

and while the State Board of Health uses its best endeavors to obtain inspectors who shall fulfill all the requirements of the ideal inspector, still the limited annual appropriation of ten thousand dollars will not permit of its paying salaries to its inspectors commensurate with the skill and experience demanded. The faulty diagnosis, as evidenced by the *post mortem* examinations amounting thus far to about three percent. of the animals slaughtered, is due not to errors in the principle employed, but to errors in the method, carelessness or ignorance on the part of the user of such principles, and in nowise affects the efficiency of the tuberculin test as a diagnostic agent.

The tuberculin is imported into this country, and although the department in Washington has the formula for its production, still the febrile reaction of the two brands differs. Just what or how the tuberculin is produced is not generally known. It is generally believed to be a ptomaine of the bacilli tuberculosis in pure glycerine.

We will suppose that the owner of a herd of say forty head has, during the past year, unaccountably lost two or three animals. Some of his cows have rough coats, feverish eyes, are thin and low spirited. The milk supply may be normal or even increased. Two or three have a cough, and to sum it up the owner would say his cows are "sick." He hears of consumption among cattle and writes to the State Board of Health at Albany, asking that an examination be made of his cattle at the expense of the State. After waiting several months (we have over fifty applications on file and unattended to), he receives notice that on a certain day the inspector will make an examination. He is asked how long since his cattle first became "sick." Inquiry as to cattle purchased at or before such first sickness will be made, and the chances are more than even that the purchased animal came from a herd known to be tuberculous. The cattle are then numbered, examined physically with much care, and the results entered.

If the facts warrant it, the cattle are thereupon tagged and quarantined. The owner is directed to remove all cows within two weeks of calving, and all cows bulling unless the physical examination clearly shows them to be tuberculous. The reason for this is that the tuberculin test is apt to give undue reactions in such cases and to similarly feed and water his entire remaining herd. One hour after feeding the temperatures of all animals are to be taken by thermometers, the similarity of whose readings under similar changes of temperature the inspector has previously established. He will take temperatures five hours thereafter and again at ten hours. During the interim the cattle are to be neither fed nor watered. Careful entries are to be made of all results so obtained.

He will then order the cattle well fed and watered and will proceed to inoculate the animals with tuberculin, using his judgment as to the amount to be injected, based upon the weight of the animal to be tested. About seven hours thereafter he will again commence taking temperatures and without permitting feeding or watering take eight temperatures at intervals of two hours each, after which the test ceases and the animals may be fed and watered.

Now commences the real work of the inspector and upon which his reputation and the reputation of the board depends. The inspector will remember that temperatures are nearly two degrees lower between twelve and two at night than at midday, that free watering may reduce the temperature one and a half degrees, that a bull has two degrees higher temperature than a cow, and that chewing the cud is certain to run the mercury up at least one degree.

It is trying work, and the tendency is to let the doubtful cases remain under quarantine pending subsequent examination. This, however, is a hardship upon the owner, and should be, so far as possible, discouraged.

Depending upon the results of his study of the chart, he orders some freed from quarantine; some he continues under quarantine, and for some he orders killing cards from the ward in Albany. If the rise is spasmodic, resuming or approximating the normal as the tests continue, other things equal, the animal is non-tuberculous. If there is a gradual and regular rise, reaching its maximum at the seventh or eighth test and showing an increase of upward of three degrees above the normal, the animal is almost certainly tuberculous and should be killed. When received the cattle are killed under his direction and *post mortem* examinations made. The carcass is buried usually in quicklime or removed to a phosphate factory.

It is believed by the board that it as a body cannot alone ever eradicate this disease. The subject is too vast to seriously undertake. It wishes to bring the subject before the people, and let the individual or the local boards in co-operation with the State board attend to the details. It is hopeful that the health departments of cities will appreciate the importance of the subject and issue a quarantine against tuberculous milk. It hopes that in the near future a corps of specialists will be granted from our agricultural and veterinary colleges whose certificate of immunity will be a prerequisite to the possibility of sale, and that the ultimate result will be a material lessening of the death rate and a demand for the animals and dairy products from the State of New York by reason of their known freedom from disease.

