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in attendance. The teacher thus has to teach about thirty lessons in the six hours of school work, and each pupil gets just one-sixth or one-seventh of the attention that he ought to get and would undoubtedly get in a school which had one teacher for each grade.

The cost of conducting the combined school is less, indeed much less than it would be to carry on the tiny, ungraded schools with small attendance. The upkeep of the consolidated school, once built, would be less, as the heating cost alone would be so much less that the money saved would be interest on a considerable amount of capital. The purely educational cost then is less than for the maintenance of a larger number of ungraded schools. But there still remains the cost of transporting the pupils from their homes to the consolidated school. Naturally the distance is greater than in the former cases, and the difficulty must be overcome by providing some form of public or private transportation. Wherever the roads are numerous and good, the site for a consolidated school should be at the centre of a number of intersecting roads. Usually a village is so placed, and if possible a village should be selected, for the school will then be easy of access, conveniently near shopping centres and the church, and may become a suitable centre for community social events. In one actual case the school is the post office, public library and town hall, but then this is almost ideal and is not to be expected suddenly as the prevailing type, though possibly it may be accepted as some sort of ideal towards which one form of consolidated school should grow.

In some parts of the Western United States and in our prairie provinces, the children arrive at school on their own ponies in the family sleigh or wagon. There are stable facilities and carriage sheds for such private cases. In other instances, public conveyance is provided at the expense of the school district in the shape of large vans in summer and sleighs in winter. Sometimes these are the property of the school, and sometimes of the contractor. The contract is let by tender and is paid for by the month. Routes are arranged for, and parents bring the children to the nearest point of the route and return for them at night. Where this is in force it sometimes costs as high as \$75 a month when the contractor provides his own wagon, and sometimes \$55 a month when it belongs to the school trustees. This, however, when spread over twelve or fifteen or more children only averages five dollars a month—a sum which many city children are obliged to pay in cities for their street car fares.

However, there is no disguising the fact that the only expensive point in connection with consolidated schools is public transportation by van or sleigh. Otherwise the saving of expense is considerable, and when one contemplates the benefits due to larger attendance, regularity of attendance, better grading, better teachers and more efficiency generally, the disadvantage of transportation is outweighed by the advantage of better schooling, more social mixing, greater companionship and competition, and more progress in studies.

The transportation difficulty should not prove an insuperable one to farmers, for they have to arrange for the transportation of their milk and cream daily to the factory. The milk cannot walk even in good weather, so producers arrange for a common wagon to cover a district route. Unfortunately children can be made to walk considerable distances in good weather, and have to do so to reach our present rural schools. In winter or in stormy weather they cannot walk and so are kept at home, to the detriment of their education and the ruin of the school's efficiency. Rural school attendance is always poor, but consolidated schools which have transportation as part of the system have solved the problem of regular attendance, as children can attend in comfort, ease and without fatigue whether the weather is foul or fair. In some cases the average daily attendance is 90 per cent. of the enrolment, whereas even in some city schools 75 per cent. is considered a very good average.

There is no gainsaying the advantage of a consolidated school, and as our present scattered rural schools are a century behind the times they are bound to be cast aside, just as the tallow dip, the hoe, and the flail have disappeared before the electric light, the cultivator and the reaping, binding and threshing machines. The well-known shrewdness of our farmers, who like to get value for money, has not been exhibited in their attitude to rural school problems. Perhaps their bargaining instinct is the obstacle which prevents them from perceiving the great though invisible advantage of better schools for their children. This advantage is not immediately seen, but would soon prevent many of our rural dwellers seeking the city in search of better educational facilities for their families.

From this point of view it is impossible to reform our rural schools. What we have to do is to work for their complete reorganization. We need a real revolution and not a compromise or temporary reform which would be merely temporary and superficial.

Under the editorial heading "The Next Army Making" it is encouraging to find in the Toronto Mail and Empire the conviction emphasized that the supreme task of the future will be "the remoulding of soldiers into industrial workers still more efficient than they have been as warriors."

