The return for the extra expense is easily seen, but is even more than is apparent on the surface, for a larger number of pupils attend regularly and the school terms are longer. Further, higher grades are taught which formerly were impossible and a larger number of pupils are enrolled. Pupils have a far superior education, in more comfort and better conditions and return home every night. The true cost, however, is not seen in the aggregate. A much fairer basis of estimation is the cost per pupil per day or per month or per annum. In North Dakota in 1912 this worked out as follows:

Cost per pupil per day, city schools..... 24 cents

Cost per pupil per day, rural consolidated schools..... 28 "

Cost per pupil per day, non-consolidated rural schools..... 35 "

In Iowa for 1912 the average cost of tuition per pupil per month is as follows:

County	Consolidated Schools	Non-consolidated Schools
Washington	$1.77	$2.99
Mitchell	2.04	3.37
Marshall	2.53	3.88
Dickinson	1 80	3.59
Emmet —(1) Armstrong.	2.82	
(2) Dolliver...	3.65	3.13
Clay —(1) Lake.....	1.93	3.66
(2) Webb	2.73	3.66
Story	2.73	3.23
Winnebago	1.94	3.48
Buena Vista–(1)-Marathon.	1.88	
(2) Newell....	2.34	3.73
(3) Truesdale	3.29	

The attendance is higher and the average cost of tuiton lower because of better attendance; any plant that runs to capacity is more economical.

In Illinois the same story is told of 1912. Twenty-three districts were condensed into eight. Formerly 653 children were enrolled, under consolidation 940 were enrolled. The eight consolidated schools gave high school courses, lasting in half the cases the full four years of high school work.

In Indiana in 1912 the following table shows the comparative cost per annum:

Cost per pupil, based on average daily attendance	Consolidated (High School Dept. included).	Non-consolidated. (No High School Departments).
Fuel	$ 2.21	$ 2.85
Repairs	1.37	1.82
Janitors	2.15	.97
Teachers	28.16	30.67
	$33.89	$36.31
Transportation	15.23	0.00
Total	$49.12	$36.31

It is seen that the cost of a pupil in a consolidated school is $2.42 a year cheaper, but with transportation included is $12.81 dearer than in the district schools. But the consolidated schools were open a month longer, employed better teachers at higher salaries, employed a male principal and maintained high school departments. The return for the money invested in a consolidated school and for the money spent in operating it, is very much greater than the return on money spent in the old fashioned red school house which it supplanted. The self binder costs more money than a scythe and the steam thresher costs more than the flail, but no farmer would go back to either of these obsolete instruments.

The facts and figures in this article have all been extracted from official reports of Departments of Education, State Superintendents and special bulletins and reports. They may therefore be accepted as accurate.

SINCLAIR LAIRD,
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Nature's Diary.

A. B. KLUGH, M. A.

We have, in Canada, a great many different kinds of spiders—jumping spiders, running spiders and ambush spiders, which build no webs but which either seek their prey or lie in wait for it, and also a large number of species which construct webs. These webs of many different types, irregular nets, sheet-webs, funnel-webs, and most perfect of all the orb-webs.

All the orb-weaving spiders use two kinds of silk in making their webs, a tough, inelastic non-viscid silk, and an elastic, sticky silk, these being produced by separate silk-glands.

