

The Farmer's Advocate AND HOME MAGAZINE.

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DOMINION.

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Nature. Nature study should be emphasized in the rural school, and when it is related to agriculture in an intelligent manner the subject of agriculture in the rural school has been carried far enough. Greater production, the care and handling of live stock, and purely farm topics such as these, are vocational in the extreme; they have no place in the public school curriculum, and teachers, as a rule, are not qualified to handle them.

It is unfortunate that the term "Elementary Agriculture" was ever chosen as a subject for the school curriculum. It would have been better to use the term "Rural Science," as adopted in other countries, and direct the study along nature study lines. The time is drawing near when the nature of the course should be definitely decided on in Ontario, so the ordinary training of teachers will equip them to handle the subject. Then it can be made compulsory, bonuses to teachers and inspectors can be done away with, or included in their salaries, and this teaching of agriculture, so-called will not be such a hit-and-miss affair.

Co-Operations and Progress.

BY ALLAN MCDIARMID.

Is the civilized human being in any respect better off than the savage? Would we rather live and work and get paid for that work in Canada than in one of the South Sea Islands, where men are only a short step removed from the beasts in their forests? It wouldn't take us long to get back to such a state of existence, from which we have risen with so much pain and effort. All we would have to do would be to give up trying. Throw up our hands and let ourselves slide. Hundreds of thousands of years it has taken us to reach our present height, such as it is. It might not take more than a century or two to hit the bottom again.

Taking it for granted that we still have the instinct within us that has made us the struggling, progressive creatures that we are, it isn't likely that there is anyone living in this country that would be ready to trade home, job and prospects with the African savage, or any of his kind, wherever they might have their habitation.

This being the case it might be worth while finding out just what agency was at work, in the ages of the past, to cause us to get on to the track that has led us up to civilization and comparative happiness. (For, say what

you like, the more knowledge man has acquired the more pain and misery he has been able to overcome.) Also it is pretty certain that whatever it was that raised us from a lower existence to a higher will continue the good work, or at least hold us at our present level, if we make use of it.

However, the conclusion I have been forced to come to in this matter of what it is that has put us where we are and, at the same time is helping us to stay there, is co-operation—nothing more—and nothing less.

We have reason to believe that, long before history was written in any way but on the walls of a cave, perhaps, mankind had found out the value of co-operation. For purposes of hunting, raiding his enemies and self-defence, the principle of working together was found to be useful and even necessary. The steps by which this primitive idea worked itself out we haven't the time for, or the means of, following up. It was a gradual growth and development, like everything else in ocean, earth or sky.

But coming down to a time that is of more interest to us, because it is more recent, we are able to deal with facts that have been put on record by men who wrote of the times in which they lived.

It was about the beginning of the last century that co-operation began to be a thing talked about in Great Britain. As in all new movements some one man was responsible. Robert Owen was this man's name. The British co-operative movement acknowledges him as its leader. He was an employer of labor and he saw that the conditions under which the laboring-man was compelled to exist were far from what might have been expected in a civilized country. Extreme competition brought with it long hours, women and children's labor, high-priced and adulterated food and dirty, badly-kept homes.

Owen saw the waste of effort and human life in all this and he reasoned that since it paid the manufacturer to have the best machinery, not to overdrive it, to look after it well and keep it in repair, so it would pay to look after the human machines that worked for him and see that they were kept at the highest point of efficiency by proper housing, food and rest. And it would pay the nation even better than it could pay any individual. The idea of that time was that the country would be best served by each man looking out for the interests of himself and his own family. But Robert Owen maintained that the highest welfare of society could only be brought about through the combined effort of all men, with that object in view. A co-operative effort for the benefit of the people as a whole.

Owen's idea seemed to be that a man's surroundings had more influence in developing his character than anything else. He believed in the effect of environment on humanity rather than in that of heredity. Consequently he did all he could to bring about an improvement in the surroundings of those in this employ and to accomplish this partly through their own efforts. It was a case of "each for all and all for each." The essence of co-operation.

Owen was managing-partner in the cotton-mills at New Lanark and the results of the carrying out of his ideals in that place can best be given in his own words. "For twenty-nine years," he wrote, "we did without magistrates or lawyers; without a single legal punishment; without any money having to be raised for the support of the poor, and without any intemperance or religious animosities. We reduced the hours of labor, educated all the children from infancy; improved the condition of the towns-people, cut down their daily labor, paid interest on capital and cleared over three hundred thousand pounds in the way of profit.

So well did the co-operative plan work out that New Lanark became known all over England and it was visited by thousands of tourists and business-men. Other co-operative plans and societies followed in the wake of this first one and at the present time there are about two and a quarter million members of these societies in Great Britain alone. Their stores have a capital of \$150,000,000 and their sales amount to \$300,000,000 every year.

And the best of it is that the co-operative idea has spread to almost every other country in the civilized parts of the earth and it is hoped and expected that it will stop at nothing short of the millennium.

