MIMICRY AMONG ANIMALS.

Mimicry and Other Protective Resemblances Among Animals.

[Continued from yesterday's Evening Telegraph.]

As it is among butterflies that instances of mimicry are most numerous and most striking, an account of some of the more prominent examples in this group will first be given. There is in South America an extensive family of these insects, the Heliconidæ, which are in many respects very remarkable. They are so abundant and characteristic in all the woody portions of the American tropics, that in almost every locality they will be seen more frequently than any other butterflies. They are distinguished by very elongate wings, body, and antennæ, and are exceedingly beautiful and varied in their colors; spots and patches of yellow red or pure white upon a black, blue, or brown ground, being most general. They frequent the forests chiefly, and all fly slowly and weakly; yet although they are so conspicuous, and could certainly be caught by insectivorous birds more easily than almost any other insects, their great abundance all over the wide region they inhabit shows that they are not so persecuted. It is to be especially remarked also that they possess no adaptive coloring to protect them during repose, for the under side of their wings presents the same, or at least an equally conspicuous, coloring as the upper side; and they may be observed after sunset suspended at the end of twigs and leaves where they have taken up their station for the night, fully exposed to the attacks of enemies, if they have any. These beautiful insects possess, however, a strong pungent semi-aromatic or medicinal odor, which seems to pervade all the juices of their system. When the entomologist squeezes the breast of one of them between his fingers to kill it, a yellow liquid exudes which stains the skin, and the smell of which can only be got rid of by time and repeated washings. Here we have probably the cause of their immunity from attack, since there is a great deal of evidence to show that certain insects are so disgusting to birds that they will under no circumstances touch them. Mr. Stainton has observed that a brood of young turkeys which greedily eat up all the worthless moths he had amassed in a night's "sugaring," one after another seized and rejected a single white moth which happened to be among them. Young pheasants and partridges which eat many kinds of caterpillars seem to have an absolute dread of that of the common currant moth, which they will never touch, and tomtits, as well as other small birds, appear never to eat the same species. In the case of the Heliconidæ, however, we have some direct evidence to the same effect. In the Brazilian forests there are great numbers of insectivorous birds—as jucamars, trogons, and puff-birds—which catch insects on the wing, and that they destroy many butterflies is indicated by the fact that the wings of these insects are often found on the ground where their bodies have been devoured. But among these there are no wings of Heliconidæ, while those of the large showy Nymphalidæ, which have a much swifter flight, are often met with. Again, a gentleman who has recently returned from Brazil, stated at a meeting of the Entomological Society that he once observed a pair of puff-birds catching butterflies, which they brought to their nest to feed their young; yet during half an hour they never brought one of the Heliconidæ, which were flying lazily about in great numbers, and which they could have captured more easily than any other. It was this circumstance that led Mr. Bolt to observe then so long, as he could not understand why the most common insects should be altogether passed by. Mr. Bates also tells us that he never saw them molested by lizards or predacious flies, which often pounce on other butterflies.

If, therefore, we accept it as highly probable (if not proved) that the Heliconidæ are very greatly protected from attack by their peculiar odor and taste, we find it much more easy to understand their chief characteristics — their great abundance, their slow flight, their gaudy colors, and the entire absence of protective tints on their under surfaces. This property places them somewhat in the position of those curious wingless birds of oceanic islands, the dodo, the apteryx, and the moas, which are with great reason supposed to have lost the power of flight on account of the absence of carnivorous quadrupeds. Our butterflies have been protected in a different way, but quite as effectually; and the result has been that as there has been nothing to escape from, there has been no weeding out of slow flyers, and as there has been nothing to hide from, there has been no extermination of the bright-colored varieties, and no reservation of such as tended to assimilate with surrounding objects.

