

The Farmer's Advocate AND HOME MAGAZINE.

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DOMINION.

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a large amount it is necessary to consider the small things that contribute to the total. There is nothing about a farm so insignificant as to be unworthy of thought and care, for often those things considered of little importance can be developed into an enterprise that will eclipse all others on the same farm with regard to gains.

An investigation into the living expenses of rural families in the United States revealed the fact that the average value of food, fuel, oil and shelter per person for the families visited was \$129.74, of which \$91.37 was furnished directly by the farm, and \$37.77 purchased. The average value per family was \$595.08, of which \$421.17 was furnished by the farm and \$173.91 purchased. These figures tend to prove that a living valued at approximately \$425.00 is first taken from the farm after which we begin to reckon the income. It was also learned that tenants purchased eight dollars worth less per person of necessities than did land owners, or in other words they depended more upon the land for their living to the extent of \$8.00 for each member of the family than did the owners of farms.

This investigation only confirms in our mind the opinion that a good living lies latent in the farm, while over and above that are the opportunities for profits and revenue. This livelihood is seldom considered when the farmer counts up his returns at the end of the season, yet he has been collecting them daily throughout the year in part payment for his toil.

A lesson can also be learned from the difference in the cost of living between the tenant and the land owner. If farmers would devote more attention to the garden, dairy and poultry they could decrease their living expenses considerably, and at the same time not detract from the tastiness of their culinary allowance. What the farmer produces in these lines are considered luxuries, when fresh, by the urbanite. Agriculturists might increase their incomes by decreasing their living expenses without resource to parsimony or undue frugality.

Agricultural Colleges and Experimental Farms are meant to lead not follow. What can our institutions tell us about sweet clover and thick vs. thin planted corn for silage from their own experience? Speak up experimenters!

Nature's Diary.

A. B. Klugh, M.A.

The lover of outdoor life frequently encounters those curious growths on various parts of many plants which are called galls and wonders what produces them and how they are produced. These structures are caused by several insects belonging to widely separated groups and are the result of abnormal growth of plant tissue due to irritation. This irritation is applied in two distinct ways, some galls being produced by a secretion injected by the female insect when the eggs are deposited, others by a secretion from the larva after it hatches from the egg.

Many galls are produced by the Cynipid gall-flies, which are really not true flies, but little, four-winged insects allied to the wasps and bees. These insects are all very small, the largest species being not more than one-third of an inch in length, and have four clear wings with few veins. The females have long, slender, and flexible ovipositors, composed of several awl-like pieces, which are used to pierce the soft tissue of the leaf or young twig so that an egg may be deposited in the succulent growing plant-tissues. Each female thus inserts into the leaf or twig many eggs, perhaps but one or two if the galls are going to be large ones, or perhaps a score or more if the galls are going to be so small as to be capable of crowding. In two or three weeks the egg gives birth to a tiny footless maggot-like white larva, which feeds, undoubtedly largely through the skin, on the sap abundantly flowing to the growing tissue in which it lies. With the birth of the larva begins the development of the gall, which is an abnormal or hypertrophied growth of tissue about the point at which the larva lies. The stimulus for its growth undoubtedly comes from the larva and probably consists of irritating salivary excretions. In some cases the gall grows around and includes but a single larva, in others several to many. The larva reaches its full development about coincidentally with the full growth of the gall, this period varying much with different galls. In the galls on deciduous leaves this period is shortest, ending in the autumn; in twig galls it may not end until winter or sometimes the second winter. When dead the gall hardens and dries, thus forming a protecting chamber in which the larva pupates. The pupa undergoes its quiescent life securely housed within the dry gall, which may fall to the ground or cling to the bare twigs. From the galls the fully developed flies gnaw their way out when new leaves and tender twigs are appearing, ready to prick in new eggs for another generation.

One very interesting fact in the life history of some of these gall-flies is that the new eggs may be deposited on plants of another kind and the larvae from them stimulate the growth of entirely different-shaped galls, and they themselves develop into gall-flies of markedly different appearance from their mothers. These new gall-flies in their turn lay their eggs on the first host-plant, the forming galls are like those of the grandparent generation and the fully developed flies are like their grandparents. Until this "alternation of generations" as it is termed was understood the mother flies and their progeny were classified as belonging to different species.

The oak is a very favorite tree of the gall-insects, and a great number of different galls are found upon it. The commonest and most conspicuous galls of the oak are the Oak Bullet Gall formed by a gall-fly (*Holcuspis globulus*), a cluster of bullet-like galls on the terminal twigs, the galls being yellow or reddish in summer, turning brown in the fall and being corky texture; the Large Oak Apple, the work of *Amphibolips confluentus*, which is nearly globular in shape, green or brownish in color depending upon its age, and has the interior filled with a spongy mass in the centre of which is a single larval cell; and the Larger Empty Oak Apple, which is produced by the gall-fly *Amphibolips inanis*, and which is much like the last-mentioned gall but the interior is nearly empty, the small larval cell being held in position by numerous radiating filaments.

