

A COLONY OF SOLITARY WASPS (HYMENOPTERA: CHLORIONINI)

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The nesting habits of the Great golden digger (*Chlorion ichneumoneum* L.) have been studied to some extent by a number of observers, particularly by Prof. and Mrs. G. W. Peckham of Milwaukee, Wisconsin. Others have added to these observations, though less fully, so that a general idea of the nesting habits of this species has been obtained.

To this knowledge are here added some facts concerning a group of these insects which appeared in a small area many years ago. Although this location is seemingly very far from desirable, the wasps, probably descendants of the original ones, have been using it ever since.

About twenty-five years ago, while living in Amherst, Massachusetts, I received word from a lady living a few miles away that there was a colony of these wasps nesting at one side of her house. This lady had been for some years a neighbor of Professor and Mrs. Peckham at Milwaukee and had followed their studies with much interest and so was quite familiar with these wasps.

As the location of these nests seemingly was most unfavorable for these insects to select, I visited it at once and for a number of years thereafter, often several times during a season. So undesirable was it as to call for further description.

The house, then over seventy-five years old, stands on a rather high ridge overlooking the Connecticut River valley for a distance of many miles to the north and is much exposed to high winds, very cold in winter, which sweep down over the valley. It is a long house, extending east and west, its north side without any protection from these winds. The main house faces the east, followed by a narrower ell and a shed. The ell and shed are even with the north side of the main house but narrower on the southern side. Close to the south side of the main house is a road, thus leaving between the ell and shed and this road a strip of ground about fifteen feet wide and about twenty-five feet long and this strip the wasps had taken for their nesting place.

The house had been built upon glacial till and the earth in the nesting area apparently had never been disturbed since the erection of the house. The till consisted of both small and large stones, some of them two or three inches in diameter with a little finer soil between them. This ground had become so compacted by remaining undisturbed for over half a century that a shovel or trowel had no effect upon it and its excavation without a pick was possible only by using a heavy knife, digging it out a bit at a time. Scattered tufts of grass failed to cover the ground entirely leaving a considerable part of the surface as bare ground with the uppermost stones showing. A more unfavorable place for wasps to make their nests could hardly be imagined.

Why this location was selected by the wasps can only be guessed, but it seems possible that it was chosen because the strong winds which sweep by are shut off at least in part by the house, also it is protected from the cold in winter, and is directly exposed to the heat of the sun in summer. Perhaps these advantages outweighed the difficulty in digging the holes for the nests.

Not all of the area available was used by the wasps. No holes were nearer than six feet to the buildings. The distances between the holes varied from about five inches to several feet and perhaps were determined by the impossibility of digging them in some places because of too large stones there. This was evidenced by some of the holes examined, going down an inch or two and ending at a large stone. The completed holes varied from about three to four inches or a little more in depth and this difference too may have been determined by finding an immovable stone at the end of the shallower holes. Apparently the wasps considered that a hole less than three inches deep did not give sufficient protection to their young during the winter.

That the insects struggled valiantly in digging these holes was shown by one wasp which after getting down about two inches evidently found in its way a stone composed of thin strata each layer about an eighth of an inch thick, almost truly oval in outline, about an inch across at its widest part and an inch and a half long. The stone evidently had been ground into this shape by glacial action and had weathered enough so that the strata composing it were no longer firmly adherent and the wasp when first seen had what was probably the middle layer of the stone in her jaws and walking backward was dragging it out of the hole on one edge. As this piece of stone was higher at its middle than the insect it was an interesting sight to watch her as she struggled to pull it out.

At the time the colony was first visited there were from fifteen to twenty wasps at work, some digging holes, others stocking them with prey. As the season advanced more seemed to be present, but as some were coming and others going out for their prey, it was not possible to be sure of the actual number present.

Digging began in July, the date varying with the advancement of the season each year, and continued well into September and in a few cases into early October.

Excavation of the holes showed them generally to consist of an end chamber and a side one and the angle of the tunnel itself with the surface of the ground varied considerably, this perhaps being determined by the stones encountered during the digging.

After the hole—which sometimes took three days to excavate, the ground being so firm and stony—was completed, the wasp would circle around it several times and then would fly away in search of its prey, in this case the Tettigoniid, *Neoconocephalus ensiger* (Harris). In the early part of the season these were nymphs from one-third to one-half grown and several were placed in a chamber. Later, as they became larger, their number became less and when the adults appeared one only was sufficient though in a few cases two were found in a chamber. The egg of the wasp was nearly always placed on the lower left side of the body, close to the articulation of the middle leg, but in one case it was attached to the labium!

It was noticed that the wasps coming in with their prey all came from one direction and a search in that region for a distance of nearly a quarter of a mile was made to find where these Tettigoniids were located, but not one of these insects was discovered even by most careful searching. Either the searchers were poor hunters or the wasps flew quite long distances with their prey. Approaching the nesting area the wasp, holding its prey in its jaws and fore legs and sometimes with its middle legs also, would fly to within two or three feet of its own hole before alighting, and appeared to have no difficulty in finding it among the others.

At some times during a season there appeared to be between twenty-five and thirty wasps active at the same time. One summer, though, only about half a dozen seemed to be at work. The preceding winter had been a severe one with one or two short, warmer spells and it is possible that some of the insects more exposed than the others (in shallower holes?) had been killed by the winter weather. Two or three of the following seasons, however, seemed to be sufficient to bring the insects back to their normal abundance.

Some of the wasps after the main group had been established for several years, started another of perhaps six to ten members just across the road referred to above where the ground was less stony but more exposed to winter conditions. This group did not maintain itself for more than a few years.

My removal from this locality prevented further observations but the present owner of the place, Mr. R. H. Whitcomb, has supplied the following data as to present conditions.

In 1943 the wasps were still present though in reduced numbers, only a few having been observed though regular examinations of the place were not possible for lack of time. He writes that about 11:45 A. M., August 31, one of the wasps was digging a hole and that another one was trying to start a hole of its own in the sand pile thrown out by the first one about four inches from the first hole. This aroused the ire of the first wasp which tried to drive the second one away. This action was repeated several times. Finally the owner of the sand pile attacked the intruder savagely, the two rolling around over the ground, kicking and fighting, for about half a minute, after which the second wasp flew away. At 2:30 P. M. the first wasp had resumed her digging and then was undisturbed. Perhaps the intruder had found digging in the firm ground too hard work and was delighted to find loose sand available in which to make her hole, not realizing that it was the property of the other wasp to be used to fill her nest when it was ready to close.

Why this group came to locate at this place is, of course, uncertain. Perhaps one wasp started it and her descendants found the location a desirable one despite the nature of the ground. Perhaps, also, the young adults would naturally locate near where they themselves were produced. No other nests of this insect were found in the immediate neighborhood.

In 1945 this colony was still in existence and apparently in good condition.