Now let us consider how this kind of protection must act. Tropical insectivorous birds very frequently sit on dead branches of a lofty tree, or on those which overhang forest paths, gazing intently around, and darting off at intervals to seize an insect at a considerable distance, which they generally return to their station to devour. If a bird began by capturing the slow-flying, conspicuous Heliconidæ, and found them always so disagreeable that he could not eat them, he would, after a very few trials, leave off catching them at all; and their whole appearance, form, coloring, and mode of flight is so peculiar that there can be little doubt birds would soon learn to distinguish them at a long distance, and never waste any time in pursuit of them. Under these circumstances, it is evident that any other butterfly of a group which birds were accustomed to devour, would be almost equally well protected by closely resembly a Heliconia externally, as if it acquired also the disagreeable odor; always supposing that there were only a few of them among a great number of the Heliconias. If the birds could not distinguish the two kinds externally, and there were on the average only one eatable among fifty uneatable, they would soon give up seeking for the eatable ones, even if they knew them to exist. If, on the other hand, any particular butterfly of an eatable group acquired the disagreeable taste of the Heliconias while it retained the characteristic form and coloring of its own group, this would be really of no use to it whatever; for the birds would go on catching it among its eatable allies (among whom, we suppose, it is comparatively rare), and it would probably be wounded and disabled, even if rejected, and would be as effectually killed as if it were devoured. It is important, therefore, to understand that if any one genus of an extensive family of eatable butterflies were in danger of extermination from insect-eating birds, and if two kinds of variation were going on among them, some individuals possessing a slightly disagreeable taste, others a slight resemblance to the Heliconidæ, this latter quality would be much more valuable than the former. The change in flavor would not at all prevent the variety from being captured as before, and it would most certainly be thoroughly disabled before being rejected. The approach in color and form to the Heliconidæ, however, would be at the very first a positive, though perhaps a slight advantage; for although at short distances this variety would be easily distinguished and devoured, yet at a longer distance it might be mistaken for one of the uneatable group, and so be passed by and gain another day's life, which might in many cases be sufficient for it to lay a quantity of eggs and leave a numerous progeny, many of which would inherit the peculiarity which had been the safeguard of their parent.

Now, this hypothetical case is exactly realized in South America. Among the white butterflies forming the family Pieridæ (many of which do not greatly differ in appearance from our own cabbage butterflies) is a genus of rather small size (Leptalis); some species of which are white like their allies, while the larger number exactly resemble the Heliconidæ in the form and coloring of the wings. It must be always remembered that these two families are as absolutely distinguished from each other by structural characters as are the carnivora and the ruminants among quadrupeds, and that an entomologist can always distinguish the one from the other by the structure of the feet, just as certainly as a zoologist can tell a bear from a buffalo by the skull or by a tooth. Yet the resemblance of a species of the one family to another species in the other family was often so great, that both Mr. Bates and Mr. Wallace were many times deceived at the time of capture, and did not discover the distinctness of the two insects till a closer examination detected their essential differences. During his residence of eleven years in the Amazon Valley, Mr. Bates found a number of species or varieties of Leptalis, each of which was a more or less exact copy of one of the Heliconidæ of the district it inhabited; and the results of his observations are embodied in the paper published in the "Linnæan Transactions," in which he first explained the phenomena of "mimicry" as the result of natural selection, and showed its identity in cause and purpose with protective resemblance to vegetable or inorganic forms.

The imitation of the Heliconidæ by the Leptalides is carried out to a wonderful degree in form as well as in coloring. The wings have become elongated to the same extent, and the antennæ and abdomen have both become lengthened, to correspond with the usual condition in which they exist in the former family. In coloration there are several types in the different genera of Heliconidæ. The genus Mechanitis is generally of a rich semi-transparent brown, banded with black and yellow; Methona is of large size, the wings transparent like horn, and with black transverse bands; while the delicate Ithomias are all more or less transparent, with black veins and borders, and often with marginal and transverse bands of orange red. These different forms are all covered by the various species of Leptalis, every band and spot and tint of color, and the various degrees of transparency, being exactly reproduced. As if to derive all the benefit possible from this protective mimicry, the habits have become so modified, that the Leptalides generally frequent the very same spots as their models, and have the same mode of flight; and as they are always very scarce (Mr. Bates estimating their numbers at about one to a thousand of the group they resemble), there is hardly a possibility of their being found out by their enemies. It is also very remarkable that in almost every case the particular Ithomias and other species of Heliconidæ which they resemble, are noted as being very common species, swarming in individuals, and found over a wide range of country. This indicates antiquity and permanence in the species, and is exactly the condition most essential both to aid in the development and to increase the utility of the resemblance.

But the Leptalides are not the only group who have prolonged their existence by imitating the great protected group of Heliconidæ; a genus of quite another family of most lovely small American butterflies, the Erycinidæ, and three genera of diurnal moths, also present species which often mimic the same dominant forms, so that some, as Ithomia ilerdina of St. Paulo, for instance, have flying with them a few individuals of three totally different insects, which are yet disguised with exactly the same form, color, and markings, so that all four are undistinguishable when on the wing. Again, the Heliconidæ are not the only group that are imitated, although they are the most frequent modes.

