood blocks. It can also be engraved very delicately in the same style as engraving is done on stone through a coating of gum.

The etching fluids for zinc are of two entirely different kinds: first, mixtures of gum and weak acids, used for preparing plates for zincographic printing in the lithographic press, or for the preliminary inking preparatory to being bitten in relief by the Gillotage process; and secondly, mineral acids, more or less dilute, used for biting in relief and ordinary etching.

Zincographic Etching.—This kind of etching is more a preparation of the plate for printing than engraving or biting, the object being merely to fill up the pores of the metal with gum, and prevent it receiving printer's ink from the roller elsewhere than on the lines of the drawing.

The solution most commonly employed for this purpose is the mixture of gum and decoction of galls, in use at the Ordnance Survey Office, Southampton, and given by Sir Henry James in his work on *Photozincography.* It is prepared as follows: 4 ounces of Aleppo galls are bruised and steeped in 3 quarts of cold water for twenty-four hours; the water and galls are then boiled up together, and the decoction strained. The gum water should be about the consistency of cream. One quart of the decoction of galls is added to 3 quarts of the gum-water, and to the mixture is added about 3 ounces of phosphoric acid, which is prepared by placing sticks of phosphorus in a loosely-corked bottle of water, so that the ends of the sticks may be uncovered. The oxidation of the phosphorus produces phosphoric acid, which dissolves as fast as it is formed.

The etching solution should only just mark a piece of plain zinc.

In Richmond's "Grammar of Lithography" the following modifications of this formula are given:

Decoction of nutgalls	¾ pint.
Gum water as thick as cream	¼ "
Phosphoric acid solution	3 drachms.

Boil 1¼ ounces of bruised nutgalls in 1¼ pounds of water till reduced to one-third, strain, and add 2 drachms of nitric and 4 drops of acetic acid.

Richmond recommends, however, the use of simple decoction of galls without acid, and gumming-in after etching.

Knecht, in Roret's "Manuel de l'Imprimeur Lithographe," gives the following, containing copper, but this I find gives an unpleasant dark tone to the zinc:

Gallic acid	1 centigramme.
Water	1 liter.
Gum arabic	4 grammes.
Nitric acid	2 milligrammes.
Sulphate of copper	4 "

Sulphate of copper	50 parts.
Rock alum	40 "
Sulphuric acid	20 "
Gum arabic	60 "
Water	1,000 "

Husnik gives the following, also used by Hannot at the Depot de la Guerre, Brussels:

Gum arabic	40 parts.
Sulphate of copper	2 "
Gallic acid	5 "
Nitric acid	½ part.
Water	1,000 parts.

Motteroz uses gum-water acidulated with a few drops of muriatic acid, so that it will not visibly bite the plate—or better, decoction of nutgalls.

Moock gives:

Water	100 grammes.
Gum arabic	15 "
Nitric acid	2 drops.
or muriatic acid	4 to 5 "
Solution of nutgalls	10 grammes.

Scamoni has the following, by Garnier: Boil about 1¼ ounces of bruised gall-nuts in a pint of water, till reduced to one-third, filter, and add 2 drops of nitric acid and 3 to 4 drops of muriatic acid. For very fine work this may be weakened with water. It is applied for about a minute, then washed off, and the plate gummed.

Zincotypographic Etching.—In biting zinc plates in relief, the acid generally used is nitric, of different degrees of strength according to the nature and state of the work.

After the transfer is made, the plate is etched with one of the foregoing preparations, then inked-in and dusted with finely-powdered resin, which adheres only to the lines. This procedure is followed after every biting, the plate being warmed to melt the resin and inky coating, so that it may run down between the lines and protect them from the undercutting action of the acid.

Kruger, in his "Die Zinkogravure," recommends, for the first relief etching, nitric acid 30 to 40 drops to 100 grammes of water, applied for five minutes. For each subsequent etching 8 to 10 drops of acid are added for each 100 grammes of water, and the time is increased, by degrees, from five to fifteen minutes. For the final etching of the broad lights he uses:

Muriatic acid	4 parts.
Nitric acid	1 part.
Water	16 parts.

To soften down the ridges between the lines the plate is inked and dusted as before, and etched with dilute nitric acid at 5 per cent applied for about a minute, and the inking, dusting, and etching repeated as often as may be necessary.

