

Mlle. Zoe's Tigress

By WILL W. WHALEN.

Mlle. Zoe had a new lover, but what of that? Mlle. Zoe had a lover in every town that the circus reached. Other men less susceptible than Ralph Patterson lost their hearts at sight of Mlle. Zoe.

Now the circus was at Montgomery. But Ralph Patterson, being no laggard in love, had followed Mlle. Zoe there. He sat now in her dressing apartment, his eyes on her mobile face.

"You ask me to marry you," she said, sweeping her golden pompadour from her white forehead. "Do you realize what that means? There is little virtue on the stage, there is less in the circus."

"You are young to talk that way," he argued.

"Yes, I am young." There was a touch of bitterness in her rich voice. "But despite my years, a man had as well marry my pet tigress, Lady Belle, as me."

"You can leave the circus." "I had intended to do so before I saw you. This is my last season as lion-tamer. I intend to go on the stage."

"Marry me, and let me prove my love."

"You must wait for your answer." She glanced at her watch and arose as a sign of dismissal. "I must perform."

"Is there in this world today a man whom I could love—a man worthy of a woman's love?"

Mlle. Zoe moaned these words passionately into the ear of her pet tigress. Fierce Lady Belle quailed before the fierce fire in the eyes of her mistress.

The circus had remained three days at Montgomery; now it was to leave. Ralph Patterson was again in Mlle. Zoe's dressing apartment, pleading his love, and devouring her beauty with his liquid blue eyes.

"I must tell you a story, Ralph," she said. "Seven years ago, in a coal mine town, not far from here, there lived a little girl, pretty with a moonbeam prettiness. She trusted every one, because she was good. She trusted one to her sorrow—a man. He wooed her with soft, innocent blue eyes, like yours; he kissed her with frank lips, like yours; he caressed her with strong hands, like yours. That man left the little girl to the mercies of the world, her name gone, her life blasted. The world pointed the finger of scorn at her and shut its doors in her face, while he 'held his head high and cared for no man, he.' By chance, the little girl got some education; it doesn't matter how; she became brilliant and was sought after even by the one who had spoiled her life. The moonbeam turned into a sunbeam."

He attempted to rise, but a hand, as soft and white as a snowflake, touched his wrist, and kept him to his seat. "I was that little girl, Ralph Patterson; you were that man. Take education, bleached hair and seven maturing years from Mlle. Zoe, and you have little Emma Stone, whom you made an outcast."

His face lost its look of innocence; guilt flushed it from brow to chin.

"Your voice was as winning then as now. I should love you, were you past unknown to me. You love me at last, but I do not want such love as yours. There has been an invisible cord binding us together all these years. Even the wounded insect may lame by its sting the one who has hurt it. You took from me all that made life worth the living; and revenge is written on my heart with a pen of iron, with the point of a diamond."

She cast a glance upon him, like the glance of a lioness that sees her prey within reach. He kept his eyes to the ground. He heard a curtain pulled aside, and heard something spring near his feet. One lightning glance showed him an open cage, Mlle. Zoe, whip in hand, and a sleek tigress crouching to spring. He was petrified in his chair. Then the beast's claws had rent his flesh.

Mlle. Zoe had looked forward to her revenge, but now it was turned to ashes on her lips. All the woman in her was aroused to action; the tenderness of long ago came to life in her bosom; her hardness melted. She saw that Lady Belle had inflicted as yet only scratches and a slight wound. She slashed the beast from Patterson's shoulders, screamed to him to fly. He staggered to the opening in the canvas, and out into the air and sunlight, calling for help.

But Lady Belle had tasted blood; no fear could hold her in check now. Her fangs met in Mlle. Zoe's slender throat, her sharp cruel claws rent the beautiful shoulders.

Mlle. Zoe's circus tour was ended. (Copyright, by Dally Story Pub. Co.)

Method in His Madness.

"Do you know that you paid that woman five cents to ride on this car?" asked the friendly man on the back platform, after a woman had been let off at the corner.

"How do you figure that?" asked the conductor.