In other parts of the world an exactly parallel series of facts have been observed. The Danaidæ and the Acræidæ of the Old World tropics form, in fact, one great group with the Heliconidæ. They have the same general form, structure, and habits; they possess the same protective odor, and are equally abundant in individuals, although not so varied in color, blue and white spots on a black ground being the most general pattern. The insects which mimic these are chiefly Papilios and Diademæ, a genus allied to our peacock and tortoise-shell butterflies.

Passing on to India, we have Danais tytia, a butterfly with semi-transparent bluish wings and a border of rich, reddish brown. This remarkable style of coloring is exactly reproduced in Papilio agestor and in Diadema nama, and all three insects not unfrequently come together in collections made at Darjeeling. In the Philippine Islands the large and curious Idea leuconoe, with its semi-transparent white wings, veined and spotted with black, is copied by the rare Papilio idæodes from the same islands.

In the Malay archipelago the very common and beautiful Euplæa midamus is so exactly mimicked by two rare Papilios (P. paradoxa and P. ænigma) that Mr. Wallace generally caught them under the impression that they were the more common species; and the equally common and even more beautiful Euplæa rhadamanthus, with its pure white bands and spots on a ground of glossy blue and black, is reproduced in the Papilio caunus. Here also there are species of Diadema, imitating the same group in two or three instances; but we shall have to adduce these further on in connection with another branch of the subject.

It has been already mentioned that in South America there is a group of Papilios which have all the characteristics of a protected race, and whose peculiar colors and markings are imitated by other butterflies not so protected. There is just such a group also in the East, having very similar colors and the same habits, and these also are mimicked by other species in the same genus not closely allied to them, and also by a few of other families. Papilio hector, a common Indian butterfly of a rich black color spotted with crimson, is so closely copied by Papilio romulus, that the latter insect has been thought to be its female. A close examination shows, however, that it is essentially different, and belongs to another section of the genus.

Almost all these cases of mimicry are from the tropics, where the forms of life are more abundant, and where insect development especially is of unchecked luxuriance; but there are also one or two instances in temperate regions. In North America the large and handsome red and black butterfly Danais erippus is very common; and the same country is inhabited by Limenitis archippus, which closely resembles the Danais, while it differs entirely from every species of its own genus.

In the preceding cases we have found Lepidoptera imitating other insects of the same order, and such species only as we have good reason to believe were free from the attacks of many insectivorous creatures; but there are other instances in which they altogether lose the external appearance of the order to which they belong, and take on the dress of bees or wasps—insects which have an undeniable protection in their stings.

The Sesiidæ and Egeriidæ, two families of day-fling moths, are particularly remarkable in this respect, and a mere inspection of the names given to the various species shows how the resemblance has struck every one. We have apiformis, vesipiforme, ichneumoniforme, scoliæforme, sphegiforme (bee-like, wasp-like, ichneumon-like, etc.), and many others, all indicating a resemblance to stinging Hymenoptera. In Britain, we may particularly notice Sesia bombiliformis, which very closely resembles the male of the large and common humble-bee, Bombus hortorum; Sphecia craboniforme, which is colored like a hornet, and is (on the authority of Mr. Jenner Weir) much more like it when alive than when in the cabinet, from the way in which it carries its wings; and the little currant clear-wing Trochilium tipuliform resembles a small black wasp (Odynerus sinuatus) very abundant in gardens at the same season. It has been so much the practice to look upon these resemblances as mere curious analogies, playing no part in the economy of nature, that we have scarcely any observations of the habits and appearance when alive of the hundreds of species of these groups in various parts of the world, or how far they are accompanied by Hymenoptera, which they specifically resemble. There are many species in India (like those figured by Professor Westwood in his "Oriental Entomology"), which have the hind legs very broad and densely hairy, so as exactly to imitate the brush-legged bees (Scopulipedes) which abound in the same country. In this case we have more than mere resemblance of color, for that which is an important functional structure in the one group is imitated in another whose habits render it perfectly useless.