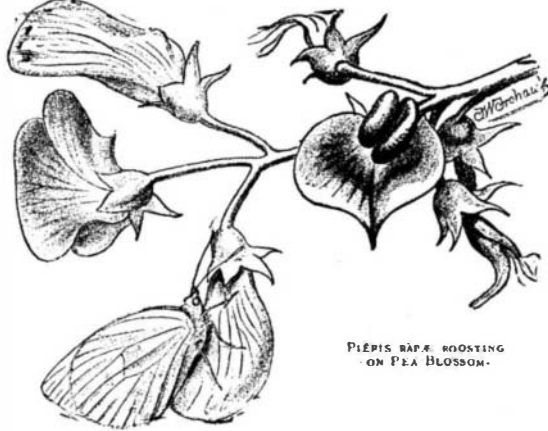
#### ROOSTING BUTTERFLIES.

By JOHN T. CARRINGTON.

CONSIDERING that more than half the span of life allotted by nature to the perfect state of butterflies is spent in sleep, it is of the first consequence that the manner of roosting should be as far as possible protective. Alert and well able to save themselves during the active period of their existence, when the sun is hot and their power of flight is strong, they are perfectly helpless in the dusk of evening, the night time, early morning and on dull days. Then we may pick them up with our fingers and place them on our hands without the slightest show of movement on the part of the insects. When in this condition of torpor or sleep induced by absence of sunlight, butterflies form an easy prey to prowling enemies, which may by chance take them before they have

provided for the continuance of their species. Therefore, we must conclude that the habit of roosting adopted by each kind is most conducive to protection during the long hours of sleep.

When we take the list of the European Rhopalocera and scan it deliberately through, it is only possible to come to one conclusion upon the knowledge possessed as to the manner of roosting of the various butterflies. Indeed, we, in this country, need not take the whole European list if we are in search of discovery into the resting habits of these insects. Very little is really known about the roosting positions, from the protective point of view, of the majority of our British species. Most entomologists know how to hunt for several of our "blues," or Lycaenids. Various kinds are to be found so soon as



PIERIS RAPÆ, ROOSTING ON PEA BLOSSOM.

the sun has set, resting upon the stems of grass; though not all the species affect the same position. Some species invariably rest with the head of the insect turned away from the earth, looking skyward, while other species always roost with the head looking downward. One wonders why nearly allied species, with the markings and ground color of the underside of the wings, which is the only side visible among this group when roosting, should invariably adopt these unlike positions on the stems of grass.

Some of the fritillaries (*Argynnis*) and *Melitæa* often affect the heads of flowers as the night resting place, though I fancy this is rather accidental than otherwise. It may be those frequenting the flowers at night were "caught" in that position by the sun going down while they were feeding off the honey in the flowers, as so often seen with humble bees. We cannot find a large proportion of say *Argynnis euphrosyne* or *Melitæa athalia* out of the total population of these species in any locality affected by them at rest on the flower heads. Still it is not uncommon to find both species in that position on a dull morning after a bright day. I have seen seventy of the latter kind on heads of thistle and other flowers in a single morning, in the great wood near Hailsham, in Sussex. So, likewise, may we find the grizzly skipper at rest, though chiefly on lower growing flower heads. *Hesperia comma* sits upon the smooth stems of young hazel boughs in woods, on the borders of the chalk downs where it flies, and *H. sylvanus* has much the same habit. Another of our skippers, *Nisomides tages*, may be taken in sufficient abundance by searching the dead seed capsules of the plants of black knapweed of the previous year. This species roosts in a

which it closely resembles and mimics both in form and color. It remained motionless until noon on the following day, when the sun shone for a short time, and it flew away. The similarity between the unexpanded blossoms and the resting butterfly was an excellent example of protective resemblance."