"Why, she handed you a 50-cent piece, and you gave her three dimes and a quarter in change," returned the friendly man.

"Oh, is that the woman I gave the three dimes and a quarter to?" said the conductor, smiling. "Well, she'll have a hard time passing the quarter. That's the way I get rid of all my bad money. Just so long as you give them a nickel or ten cents too much, they'll never stop to see whether it's good or bad."—New York Evening Post.

HOME COURSE IN SCIENTIFIC AGRICULTURE

THIRTEENTH ARTICLE. SOIL RENOVATION.

By W. J. SPILLMAN, Agriculturist in Charge of Farm Management Investigations, United States Department of Agriculture.

THERE is a vast difference in the natural fertility of soils. Some do not produce well from the start unless special attention is given to making them productive, others produce large crops for a short time and then rapidly diminish in fertility, while others, known as strong soils, remain productive for many years without attention to their fertility. But even the strongest soils will wear out in time unless they are intelligently managed.

Plants in their growth make use of thirteen chemical elements, nine of which they secure directly from the soil. These are called the mineral plant foods. They are phosphorus, potassium, calcium, magnesium, sodium, iron, silicon, chlorine and sulphur.

The growing plant requires four other elements, as follows: Hydrogen, which it secures from water; oxygen, which it secures partly from water and partly from the air; carbon, which is secured from carbonic acid gas in the air, and nitrogen.

Nitrogen is in many respects the most important of all the plant food elements. It is not found in appreciable quantities in the rock particles of the soil. Ordinary plants depend for their nitrogen entirely on decaying organic matter. As decay proceeds ni-



Photo by Delaware agricultural experiment station.

THE SOY BEAN, A GOOD SOIL BUILDER.

trates are formed from the nitrogen contained in organic matter. The nitrates are exceedingly soluble, and unless soon made use of by growing crops they are washed out of the soil. Nitrogen is therefore usually the first element to become exhausted.

Fortunately there are certain species of bacteria that can use atmospheric nitrogen, of which there is an inexhaustible supply. One family of plants, the legumes, has learned to exchange work with these bacteria, and these plants are thus easily supplied with an abundance of nitrogen in a form they can use. When these nitrogen fixing bacteria are present in a soil on which a leguminous crop is growing the bacteria invade the roots of the legume and live there. Their presence is usually made manifest by swellings—the so-called tubercles—on the roots of thrifty plants of clover, alfalfa, beans, peas and other legumes. The tissues of leguminous plants become very rich in nitrogenous compounds, and when they decay in the soil they set free large amounts of nitrates for the use of crops.

The cultivation of leguminous crops is one of the most important and economical means of maintaining a supply of nitrogenous plant food in the soil. Nitrates may of course be supplied in commercial fertilizers, but fertilizers containing nitrogen are very expensive, and it usually pays better to supply nitrogen by growing legumes or by the application of stable manure, which is rich in nitrogen when properly handled. In good farm practice both stable manure and leguminous crops are used as sources of nitrogen.

In order to produce a ton of dry hay on an acre of land it is necessary that the growing grass pump up from that acre approximately 500 tons of water. The soil must not only be in condition to absorb and hold water well, but it must be porous enough to permit water to flow freely from soil grain to soil grain. The presence of large quantities of decaying organic matter (humus) adds enormously to the water holding capacity of the soil. Not only that, but the shrinkage of the particles of decaying organic matter and the consequent loosening of soil grains keep the soil open and porous.

Furthermore, humus of good quality is exceedingly rich in both nitrogen and mineral plant food. The maintenance of fertility may almost be said to consist in keeping the soil well supplied with humus. The first step in renovating wornout soils is to give them an abundant supply of humus of good quality. Perhaps the best source

of humus is stable manure containing both the liquid and the solid excrement, especially when the stock is fed on rich nitrogenous foods. Even a poor quality of barnyard manure which has had much of the plant food leached out of it has a considerable value because of the humus it makes.