According to Husnik, the first two bitings are given with 1 part of nitric acid to 40 of water, the first biting lasting two minutes, the second four to five minutes. For the third biting the acid is used double the strength, and applied for five minutes. The acid is made stronger for each successive biting.

Moock ("Impression Photographique aux Encres Grasses") gives a first biting with nitric acid at 2 per cent for two or three minutes, adding about the same quantity of acid for five successive bitings, gradually increasing the time. After the first five bitings, the plate is thoroughly cleaned, strongly heated, well inked again with a harder ink, and rebitten with acid as strong as the last used; the operation is repeated for four more bitings, using less heat, and biting less and less each time. These last bitings are for smoothing off the edges of the lines.

In his "Instruction in Photography," Captain Abney gives the following process:

Having made the transfer in the usual way, and dusted it with resin, flood the surface of the zinc plate with a 10-grain solution of sulphate of copper, which precipitates copper on the uncovered parts, and forms a copper-zinc couple. It can then be etched with very dilute acid.

Hydrochloric acid	1 part.
Water	500 to 750 parts.

This is contained in a rocking trough kept constantly in motion. The first etching takes about twenty minutes. The plate is then washed and inked, dusted and coppered again, and then etched with acid twice as strong, the operation being repeated as often as may be necessary.

The following method is somewhat similar, though, in this case, the acid bites the parts not covered by the copper.

A zinc plate, covered with varnish, and etched with a point, is treated with a neutral solution of copper, which deposits copper on the lines. The varnish is then removed, and the plate etched with muriatic acid, which bites the zinc, leaving the copper untouched. As soon as a perceptible relief is obtained, the plate should be inked and bitten in the ordinary way.

A very excellent method of biting zinc in relief is by galvanism. Roret's Manual—before quoted—gives two methods by Dumont and Devinceuzi.

In Dumont's Method the plate, having been inked in, and dusted with resin, has a copper conducting wire attached to it, and is then placed in a wooden frame parallel to a copper plate of the same size, at a distance of about twelve inches, and the whole is plunged into a bath of sulphate of zinc. The zinc plate is connected with the carbon pole of a Bunsen battery, and the copper plate to the zinc pole. A weak current is allowed to act, and the sufficiently-bitten parts are stopped out from time to time.

M. Devinceuzi's process is similar to the above, and, from trial, I know works very well.

The plate, having been rolled up with a strongly-resinous ink, is slightly etched with very dilute sulphuric acid, to clean the surface, and is then plunged into a solution of sulphate of copper at 15° Baumé (about 70 grains to the ounce), in connection with a plate of copper of the same size, placed about one fifth of an inch away from it. The plate is taken out every minute or so, to remove the copper, and at the end of from four to five minutes is sufficiently bitten to yield good impressions from a chalk original. A drawing with a pen may require seven to ten minutes.

Before leaving this part of the subject, it may be mentioned that, in the processes for biting with nitric acid, it is essential to keep the acid in constant motion, and in some establishments the strength of the acid is maintained during the biting by allowing nitric acid to fall drop by drop from a bottle or other vessel placed above the trough.

Deep Etching.—For simple etching on zinc, Seymour Haden recommends 1 part nitric acid to 3 of water; or,

Hydrochloric acid	10 parts.
Chlorate of potash	2 "
Water	88 "

Dissolve the chlorate of potash in half the water—boiling—and mix the hydrochloric acid with the remainder. The two solutions are added together for use.

Kochler ("Lalanne's Etching") says 1 part of nitric acid to 8 parts of water is equal in effect to equal parts of acid and water used with copper for the same length of time.

A. Martin uses 1 part nitric acid to 2 of water.

Kruger ("Die Zinkogravure") gives:

Sulphate of copper	2 parts.
Chloride of copper	3 "
Water	64 "
Muriatic acid	8 "

also

Nitric acid	1 part.
Water	40 parts.