A very conspicuous gall on the willow is the Pine-cone Willow Gall, which is caused by a gall-fly, *Cecidomyia strobiloides*, depositing her eggs on the tip of a bud of the willow. As soon as the larva hatches out and begins to eat the growth of the twig is arrested, the leaves are stunted until they are mere scales and overlap so as to give the gall the appearance of a pine-cone.

There are two very common galls on the Goldenrod, one spherical, the other elliptical; the former is caused by a gall-fly, while the latter is the work of a little brown and gray mottled moth about three-quarters of an inch in length. This moth lays its egg on the stem of the Goldenrod, the larva then bores into the stem which enlarges to form the oblong gall, and feeds on the substance of the enlarged stem. When the larva attains full growth it cuts a little oval door in the upper end of its house, and makes a bevel by widening the opening towards the outside. It then makes a little plug

of debris which completely fills the door, but because of the bevel no intruder can push it in. Thus the larva changes to a pupa and lives in safety and when the pupa becomes a moth all it has to do is to push its head against the door and out it falls, allowing the moth to emerge.

A very attractive gall which occurs on several species of Rose-bushes is the Mossy Rose Gall. It looks like a large tuft of velvet and is bright-green tinged with red.

THE HORSE.

Horse's Teeth and Age.

The man on the farm will never know too much about the methods of telling the age of a horse by its teeth. In fact, most farmers and farmers' sons neglect altogether this important phase of the horse business. The buyer and seller of horses should be able to tell with reasonable certainty the age of any horse which may pass through his hands. A writer signing himself "Vet" in "The Farmer and Stockbreeder" recently described the method of telling a horse's age. This is not new, but we repeat some of it for the benefit of those anxious to learn more about the mouth of the horse. This year, it is particularly important that farmers should know how to tell the age of their animals. The Remount Commission and Army horse buyers require horses of a certain age. There is no use of taking old horses or horses too young, several miles to a buying centre, and some trouble might be saved if all horse owners knew how to tell the age of their horses. "Vet" gives as the chief features a few simple rules to follow.

When the foal is born two front teeth are through or partly through the gum, and one on either side of these may generally be felt or is showing a mark where it will be through in a few days. At two weeks of age the colt has four front teeth showing in the lower jaw, the place to look for age. In six or eight weeks the second pair of teeth known as laterals as well as the temporary molars are well up. A yearling between one and two years old has all his teeth and is sometimes mistaken for a five-year-old animal. The following sentence, while not absolutely accurate is a very convenient one in remembering the age of horses—"2½, 3½, 4½." At about two and a half years of age, or in the autumn for a spring-foaled animal, the first or central pair of teeth are clearly through the gums or about half way up. Such a horse is said to be "rising" three years old. By the following spring, or when the horse is three years old, these teeth are up to the top or meeting those in the upper jaw. These teeth are so much larger than the baby teeth on either side of them that they clearly mark the animal as a three-year-old. In the following autumn, or when the horse is three and a half years old, a tooth is cut on either side of the two permanent teeth already matured, then the horse is said to be "rising" four years old. By the end of the following May, four years old. By the end of the following May, four lower permanent teeth matured and meeting those of the upper jaw, while the temporary milk teeth at either end remain showing much smaller and whiter than the new permanent teeth. The last permanent teeth in an early-dropped foal generally appear in the animal about June of the year it is four years old. Such an animal is correctly described as "four off," until the following fall when he will be "rising" five. A horse is not five years old until the upper and lower corner teeth meet over their whole surface. The front edge has begun to show wear. The four-year-old corner tooth is not level with its fellow in the upper jaw until the horse is about four and a half years old. Then 2½, 3½, 4½, are the ages when the mouth shows the changes indicated and described.

A six-year-old mouth is denoted by wear on the corner teeth. The shelly appearance on the inside has gone and the table or surface of the tooth shows wear on the front and back edges, except for a small point at the side. The wear is greatest on the front edge. The teeth on either side of those next to the corner teeth have the cavity growing out and showing much less of the black mark than the previous year, and the black mark surrounding the black mark has layer of enamel surrounding the black mark begun to assume an oval shape. The cavities of the two central incisors are almost gone but the enamel ring surrounding the original black mark has by this time assumed an elliptical shape, extending along the diameter of the tooth table and is nearer to the back edge than to the front one. The tusk will be fully developed with its groove, and as yet the tooth shows no wear.

At seven years of age the corner nippers show a slight shallow cavity and their tables are complete. The central enamel is well defined, elliptical in form, and is nearer to the back than to the front edge of the tooth. The enamel of the lateral incisors has assumed a shape approaching oval and the shallow mark remaining does not extend so far as at the age of six. The tooth