Correspondence.

Notes on Bird Life in Texas.

To the Editor of the Scientific American:

In connection with the interesting article of Mr. E. M. Hasbrouck, on "Forms of Bird Life in Central Texas," in the SCIENTIFIC AMERICAN of October 22, I find the following memoranda in my note book, upon the subject of nidification : "Victoria County, Texas, September 26, 1887.—While hunting prairie chickens, on open prairie, my dog put up a dove (*Z. Caralinensis*). The bird went off with the peculiar fluttering, crippled movement that indicates the proximity of nest or young. On examining the locality, found nest on the ground, with two eggs. Incubation apparently just begun. As I had no means of carrying them, I did not take eggs."

"Victoria, Texas, October 19, 1887.—While quail hunting two miles west of this city, my dog nosed out of a bunch of high weeds a young mocking bird (*M. polyglottus*), which, from appearance of plumage and flight, was evidently not more than two or three days out of nest."

In regard to the great speed attributed to the chaparral cock or paisano, am afraid Mr. Hasbrouck derives his information on this point from the romances of some native Texan, rather than from personal observation.

So far as my experience with the bird goes, although they are certainly very swift of foot, they are by no means capable of attaining the exceeding high rate of speed with which they have commonly been credited.

I once undertook to run one down afoot, and would certainly have done so, if it had stuck to the road, as I was rapidly gaining on the bird, when it took to the chaparral. Have frequently raced them on horseback, and never failed to outrun and drive them into the brush, although I never succeeded in putting one to flight by chasing it. C. S. WELLS.

Victoria, Texas.

Drawings for Process Work.

To the Editor of the Scientific American:

Drawings for process work are made on all kinds of Bristol board, ledger paper, Whatman's drawing paper, grained drawing papers, such as Steinbach, Day's grained, enameled, printed and embossed cards, photographic paper, plain Saxe or Clemens leatherized, and heavy coated enamel papers, such as Day's scratch board.

The implements used for coarse work are ordinary writing pens and for finer work, Gillot's map pens, Crowquills, No. 290 Somerville lithographic pens, and Keuffel & Esser's lithographic pens. Some of the most beautiful line work can be drawn with a brush such as is used by miniature painters, viz., red sable No. 0 or No. 1, if it is trimmed down until but eight or ten hairs are left to form a point.

There are all kinds of ready ground drawing inks in the market, but none so good as freshly ground India ink, which can be ground readily, perfectly and absolutely black, in an ordinary saucer, and is the very best working medium that can be used for pen or brush work. Any ordinary saucer will do, and for an inkstand buy a common brass thimble, to which fit a cork. Fill the thimble with water as a measure of the quantity of ink required. Pour this into your saucer and rub up your India ink until you think it sufficiently black. Then keep up the rubbing five or ten minutes longer. Now add one drop only of glycerine, and rub a little more, and the ink is made. To mount the inkstand, cut a potato or turnip in half, scoop out a hollow for the thimble, using the flat cut surface as a base for the inkstand, and when the pen fouls, jab it into the vegetable, which will clean it. To pour the ink from the saucer to the inkstand, make a long gutter of writing paper, by which it can be poured in without spilling a drop.

Lithographic crayons, No. 1 Lemercier's or Currier's, are used for drawing on the grained papers, and can be mixed with pen work thereon. By warming the back of a drawing made with lithographic crayons, they are fixed more firmly to the paper and made blacker. Drawings on enameled board are made more readily with a brush than a pen. Solid blacks can be painted in sparingly with a camel's hair brush. Pen lines run into these solids, impinging on the blacks, can be picked up with the point of a sharp scraper and carried into the solids, giving the effect of a wood engraving. This work can be cross-lined with a brush, giving the effect of white stippling. All drawings for process work should be pure black and white, even the finest lines. Their color is best ascertained by using a magnifying glass.

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Mosquito Bites.

According to Dr. Gerard (*Archives*), the inconveniences resulting from bites by mosquitoes and gnats, especially when recent, may be relieved by rubbing the bitten spot with chloroform. The swelling quickly decreases, and the pain and itching disappear.