About three years ago I was visiting a house well covered with ivy of a variety with rather large leaves. One recently grown branch had developed a few whitish or cream colored leaves, as a "sport" among the ordinary green leaves. This branch being near the dining room window, was convenient for observation. Every evening for several days, about sunset, a large cabbage white butterfly (*Pieris brassicae*) used to search out one of these half dozen white ivy leaves, and roost upon it for the night. The protective value of the creamy white leaf for the creamy white underside of the butterfly was perfect. The butterfly seemed to be the same individual on each evening.

The drawing of some three dozen *Plexippus* butterflies at rest on a dead branch of a shrub is taken from a photograph by Prof. C. F. Nachtrieb, of the Department of Animal Biology, in the United States of America, who lent the picture to *Insect Life*, the excellent journal published by the entomological division of the United States Department of Agriculture, in January, 1893 (vol. v., p. 206). This butterfly is larger than any species native to our islands, so an idea may be gathered of the appearance of the branch as seen by Prof. Nachtrieb. Being in color yellowish orange, with black veins, these roosting butterflies would have the appearance, when seen at a distance, of withered leaves attached to a dead branch.

Without becoming speculative as to how far the power of reason, as apart from instinct, guides, we cannot fail to see how important for the preservation of butterflies is the selection of suitable roosting places during the helpless period of sleeping. — *Science Gossip*.

#### NANSEN'S EXPEDITION TO THE NORTH POLE.

THE remarkably brisk rivalry that has lately developed in the field of polar exploration gives ground for the hope that during the next few years many Arctic discoveries may be made which will be of great importance to science, so that in the near future the map of the North Polar regions will present quite a different picture from that with which we are familiar. The methods employed for conducting such expeditions, to say nothing of the latest scientific discoveries—such as electric light and the phonograph—that lend their aid, have opened a new era in polar explorations. The most notable ones, as far as the expeditions themselves are concerned, which will try to reach the North Pole from many different directions, are the following: The Norwegian expedition of Dr. Fridtjof Nansen, who hopes to reach his goal from the island of New Siberia; the North American expedition of Lieut. Peary, who will push to the north by way of Greenland; and the expedition of the Englishman, Fred. Jackson, who will take Franz Josephsland as the starting point. Besides these, an expedition consisting of eight persons will be sent out from America, for the purpose of exploring unknown Arctic regions. This party, which will be conducted by a German connected with the geological survey of the United States, Robert Stein by name, will go north along the western coast of Grinnell Land, because those who are supposed to know about such matters claim that the best route to the extreme north is along a stretch of western coast which extends to the pole. In connection with polar explorers we may mention the Norwegian, Martin Eckroll, a wealthy merchant of Lofoten, who is greatly in-



ANOSIA PLEXIPPUS, ROOSTING.

position quite unlike others of the group native to these islands. It folds its wings under the body, like a noctuid moth. On one evening, on the Horsley Sheep Lees in Surrey, I searched a dead plant of knapweed for varieties of this dingy skipper butterfly and took sixteen specimens off about ten seed heads. Being unable to find more, I shook the plant into my entomological net, with the result that four additional butterflies were shaken off. The protective position selected was so perfect that all my trained experience failed to show me the remaining four on the plant.

I quote Mr. F. W. Frohawk's notes, taken when he sketched the white butterfly sleeping on a pea flower, herein reproduced from his drawing.

"August 19, 1885, between 10 and 11 A. M., dull day, found *Pieris rapae*, female, at rest on pea blossom,

interested in Arctic expeditions, and has a theory that a so-called sledge boat, drawn by a number of dogs, could go over the ice from Spitzbergen to Franz Josephsland, and from there over the North Pole to the eastern coast of Greenland.

The polar expeditions mentioned, with the exception of the first two, will start next year. The Peary expedition, consisting of ten persons, started last summer, in the sealing boat Falcon, for Whale Sound, in the northern part of the western coast of Greenland, where the expedition will winter. In the spring the expedition will start by the route followed by the former Peary expedition over the inland ice to Independence Bay—shown in the accompanying map—and when this point is reached, they will divide into groups, one of which will be led northward by Lieut. Peary, while another will explore the unknown coast from Ia-