### Nature's Diary.

A. B. KLUGH, M. A.

Among the caterpillars of moths there are many peculiar forms, but few are more bizarre than the larva of the White-marked Tussock Moth. This caterpillar is so quaint and beautiful that we cannot help admiring it in spite of its destructiveness. The head of this larva is bright coral red. At the head end are a pair of long, black, plume-like tufts, and at the opposite end of the body is a single tuft of dark chestnut tipped with black. On the back are four white, or pale yellowish, dense, brush-like tufts. The arrangement and relative lengths of these two kinds of tufts is shown in our illustration. Along the back, except in the region occupied by the white tufts, is a black line, and in the centre of this, on the sixth and seventh segments of the



Larva of White Marked Tussock Moth.

abdomen, are two red projections. Below this black line is a yellow stripe, and below this a pearl gray stripe, bordered beneath by a fine black line. Below this line is a pale yellow stripe. The under surface is pale green, truly a remarkable and beautifully blended color-scheme.

The surface of the body is covered with long bristly hairs, and these in addition to the tufts render the larva a very hairy object. These hairs are of service in protecting it from the attacks of birds as many species of birds have a decided objection to hairy larvæ, and most of those even which feed on hairy caterpillars themselves select smooth ones to feed to their young.

This caterpillar feeds on the leaves of trees, and while the Maples, Basswood, Horse-chestnut and Elm are the trees which suffer most from its depredations, it also sometimes attacks the Honey Locust, Cherry, Plum, Pear, Apple, Ash, Sycamore, Butternut, Black Walnut, Hickory, Oak, Birch, Willow, Poplar, Spruce, Fir and Larch.

When the larvæ have become mature they spin their cocoons in the crevices of the bark, interweaving their long hairs, and within this case they transform to yellowish-white pupæ shaded with dark brown.

The adults which emerge from these pupæ differ a great deal depending on their sex. The male is a moth with large feathery antennæ, tufted legs, and wings marked with several shades of gray and grayish-white. The female is wingless, of a nearly uniform gray and has simple antennæ.

parasitize this species. These insects lay their eggs on the caterpillars, and the young which hatch from these eggs feed on the body tissues of the caterpillar. The caterpillar sometimes dies before it can pupate, but usually pupates, but never emerges as an adult.

The simplest and most effective remedy for this pest is the gathering and destruction of the egg-masses. As the eggs are in a compact mass which is readily torn from the supporting cocoon, either by hand or by some form of a scraper, the task is easily and quickly performed. On account of the female being wingless, a tree once thoroughly cleaned will not become reinfested very soon. It should be kept in mind that only the eggs must be collected and destroyed, on account of the beneficial parasites which may occur in cocoons not bearing egg-masses. This is specially true in autumn and applies to a certain extent to spring, since it has been shown that parasites hibernate as larvæ within the cocoons of the host, and if these are collected and destroyed, it means the death of many beneficial forms.

A striking plant which is very common, especially on land which has been burned over, is the Great Willow-herb or Purple Fire-weed. This species is from three to eight feet in height, has narrow, tapering willow-like leaves and a long spike of magenta flowers, each flower being nearly an inch across.

Beginning at the bottom of the spike, the flowers open in slow succession upwards through the summer, leaving behind the seed-pods which, splitting lengthwise, send adrift the white, silky tufts each with a seed attached.