The Zalinski Dynamite Gun.

The illustrations of the recent trials of the Zalinski dynamite air gun, published in the SCIENTIFIC AMERICAN, were reproduced in *Engineering*, but its correspondent, in describing the experiment, could not refrain from sundry sneering observations. To do otherwise would not be English, you know. His remarks have called forth the following sensible comments from a correspondent of the latter paper :

"If your published account of the experiments with the American dynamite gun be a faithful record of actual occurrences, the invention promises to mark a new era in naval gunnery and warfare.

"It seems a pity that your New York correspondent should think fit to sneer at the views of theorists rather than to state their theories and show how they are erroneous. Theory is never contradictory to practice if all the circumstances surrounding each case are properly weighed and examined. Lieutenant Zalinski's success is probably due to his theories being nearer to the truth than the theories of those who disagreed with him. The Mark Twain style of your correspondent increases the difficulty of a reader who wishes to arrive at the real value of the invention ; but as I understand that the small sketches on page 427 of *Engineering* are prepared from instantaneous photographs, I will with your permission examine them rather than the flippant remarks by which they are accompanied.

"Each sketch [see SCIENTIFIC AMERICAN of October 1, 1887] is practically scaled, because the length of the vessel, shown on Fig. 1, as she floated prior to her destruction, is 80 feet. It will be seen that her length of mast is about the same.

"The first important fact revealed by Figs. 4, 5, 6 is that the vessel was moored in water so shallow that it only covered her deck by about half a fathom after she sunk in say a depth of 2½ fathoms. Consequently, when the vessel was floating, she had a convenient shell arrester placed under her bottom at the best distance to insure a successful explosion in the event of the fuse being unduly retarded. The shells were fired at a high elevation, 15 degrees, and fell at a much larger angle. If the fuses of the second and third loaded shots were purposely arranged with an excessive retardation, the shells would be lying on the bottom when they exploded, and the great difficulties engendered by time fuses would thus be avoided. Whether this was done or not, the experiments would have been much more satisfactory and convincing had the vessel been moored in deep water.

"Figs. 2 and 3 show that the charges (of 55 pounds of high explosive) were at a very good submersion to obtain maximum effect when they exploded. Fig. 4 shows a shot in which the fuse was evidently arranged to explode the shell on graze. Fig. 6 shows that the shot there depicted was fired when the shell was only submerged 3 feet or 4 feet.

"The results which you have been enabled to publish are of the greatest interest, and it is to be hoped that our government will take the matter up without loss of time. The possibility of projecting large charges of high explosive to a considerable range is established. The accuracy of gigantic air guns, and the facility with which range can be altered by the air pressure, as well as the quick training of the guns, are also apparently indisputable. But the success of the system centers on the efficiency of the fuse, so that the charge shall explode when properly placed, both horizontally, as regards the position of the ship, and vertically, with reference to the water surface. To do this successfully in deep water must be very difficult. If it can be done, both the inventor and the United States authorities who have so energetically enabled him to develop this new engine of war must be congratulated on their success.

"If the invention be as good as it now seems to be, it will be sheer waste of public money to spend large sums on any form of controlled locomotive torpedoes, however perfect they may be ; for it is evident that no system of the kind can compete with one that hurls large torpedoes through the air to their destination at the rate of one per minute per gun. J. T. BUCKNILL."

Ants and their Ways.

Much has been written about the industry and sagacity of the ant. Dr. Bonavia, in a recent number of the *Gardeners' Chronicle*, relates his observations on the habits of ants in India, in which he says :