In beginning the construction of an orb-web the spider selects some outstanding point, elevates its abdomen and spins out a thread, which is carried off by the current of air. After a while this thread comes in contact with some object and adheres to it, when the spider pulls it taut and fastens it to the object on which it is standing. It now passes over this bridge and strengthens it by adding more lines of silk as it goes back and forth over it. It next proceeds to lay the foundation lines of the web and this it does by fastening a thread to some point, passing over the bridge, spinning a line as it goes and holding this line clear of the bridge with one of its hind legs, and attaching the second line to some other point. In this way several foundation lines are laid connecting with one another and with surrounding objects, and leaving an open space in the middle in which the orb is to be built. The first part of the orb to be laid is a line stretching across the open space and passing through the point which is to be the centre of the orb. In laying this line the spider walks on the foundation lines, spinning out the new line and carefully holding it up so that it does not become entangled with the lines on which it walks. It then walks to the point which is to be the centre of the orb, fastens a line there, carries it to one of the foundation lines and attaches it. In this manner all the radii of the web are laid down. The centre of the web is then strengthened by a network of threads. The next operation is the spinning of a spiral line on the radii, the turns of this spiral being fairly wide apart. All the silk, except that used for the attachment of lines, used up to this time is dry and inelastic, and the spider now proceeds to spin the sticky spiral. In making this spiral the spider begins at the outer margin of the web, and lays down the turns of the new spiral between those of the old, cutting away the old spiral as the new one is laid. Thus the old spiral is used only to hold the radii in place while the viscid spiral is being spun, and to walk on while laying the sticky spiral. In spinning this sticky line the spider fastens it to a radius and then moves on spinning out the thread as it goes to the next radius, but before attaching it here it draws out more silk from the spinnerets than is required to reach from one radius to the other, so that the viscid line is somewhat slack. This slackness allows this thread to be easily stretched by an insect which strikes it and thus the insect becomes more surely entangled by coming in contact with other turns of the spiral.

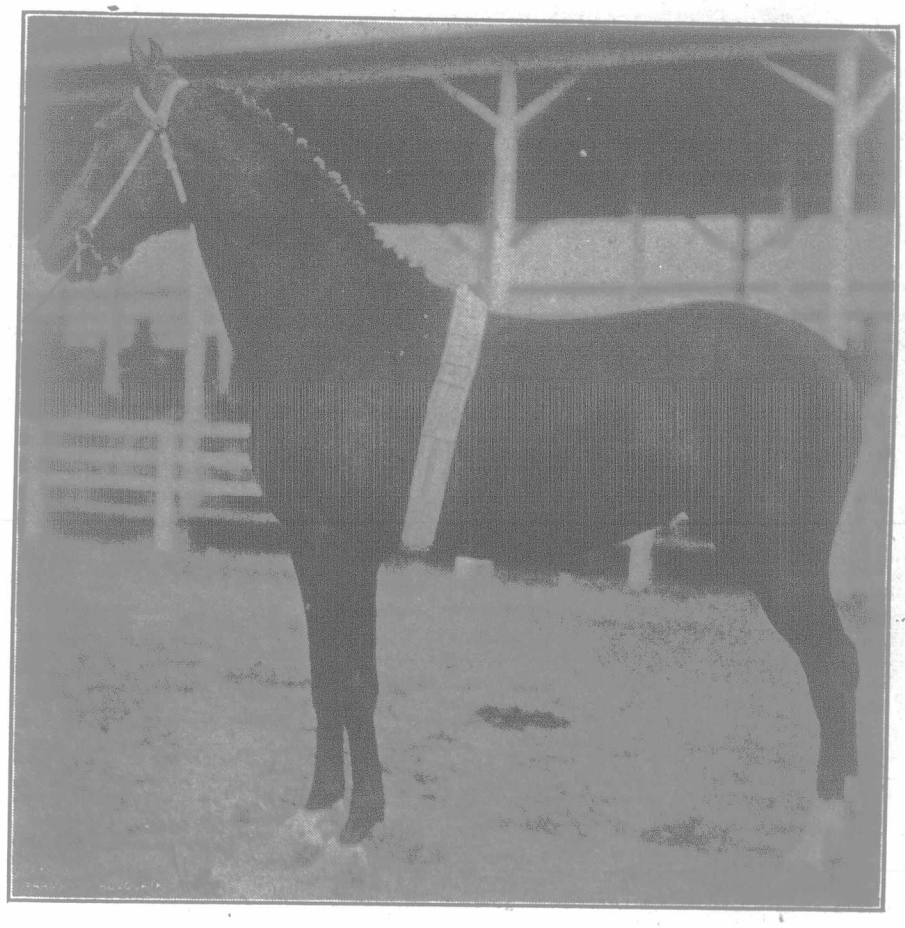
When the web is completed many species of spiders remain at the hub of the web and wait for prey to strike the web, while others build a tent above or at one side of the web, and remain in this retreat. In the case of the latter they make a "trap-line" connecting the hub of the web with their tent, and rest with one or more of their feet on this line so that its vibration will tell them when prey has struck the web, when they rush out along this line and seize the prey.