It may fairly be expected that if these imitations of one creature by another really serve as a protection to weak and decaying species, instances of the same kind will be found among other groups than the Lepidoptera; and such is the case, although they are seldom so prominent or so easily recognized as those already pointed out as occurring in that order. A few interesting examples may, however, be pointed out in most of the other orders of insects. The Coleoptera or beetles that imitate other Coleoptera of distinct groups are very numerous in tropical countries, and they generally follow the laws already laid down as regulating these phenomena. The insects which others imitate always have a special protection, which leads them to be avoided as dangerous or uneatable by small insectivorous animals; some have a disgusting taste (analogous to that of the Heliconidæ); others have such a hard and stony covering that they cannot be crushed or digested; while a third set are very active, and armed with powerful jaws, as well as having some disagreeable secretion. Some species of Eumorphidæ and Hispidæ, small flat or hemispherical beetles which are exceedingly abundant, and have a disagreeable secretion, are imitated by others of the very distinct group of Longicornes (of which our common musk-beetle may be taken as an example). The extraordinary little Cyclopeplus batesii belongs to the same sub-family of this group as the Onychocerus scorpio and O. concentricus, which have already been adduced as imitating with such wonderful accuracy the bark of the trees they habitually frequent; but it differs totally in outward appearance from every one of its allies, having taken upon itself the exact shape and coloring of a globular Corynomalus, a little stinking beetle with clubbed antennæ. It is curious to see how these clubbed antennæ are imitated by an insect belonging to a group with long slender antennæ. The sub-family Anisocerinæ, to which Cyclopeplus belongs, is characterized by all its members possessing a little knob or dilatation about the middle of the antennæ. This knob is considerably enlarged in C. batesii, and the terminal portion of the antennæ beyond it is so small and slender as to be scarcely visible, and thus an excellent substitute is obtained for the short clubbed antennæ of the Corynomalus. Erythroplatis corallifer is another curious broad flat beetle, that no one would take for a Longicorn, since it almost exactly resembles Cephalodonta spinipes, one of the commonest of the South American Hispidæ; and what is still more remarkable, another Longicorn of a distinct group, Streptolabis hispoides, was found by Mr. Bates, which resembles the same insect with equal minuteness—a case exactly paralleled to that among butterflies, where species of two or three distinct groups mimicked the same Heliconia. Many of the soft-winged beetles (Malacodermes) are excessively abundant in individuals, and it is probable that they have some similar protection, more especially in other species often strikingly resemble them. A Longicorn beetle, Peciloderma terminale, found in Jamaica, is colored exactly in the same way as a Lycus (one of the Malacodermes) from the same island. Eroschema poweri, a Longicorn from Australia, might certainly be taken for one of the same group, and several species from the Malay Islands are equally deceptive. In the Island of Celebes is found one of this group, having the whole body and elytra of a rich deep blue color, with the head only orange; and in company with it an insect of a totally different family (Eucnemidæ), with identically the same coloration, and of so nearly the same size and form as to completely puzzle the collector on every fresh occasion of capturing them.

There are a number of the larger tropical weevils which have the elytra and the whole covering of the body so hard as to be a great annoyance to the entomologist, because, in attempting to transfix them, the points of his pins are constantly turned. We have found it necessary in these cases to drill a hole very carefully with the point of a sharp penknife before attempting to insert a pin. Many of the fine long-antennæed Anthribidæ (an allied group) have to be treated in the same way. We can easily understand that, after small birds have in vain attempted to eat these insects, they should get to know them by sight, and ever after leave them alone, and it will then be an advantage for other insects which are comparatively soft and eatable to be mistaken for them. We need not be surprised, therefore, to find that there are many Longicorns which strikingly resemble the "hard beetles" of their own district. In South Brazil, Acanthotritus dorsalis is strikingly like a Curculio of the hard genus Heliplus, and Mr. Bates assures us that he found Gymnocerus cratosomoides (a Longicorn) on the same tree with a hard Cratosomus (a weevil), which it exactly mimics. Again, the pretty Longicorn Phacellocera batesii mimics one of the hard Anthribidæ of the genus Ptychoderes, having long slender antennæ. In the Moluccas, we find Cacia anthriboides, a small Longicorn which might be easily mistaken for a very common species of Anthribidæ found in the same districts; and the very rare Capnolymmr stygium closely imitates the common Mecocerus gazella, which abounded where it was taken. Doliops curculionides and other allied Longicorns from the Philippine Islands most curiously resemble, both in form and coloring, the brilliant Papyrhynchi—Curculionidæ, which are almost peculiar to that group of islands. The remaining family of Coleoptera most frequently imitated is the Cicindelidæ. The rare and curious Longicorn, Collyrodes lacordairei, has exactly the form and coloring of the genus Collyris, while an undescribed species of Heteromera is exactly like a Therates, and was taken running on the trunks of trees, as is the habit of that group. There is one curious example of a Longicorn mimicking a Longicorn, like the Papilios and Heliconidæ, which mimic their own allies. Agnia fasciata, belonging to the sub-family Hypselominæ, and Nemophas grayi, belonging to the Lamiinæ, were taken in Amboyna on the same fallen tree at the same time, and were supposed to be the same species till they were more carefully examined, and found to be structurally quite different. The coloring of these insects is very remarkable, being rich steel-blue black, crossed by broad hairy bands of orange-buff, and out of the many thousands of known species of Longicorns they are probably the only two which are so colored. The Nemophas grayi is the larger, stronger, and better armed insect, and belongs to a more widely spread and dominant group, very rich in species and individuals, and is therefore most probably the subject of mimicry by the other species.