"On one occasion I killed a wasp—the small yellow wasp that is so common in India. Soon after, I observed an ant moving about on the sill of a window. It struck me as a good opportunity to observe what steps this ant would take if brought in contact with the dead wasp. I placed the wasp in the path of the ant and watched the result. The ant, on finding the wasp, climbed over it and explored it thoroughly in all directions. Having satisfied itself that this was a good find, it descended, and ran down the wall of the window and across a very rough grass mat made of the Saccharum moonja (the moonj or surput matting of India). It galloped across the room over this rough surface as hard as it could go in a particular direction, and disappeared under the wooden sill of a door. I still watched to see what would happen. Presently a long string of ants in single file came out and followed the exact course that the foraging ant had taken. They crossed the mat in the same course, and went up the wall straight to the wasp. I left them in peace, and some time after I found only the shell of the wasp. They had eaten up all its interior, and returned home. It is evident that single ants leave the nest, as scouts or explorers, on foraging expeditions, and go to long distances. By some scent left on their course, they are able to retrace their steps to their nest. The ants in the nest, probably by some scent of the body found which the exploring ant brings with it, are made to understand that something good to eat has been found. Guided by the exploring ant, or by the scent it may have left in its track, the whole nest or a portion of it sallies out, and goes straight to the find. If the body found is easily dragged home, the column does so, in procession, some preceding, some dragging, and some following the treasure. Otherwise they set to and eat up what portions they can of the thing found. This trait in ants is most interesting. Solitary ants are seen in all directions exploring and careering up and down the stems and leaves of plants. If they come across a flower with its nectar approachable, that flower quickly becomes crowded with other ants. Their feeling organs appear to be their antennæ. As they move about and explore, their antennæ are always very active, and projected before them. They stop here and stop there, and move these sensitive organs as if their whole attention were directed to the impressions received by them, and it appears they decide what course to take according to the impressions conducted by their antennæ. When two ants of the same kind going in opposite directions meet they never "cut" each other and pass on, but invariably stop and have a chat, so to speak, and communicate to each other the news. How they do this I cannot tell, nor can I tell exactly how light communicates to our own brain the presence of objects outside of us and at a distance from us.

The Water Jet.

One of the questions submitted to railroad companies by the International Commission of the Congress of Railroads was as to the question of the use of a jet of water or steam to increase the adhesion of locomotive wheels. The companies have submitted answers to this question, which are published in the *Bulletin* of the Commission. The Mediterranean Railroad, of Italy, submitted an elaborate report by Chevalier J. Silvola, stating that experiments were begun in 1879 on the Pontedecimo-Busalla line, which were so successful that the water jet was applied to 35 eight-coupled locomotives used on the heavy grades of that line. This resulted in a considerable saving, the expenditure for sand having been $4,000 a year, while the cost of the steam or water jet was only about $500. An incidental advantage was the absence of the sand, which at one time proved a serious obstacle in the way of maintaining good drainage in the Giovi Tunnel.

The further opinion is advanced that, while the adhesion is not increased quite so much by the use of water as of sand, the water jet system has the advantage in that it does not interpose any resistance to the movement of the train, as does the sand, more or less of which remains on the rails. The engine drivers much prefer the water jet system, as they say it makes the train lighter—that is, it draws more easily. It is stated also that the abandonment of the use of sand is accompanied by a lessening of the wear of rails. This result is supported by numerous observations, and is further corroborated by the observations of M. Couard on the Sorderettes Tunnel of the Paris, Lyons & Mediterranean Railroad and those of M. Egger on the Swiss Central Railroad. The water jet system, it has been said, will not answer in cold climates, but it has been very successful on the Swiss Central and Gothard lines, both of which are subject to very low temperatures. The Gothard railroad has 55 locomotives fitted with the water jet, and thoroughly approves the system. On this road, although there are long tunnels and steep grades, making the use of heavy locomotives necessary, the wear of the rails has been much lighter than was expected. The results so far obtained justify the making of extended experiments with the water jet system, in the opinion of the commission.

The British Army Rifle.

According to Sir Henry Halford, the new army rifle is to have a very small bore, about 0·3 inch, and will be a repeating rifle, with a magazine holding 10 shots. Owing to the reduction of bore, each soldier will be able to carry 166 rounds into action as easily as 100 rounds of the present ammunition. The trajectory of the arm will be very flat, so that, it is expected, as good shooting will be made at 1,000 yards with the new rifle as was made at 600 yards with the Martini-Henry, and at the same the recoil will be reduced to one-third that of the present arm.