Spiders kill their prey by piercing it with the chelicerae, a pair of organs at the front of the head, each of which ends in a long sharp claw. Near the tip of this claw is an opening, connected by a duct with the poison glands, which are situated in the anterior part of the body. Thus, when a spider pierces its prey, it injects into it some venom from these glands.

Most of the web-building spiders stab their victims, then dart back to a safe distance. If, after a few moments, the prey is still struggling violently, the spider may stab it several times. It then approaches the prey and, pulling out a sheet of silk from its spinnerets with one hind leg, thrusts the sheet against the insect, and rolls it over and over so as to swathe it in the sheet of silk.

Spiders take only the fluids from the bodies of their victims, pressing it out with the chelicerae and the pedipalps, which are the second pair of appendages on the head, and sucking it up by the action of the sucking-stomach, which is supplied with powerful muscles by which suction may be exerted.

While spiders kill their victims with the venom that they inject into them, the "bite" of none of our spiders, or of any spiders in the northern States, need be feared by man. It is in fact extremely hard to induce a spider to "bite," and in the cases where experimenters have succeeded in making spiders pierce their fingers, the only effect has been a prick like that of a needle and quite as harmless. All the reports which we see of the dire results of "spider bites" are really cases of blood-poisoning, which have been surmised to be due to the "bite" of a spider, and have as such been worked up into a good "story" by some newspaper reporter.



Model's Queen.

Champion Hackney mare at Toronto, owned by Jos. Telfer, Milton West.

THE HORSE.

Joint-Ill and Heredity.

Professor G. H. Wooldridge, Royal Veterinary College, London, Eng., in the course of a paper read before the members of the Royal Counties Veterinary Medical Association, made some remarks on the vexed question of joint-ill. One aspect of the subject which has given rise to a good deal of discussion is that of heredity. Here is what the Professor says: It has been suggested that infection may be hereditary in that the succeeding progeny of some mares become affected, and this view is somewhat supported by those few reported cases in which the joints of foals are enlarged at birth, the result of intra-uterine infection. In my view, however, although that may occur, a more common hereditary feature is that all the progeny of certain dams have a very slowly cicatrising umbilicus due to a rather large umbilical ring, and obviously such an hereditary condition must be regarded as a predisposition. Another reason for progeny developing the condition year after year is frequently that they are born in the same old places without proper care having been taken to disinfect them. In fact that is the case to such an extent that one might almost regard the disease as one of old foaling and calving boxes and of old lambing folds. I have known a farm where year after year most of the foals developed joint-ill. They were all born in the same big, roomy loose box, the only attempt at disinfection being occasional white-washing of the walls. Good results were only obtained when the farmer, who would not pay attention to detail, was persuaded to allow his mares to foal out at grass as the lesser of two evils. This was immediately successful, and the mares which were thought to be transmitting it were proved "not guilty."

The Professor had also some remarks on the use of vaccines and sera. "I think," he said, "I ought to sound a note of warning against a line of treatment that is likely to be very disappointing, as it appears to be based on no reasonable foundation. I refer to the indiscriminate use of vaccines and sera. I can, perhaps, understand a practitioner trying almost anything suggested by a well-worded advertisement and accompanied by a plausible leaflet, for a condition of which the treatment is already very unsatisfactory and disappointing. But why add to the disappointments? Vaccines and sera in certain definite and specific affections have undoubtedly proved of the greatest possible value, but I am afraid that their reputation will be endangered by the indiscriminate use of alleged specific vaccines and sera. The affection we are now considering may be brought about by any of a large variety of organisms apparently either singly or in combination, and though I do know of disappointments following the use of so-called vaccines for joint-ill I know of no satisfactory proof of their usefulness. And I may say the same of a considerable number of other cases of the unjustifiable use of alleged curative and preventive vaccines and sera."—The Scottish Farmer.

A more thorough understanding of the problems connected with farm management might help some agriculturists in their work. Our agricultural colleges have not in the past paid sufficient attention to this department of farm work as a special subject. District Representatives should be well equipped by a thorough training in this necessary phase of farming. Keep in touch with the farm and farmers.