Another cheap and valuable source of humus, but one which must be used understandingly, is crops grown to turn under as manure. The legumes are especially valuable for this purpose because of the nitrogen they contain, but other crops, such as rye and even corn sown thick, may sometimes be made to supply large quantities of humus of fair quality. Crops thus used are called green manures.

A proper circulation of air in the soil is just as important as any other factor of plant growth. Nearly half of the volume of ordinary soils is occupied by air spaces. Plant roots must be supplied with air, and the soil must be porous enough to permit of free circulation. A good supply of humus and proper tillage will accomplish this result in clay soils. Sandy soils are usually too porous, needing humus to help them retain water.

Another reason why air must circulate freely in the soil is that large quantities of oxygen are required to insure proper decay of organic matter to supply plant food. Also carbonic acid gas is produced by the decay of organic matter, and this must escape easily to make room for the atmospheric oxygen needed in the soil. One of the most important objects of plowing is to loosen up the soil for aeration.

Considerable evidence has been accumulated during recent years to show that during the growth of the plant certain unknown organic substances are given off which, when they accumulate in the soil to any extent, are harmful to the further growth of plants of the kind that produced them. It is possible that some of the benefits known to arise from systematic crop rotation may be explained on this basis. These harmful substances seem to be disposed of rapidly by certain soils, usually those in which organic matter is readily converted into humus.

In connection with the study of these poisonous organic products it has been found that they may be destroyed or at least rendered harmless in a variety of ways. Barnyard manure or decaying organic matter, such as a green crop of rye or cowpeas, turned under has a very marked effect in freeing the soil from them. Almost all of the common commercial fertilizing materials act more or less in the same way. Thorough and complete ailing of the soil by plowing and thorough surface tillage will often destroy or overcome these poisonous substances. When the same crop is not grown oftener than every three or four years on the same land the injurious substances a crop throws off seem to have time to disappear before the same crop is grown again; hence the benefit from crop rotation. When the soil is well supplied with humus there is seldom any trouble from this source, and the same crop may be grown year after year with good yields, though continuous cultivation of the same crop may invite injury from certain insects and fungous diseases which live over in the soil or in the remains of the crop.

Improper methods of tillage add very greatly to the evil effects that result from lack of humus. In many parts of the country the land is plowed only three or four inches deep. In most cases work done in subsiding is practically wasted, and it is doubtful if it ever pays. A much better method is to plow a little deeper each year until a depth of eight or ten inches is reached. This gives a deep layer of good soil, particularly if the supply of humus is kept up.

When new soil or that which has lain undisturbed for several years is broken up it is always best to plow deep from the beginning, for the deeper layers will be about as fertile as any, except the top inch or two. It is wise, too, never to plow the same depth twice in succession. In general, fall plowing should be from seven to nine or ten inches and spring plowing from five to seven inches deep. There are special cases in which these rules do not apply.

We plow the soil in order to loosen up its texture and get air into it; also to turn under stubble, manure, etc., to make humus. Killing weeds is another object accomplished by plowing. After a soil has been thoroughly pulverized to great depths, so that there is no danger of turning up packed clay, the deeper the plowing the better the crops. But the cost also increases with depth, so that ordinarily it does not pay to plow more than about ten inches deep.

Some crops prefer rather a loose seed bed. Other crops, such as wheat and alfalfa, prefer a fairly compact seed bed; hence frequent harrowing and rolling after plowing is good practice before seeding to these crops. Nevertheless it pays to plow the land for them, even if we have to compact it again before seeding.

Sandy soils are usually not injured by handling when wet, but the case is different with clay soils. The effect produced by working clay soils wet is known as puddling. The proper time to plow land is when it is just moist enough to break up mellow, neither wet enough to leave a slick surface where rubbed by the moldboard nor dry enough to break up in large clods. If continued rain follows wet plowing little harm follows, but hot, dry winds would soon leave only a mass of unmanageable clods. In spring and mid-summer plowing particularly it is of the utmost importance to run the harrow immediately after the plow. This prevents the formation of clods. In late fall plowing the clods are no disadvantage, for they will be broken up by freezing and thawing.

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