We will now adduce a few cases in which beetles imitate other insects, and insects of other orders imitate beetles.

Charis melipona, a South American Longicorn of the family Necydalidæ, has been so named from its resemblance to a small bee of the genus Melipona. It is one of the most remarkable cases of mimicry, since the beetle has the thorax and body densely hairy like the bee, and the legs are tufted in a manner most unusual in the order Coleoptera. Another Longicorn, Odontocera odyneroides, has the abdomen banded with yellow, and constricted at the base, and is altogether so exactly like a small common wasp of the genus Odynerus, that Mr. Bates informs us he was afraid to take it out of his net with his fingers for fear of being stung. Had Mr. Bates' taste for insects been less omnivorous than it was, the beetle's disguise might have saved it from his pin, as it had no doubt often done from the beak of hungry birds. A larger insect, Sphecomorpha chalybea, is exactly like one of the large metallic blue wasps, and like them has the abdomen connected with the thorax by a pedicel, rendering the deception most complete and striking. Many eastern species of Longicorns of the genus Oberea, when on the wing exactly resemble Tenthredinidæ, and many of the small species of Hesthesis run about on timber, and cannot be distinguished from ants. There is one genus of South American Longicorns that appears to mimic the shielded bugs of the genus Scutellera. The Gymnocerus capucinus is one of these, and is very like Pachyotris fabricii, one of the Scutelleridæ. The beautiful Gymnocerus dulcissimus is also very like the same group of insects, though there is no known species that exactly corresponds to it; but this is not to be wondered at, as the tropical Hemiptera have been comparatively so little cared for by collectors.

The most remarkable case of an insect of another order mimicking a beetle is that of the Condylodera tricondyloides, one of the cricket family from the Philippine Islands, which is so exactly like a Tricondyla (one of the tiger beetles), that such an experienced entomologist as Professor Westwood placed it among them in his cabinet, and retained it there a long time before he discovered his mistake! Both insects run along the trunks of trees, and whereas Tricondylas are very plentiful, the insect that mimics it is, as in all other cases, very rare. Mr. Bates also informs us that he found at Santarem on the Amazon a species of locust that mimicked one of the tiger beetles of the genus Odontocheila, and was found on the same trees which they frequented.

[*Conclusion To-morrow.*]

PROPOSALS.