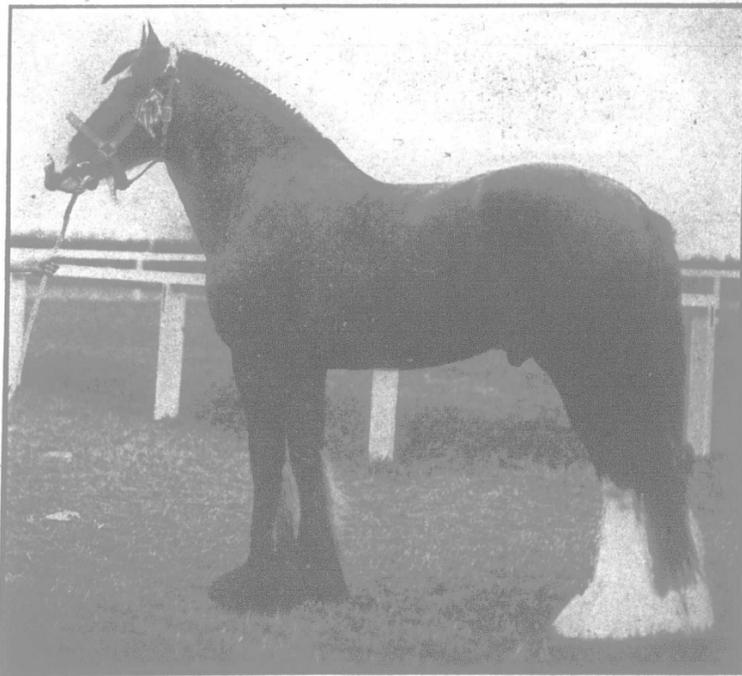
Bees are the insects which transport the pollen of this species from one flower to another. In a recently opened flower the bee comes in contact only with the stamens as the style is curved downward and backward, and in older flowers she leaves the pollen previously acquired on the stigma as the style has stretched upwards.

## THE HORSE.

### Size in the Sire.

The most successful and valuable sires are not, as a general thing, the largest horses of their respective breeds, and yet the breeder, especially of draft animals, must of necessity consider size an important factor in his breeding operations. A short time ago we noticed two fillies, from the same dam but by different sires. One of these fillies is a three-year-old, the other a two-year-old, and at the present time the two-year-old is nearly as large as the older filly, although, of course, may not be filled out to the same extent, or weigh as much on the scales. For

height and general growth the two-year-old will be considered a much larger filly for her age than her older sister. The dam of the fillies was a registered Clydesdale mare of good conformation and weight. The sire of the older filly was a blocky, compact horse, short-coupled and thick, showing an unusual degree of high quality bone. We remember very well having seen him show his paces at the Chicago International Show, where at special request he was brought out during the evening performance to give an exhibition, which, in flashiness, would compare favorably with that put on by the best of Hackneys. We doubt whether he ever weighed more than 1,900 lbs., possibly less, when at his best. The sire of the larger filly was a bigger, more upstanding horse, weighing 2,100 lbs., with not the same weight of body or depth of middle, but a horse which showed high quality and a fair development of bone and muscling for a horse of his scale. In the showing before a good judge



Dunure Independence.

Clydesdale stallion, champion at the Royal.

When the female emerges from her cocoon she crawls out upon it and deposits her eggs on the outside of the case. The eggs laid by a single female average about three hundred and fifty, and are deposited under a white mass of frothy matter which soon hardens and forms a very efficient protection for the eggs against the elements. The eggs hatch in late May and June, and the young larvæ begin to feed on the leaves and soon devour all but the principal veins. When these caterpillars are abundant the trees are often skeletonized, and practically defoliated. The main check on the undue increase of this species is the work of the parasitic insects—the Ichneumon Flies, Chalcis Flies and Tachina Flies. Dr. L. O. Howard, chief of the U. S. Bureau of Entomology, has found twenty-one insects which

of draft horses the heavier animal would, in most cases, win. As a sire both horses were considered successful, and left a number of valuable colts in the neighborhood where they were used. The two colts mentioned are both considered very good specimens of their breed. The larger colt will undoubtedly make the biggest draft mare, but at the present time, notwithstanding the fact that the older filly has not made such rapid growth, she would be considered the better individual. We draw attention to these two colts simply to cite an instance of what may happen in using sires of different weight in breeding work. It may be that the smaller sire was a little more prepotent than the heavier animal, because the older filly resembles her sire slightly more than does the

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