We know something of it in this country and in the Republic to the south of us. Here co-operative societies have had their support from the farmers, principally, and we have known them under such names as the Grange, the Patrons of Industry and the United Farmers. This last organization is apparently exerting more influence in both Canada and the United States, from a political standpoint, than anything of the kind in the past. And the end is not yet.

Co-operation is right in principle and will rule the world some day. In its narrowest sense it may mean only a group of men who economized by buying in common, or who increase their profits by selling in common. But in its widest usage it means the creed that life may best be ordered, not by the competition of individuals, where each seeks the interest of himself and his family, but by mutual help; by each individual working for the good of the social body of which he forms a part, and the social body, in return, caring for each individual. It proposes to replace humanity's desperate struggle for existence by a voluntary combination for life. Life as it was intended we should live it.

Never neglect the young growing stock. The young things now will constitute the herd in two or three years, and the character of the herd to-morrow depends on the treatment it receives to-day.

Nature's Diary.

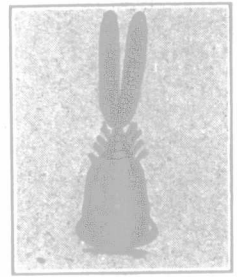
BY A. BROOKER KLUGH, M. A.

"Large fleas have little fleas
Upon their backs to bite 'em,
These fleas have lesser fleas
And so ad infinitum."

We are so used to the idea of mammals, birds and other terrestrial forms of life having external parasites, such as fleas, lice, ticks, etc., on them, that we naturally expect to find every species provided with its own special form of insect inhabitant. But when it comes to fishes, the facts are not so generally known.

The fishes, too, have their external parasites, but they are not insects but crustaceans. That large group of aquatic animals, the Crustacea, to which the crayfishes, lobsters, crabs, shrimps, etc., belong, play much the same role in the waters, both fresh and salt, that insects play on land. There are, of course, a very large number of insects which pass the larval, or the nymph stage of their existence in the water, and some which pass their juvenile stage in the water and their adult stage on the water, but as a group the insects are essentially terrestrial. It is quite otherwise with the crustaceans. There are only a few species, such as the sow-bugs, which are terrestrial, but in the waters they are ubiquitous. There are large species which prey on other aquatic animals, smaller species which prey on still smaller kinds or which feed on vegetation, there are species which are free-swimming, species which are sedentary, species which are so minute that there are hundreds of them in a single drop of water, and there are species which are parasitic on other aquatic animals.

Most of the external parasites of fishes belong to a group known as the Copepods. Many of the Copepods are free-swimming, and these species are very important as the food of small fishes. The parasitic Copepods are more or less degenerate, a fact which is in accordance with the general law that as soon as an organism begins



A Parasitic Copepod (Enlarged).

to rob another, so soon does it begin to lose some of its original powers, while the organs in which these powers were located degenerate and finally disappear. One of the first parts to be affected in parasitic animals are those concerned with locomotion, and we consequently find the majority of these parasitic Copepods incapable of moving about in their adult state. They are firmly fixed in one position upon the fishes body, and there they must remain all their lives. When first hatched they could swim about freely, and during this period they seek out the fish and fasten themselves to it. Then as development proceeds they lose their ability to swim and the swimming organs disappear. Other parasitic Copepods retain their ability to crawl about throughout life and can move over the fishes body.

Naturally enough, all these forms, the fixed as well as the free, seek those places on the fishes body where the blood can be most easily obtained. Such places are the gills, the gill-cavities, the mouth and the fins. The females of these parasitic Copepods have two egg-strings at the posterior end of the body, (see Fig. 1), and the females are much more abundant than the males.

The parasitic Copepods cling with great tenacity to their hosts. This is rendered necessary by the fact that water is a much denser medium than air. In many species some of the mouth-parts are modified into sucking discs, in other species the basal joints of the antennae have sucking discs, while in most of the fixed forms there is one or more pairs of stout claws for burying in the fish's flesh. Of course, the hooks and claws which they bury in the flesh produce considerable irritation, and there is nearly always a swelling where these claws lacerate the fish. But the parasites also have mouth-parts adapted for causing a flow of blood, and their upper and under lips are fused together into the form of a tube through which the blood is drawn up. In fishes whose body is protected by scales the parasites either fasten on the gills, fins, etc., where there are no scales, or burrow under the free edge of the scale until they reach the underlying skin.

The constant withdrawal of blood is certain to weaken the fish's vitality. Usually the parasites are not present in sufficient numbers to threaten the life of the fish, but if a fish becomes weakened or diseased in any way, even a few parasites may prevent it from recuperating, and thus cause its death.

Where many fish are kept in rather confined quarters, as in artificial ponds, the number of parasites often increases to a dangerous extent. In such cases it is necessary to catch and examine carefully all the fish, and to reject those which are heavily parasitized.

The relation between the fish and the parasitic Copepods is not altogether a one-sided one, as most fishes in their young stages, and the smaller fishes throughout their lives, feed very largely on Copepods and the free-swimming young of the parasitic Copepods furnish part of their diet. Minnows, shiners and sticklebacks are particularly fond of Copepods, and hence are useful fish to have in a pond to keep down the numbers of the parasitic species.