IMPROVEMENT OF THE DES MOINES RAPIDS OF THE MISSISSIPPI RIVER.
U. S. ENGINEER'S OFFICE,
DAVENPORT, Iowa, July 24, 1867.
Sealed proposals, in duplicate, will be received at this office until 12 M., WEDNESDAY, September 4, 1867, for excavating the prism and constructing the embankment wall of the Canal for the improvement of the navigation of the Mississippi river at the Des Moines Rapids.
The Canal is to be about 7½ (seven and one-half) miles long, extending from Nashville to Keokuk, Iowa. The width at the water surface inside the canal to be 300 (three hundred) feet in embankment, and 250 (two hundred and fifty) feet in excavation, and in low water to be 5 (five) feet deep. All the material excavated from the prism of the canal to be used in building the embankment. The latter throughout the greater part of the distance will be about 300 (three hundred) feet from the Iowa shore. Where rock excavation occurs, the bottom of the canal will have a slope of 1½ (one and one-half) inches to the mile. The embankment is to be built of earth clay and rock; to be 10 (ten) feet wide on top, including the rip-rap covering; to be 2 (two) feet above high-water mark, with slopes of 1½ (one and one-half) base to 1 (one) vertical. The average thickness of the rip-rap protection to be 2½ (two and one-half) feet on the river side, 2 (two) feet on the canal side, and 1 (one) foot on top.
All propositions must state the price at which each and every kind of work specified in the proposal is to be done, and no bid will be considered that is not definite in this respect.
The Government reserves the right to reject any and all bids.
A printed copy of this advertisement must be attached to each proposal.
Each bid must contain a written or printed guarantee signed by two responsible persons.
Blanks for proposals of the form required, with form of guarantee, will be furnished at this office on application.
The price or prices in the contract will be considered as including the expense of furnishing all the materials and performing all the work, according to the plans and specifications exhibited at the letting.
The entire cost of the canal is estimated at $2,068,345 (two million sixty-eight thousand three hundred and forty-five). The amount appropriated by Congress is $700,000 (seven hundred thousand dollars)—the contract can only be made to cover this amount.
Fifteen (15) per cent. of the amount of any work done or materials furnished, at the contract price thereof, will be reserved until the whole work which is the subject of contract shall be entirely completed.
Persons desiring further information can obtain the same by calling at this office, where maps, plans, specifications, and form of contract can be consulted.
Proposals must be addressed to the undersigned, and should be endorsed "Proposals for work on the improvement of the Des Moines Rapids."
J. H. WILSON,
Lieut.-Col. 35th Infantry,
7 30 4w Bvt. Major-General U. S. Army.

PROPOSALS FOR A NEW JAIL.
DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C., July 31, 1867.
Sealed proposals will be received at this Department until 12 o'clock M., on TUESDAY, the 17th of September, 1867, for the erection of the Jail in and for the District of Columbia, authorized and provided for by the act of Congress, approved July 25, 1866, and the joint resolution approved March 2, 1867.
The designs, detail, drawings, and specifications can be seen at the architect's office, in the eastern grounds of the Capitol, Washington city, every day, except Sundays, between the hours of 9 A. M. and 3 P. M.
Separate bids will be received for the masonry work, brick work, iron work, and carpentry work.
The contractor whose bid may be accepted will be required to enter into a sufficient bond, to be approved by the Secretary of the Interior, for the faithful completion of his contract. Payments will be made as the work progresses, on estimates certified to by the architect; but twenty per centum of the estimates will be retained until the contract is completed.
The contract will be awarded to the lowest responsible bidder, but the Department reserves the right to reject any or all of the bids should it be deemed for the interest of the Government to do so.
The bids will be opened at noon on the 18th day of September next, in presence of such of the bidders as may choose to attend.
Proposals should be endorsed on the envelope "Proposals for New Jail," and be directed to the "Secretary of the Interior, Washington, D. C."
O. H. BROWNING,
8 21 t9 17 Secretary of the Interior.

PHILADELPHIA DEPOT.
ASSISTANT QUARTERMASTER'S OFFICE,
No. 1139 GIRARD STREET,
PHILADELPHIA, August 19, 1867.
Proposals will be received at this office until 12 o'clock M., SATURDAY, August 24th, 1867, to restore to its original condition eleven hundred and fifteen (1115) feet, more or less, of "Willow Grove Avenue," Chesnut Hill, Philadelphia, on the grounds formerly occupied by the United States Government in connection with the "Mower" Hospital.
Each bid must be guaranteed by two responsible persons, whose signatures must be appended to the bid, and certified to as being good and sufficient security for the amount involved, by the United States District Judge, Attorney, Collector, or other public officer.
Blank forms for bids can be had on application at this office, and bidders are requested to be present at the opening of the same.
The right is reserved to reject any bid deemed too high, and no bid from a defaulting contractor will be received.
Endorse envelopes, "Proposals for Repairs to Willow Grove avenue."
By order of Brevet Major-General G. H. Crosman, Assistant Quartermaster-General, United States Army,
HENRY W. JANES,
Captain and Assistant Quartermaster,
8 19 5t Brevet Lieutenant-Colonel, U. S. A.

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