M. Gourdon has proposed a curious process of photo-engraving on zinc, founded on M. Merget's discovery that if zinc be covered by precipitation with certain metals, it is only bitten by nitric acid in the parts left uncovered, while, on the contrary, dilute sulphuric, muriatic, acetic, and other acids will bite it only in the parts covered by the other metal. Thus if zinc is covered in parts, as by writing, with a thin coat of powdery platinum, the parts covered with the platinum may be etched with sulphuric acid diluted with 7,000 parts of water. If gold be substituted for platinum, sulphuric acid diluted with 5,000 parts water will etch it. Silver requires 3,500 parts water; tin, 1,500; antimony, 700; bismuth, 500; lead, 400.

M. Gourdon takes an ordinary silver print, fixed, but not toned, and well washed, and transfers it, face downward, on a plate of zinc. It is moistened on the back, first with ammonia, and then with a solution of cyanide of potassium, pure, or mixed with carbonate of soda. After a while the silver image will be regularly transferred to the zinc, and can be etched with very dilute sulphuric acid to form an engraved plate.

Boivin plates a zinc plate with silver, treats it in the dark-room with an alcoholic solution of iodine, washes it, and passes over it a solution of tannin or pyrogallic acid, and dries.

The plate is exposed to light for a few minutes under a cliché, and then plunged in the dark into an electro gilding bath attached to the negative pole of the battery.

Those parts of the plate where the light has acted on the iodide will take a coating of gold, while the other parts will refuse it. The iodide of silver is dissolved with cyanide of potassium, and the plate is then bitten, the gold parts forming a reserve.

Moock etches zinc with one or two Daniell cells, the plate to be etched being in a separate trough containing dilute nitric acid at 3° B., and attached to the copper pole of the battery, while the conducting wire from the other pole dips about an inch into the acid. The etching takes an hour or two, according to the subject, and, if necessary, parts can be stopped out when sufficiently bitten.

According to Scamoni, sulphuric, nitric, muriatic, and pyroligneous acids all etch zinc, but must be well diluted with 20 to 30 parts of water.

Mordants for Brass and Bronze.—Neither brass nor bronze seems to be much used for book-work engraving. According to Kruger, the mordants for brass are much the same as for copper.

For surface printing on brass in the lithographic manner, Roret's Manual gives:

Gum arabic	8 parts.
Nutgalls	2 "
Nitric acid	1 part.
Phosphoric acid	4 parts.
Water	80 "

For etching bronze, the following is given in Roret's "Manuel du Graveur:"

Pure nitric acid at 40°	100 parts.
Muriatic acid at 20°	5 "

—*Photo News.*

Accident in a Grain Elevator.

The large elevator, A, of the New York Central Railway, at the foot of West 65th street, was seriously imperiled August 1, by the breaking of a shaft on the top floor. The elevator is 350 feet long, and 145 feet high. It is operated by two powerful engines in the basement, the power being transmitted by a rubber belt (300 feet long and weighing 3 tons), which connects the driving wheel of the engine with a shafting wheel on the top floor. The shafting wheel weighs 4 tons, and connects with a horizontal steel shaft, 7 inches in diameter, running the whole length of the building. This shaft broke close to the wheel, which was thrown out of place with great violence. The shaft was bent and twisted. The friction of the displaced belt against the sides of the openings in the floors caused a burst of flame at each point of contact, but fortunately the belt slipped from the wheel, and its furious motion was stopped before the flames got beyond control.

Cotton Stems for Cattle Food.

Mr. Edward Atkinson has found a new element of value in the cotton crop, and one which promises to materially advance the prosperity of Southern farmers. It appears that for each bale of lint there are 1,500 pounds of stems, which are very rich in phosphates of lime and potash. When ground and mixed with ensilage or cotton seed meal (which is too rich for use as fodder in large quantities), the stem mixture makes a superior cattle food, rich in all the elements needed for the production of milk, meat, and bone. It is believed that this utilization of the cotton stems, hitherto a nuisance, will prove to cotton growers a new source of wealth, and in many parts greatly facilitate the raising of stock, by furnishing a substitute for grain, which now has to be brought from the West for stock feeding.

THE FOUR GREAT PORTS.—Liverpool ranks as the most important port in the world, with an annual tonnage of 2,647,372; London stands second, with a tonnage of 2,330,688; Glasgow third, with 1,432,364; New York fourth, with a tonnage of 1,153,676. As a manufacturing city New York leads the world.

BENZINE will answer much better to exterminate roaches, moths, etc., than anything else. It will not hurt furniture in the least, and can be easily applied.