

THAT ROAD WITHOUT A TURN.

Far beyond the Fairy Highway. Where truth and justice will not burn, We once more look with pleasure To that road without a turn.

THE CASE AGAINST THE DEAN SMELTER.

"This is very good, John," Professor Hammond said, looking up from the carefully written-out record of the experiment his young assistant had been making. "By the way, what did you mean when you told Tompkins that you were not going on with your class next year?"

The old professor's kindly face grew grave. "I see, John can do this just as well as any man here. If it proves too much for him, I'll go down and take a look at the trees."

The three men talked for an hour. Then John Darrow bade the others good-by and went hurrying across the campus. He was obliged to make a hurried trip to San Francisco to prepare himself for his work.

When Dean reached the office of his reducer works the next morning, he found John waiting for him. The young man was arrayed in a khaki suit and stout shoes. Over one shoulder was slung a knapsack containing a magnifying glass, a few simple chemicals, a lunch, and a flask of water.

"Now what do you want me to do to get you started?" Dean asked. "O, I am started already and came to report that I was at work. Mr. Brunney has given me permission to visit his grove and gather all the leaves I need. He was polite, but positive that there was no reason for the blight save the gases from the Dean smelter."

Ned Dean frowned. "Well, I must leave it all to you. If I can do anything to help, let me know. It will not be very pleasant tramping round here, because it is so dusty. I'd be mighty glad to see rain."

"Rains rarely come before November. It is unusually dry this summer, for last winter's rainfall was less than half the usual amount, and the year before was a dry one. Good-by, Mr. Dean. As soon as I have anything to report, you shall hear from me."

Health and Happiness "Mens sana in corpore sano" Number 26. THE EFFECT OF BACTERIA UPON MILK.

To avoid the evil influence of bacteria have been designed all the methods of caring for the dairy and barn, all the methods of distributing milk in ice cars. Moreover, all the special devices connected with the great industry of milk supply have for their foundation the attempt to avoid, in the first place, the presence of too great a number of bacteria, and, in the second place, the growth of these bacteria.

It has been shown how bacteria get into milk and that the more carelessly it is handled, the greater the number present. As milk is an ideal food they begin at once to grow and multiply with great rapidity producing changes in the milk commonly called fermentations.

THE SOURING OF MILK. The most universal and familiar change effected in milk is its souring due to the action of certain of the milk bacteria upon the milk sugar (lactose) converting it into lactic acid. The acidity begins to be evident to the taste when it reaches about 0.3 per cent, calculated as lactic acid. As the formation of acid goes on, the casein is precipitated and curdling of the milk occurs.

The formation of lactic acid is a characteristic possessed by a large number of species. Although many different species are known to have the power of souring milk, they do not affect the milk in the same way as they differ in the kind and amount of acid produced and in other changes, so that the resultant soured milk is quite variable. In spite of this variety, however, bacteriologists are now agreed that a few species—perhaps one or two—are commonly responsible for the natural souring of milk.

Some authorities describe the common lactic bacteria as a single species, a small rod, to which the name Bacillus acidilactici is given. Others divide them into two groups. One of these comprises gas-forming bacilli of the Bacillus lactis aerogenes type and closely related to the colon bacillus commonly found in the intestinal tract. Wherever carelessness prevails in the matter of cleanliness, these gas-producing forms are apt to be abundant.

Another group is a streptococcus to which the name Streptococcus lacticus has been given. It is very abundant in naturally soured milk and has been found on the skin of the cow, in cow-dung and in milk at all stages of handling. There is no scientific foundation for the belief that thunder storms cause milk to sour prematurely. It is explained by the fact that atmospheric conditions usually incident to a thunder storm are such as permit of a rapid growth of bacteria. Sterile milks are never affected by the action of electric storms.

Occasionally milk becomes so slimy that it can be drawn into long threads. This often proves a costly and troublesome infection to the dairyman for it sometimes persists in spite of all attempts made to remedy it. Failure to properly sterilize cans, and particularly strainer cloths, is frequently responsible for continuance of the trouble.

Bitter milk may be ascribed to a variety of causes. A number of plants, when consumed by animals, possess the property of affecting milk. At certain stages in lactation, a little salty taste is occasionally noted that is peculiar to individual animals. There are a number of species of bacteria capable of imparting a bitter taste to milk and its products, although little is known of the chemical nature of the substances concerned.

Milk that has been cooked is likely to develop a bitter taste. This is explained by the presence of spore-bearing bacteria which are not destroyed by the heat. Bacteriologists have been able to trace the connection of all these infections with the growth of unusual bacteria in the milk and thorough disinfection of the utensils and premises is usually sufficient to stamp them out.

Hogs Solve the Garbage Problem.

The prevailing system of garbage disposal in American cities is that of incineration. This puts a burden upon the taxpayer or home owner according to the system of cost distribution, and at the same time results in an economic waste. The reports of health departments in a majority of American cities prove that garbage disposal is regarded as an unsolved problem.

The city of Denver, with its 250,000 inhabitants has paid nothing for the collection and disposal of its garbage for ten years, neither as a municipality, nor as individual citizens. The garbage question there is the least troublesome of all the health-department problems.

The contract between the city and the hog-ranch corporation runs in four-year periods. For a consideration, \$1, the Denver hog ranch is given the privilege of hauling away the city's garbage. The company's equipment for this work consists of 35 steel tank wagons, each of 600-gal. capacity.

City ordinances require every home owner to provide a covered, galvanized iron garbage can; to keep this can clean; to throw into it only edible garbage. A garbage collector who finds paper, glass, or other foreign substances in the cans reports the matter to city authorities and the resident is compelled to dispose of this garbage himself.

In addition to regular government inspection at the packing houses, the state veterinarian inspects the ranch and its stock about once a week. The hog-ranch corporation is a highly specialized organization. The average number of hogs maintained is 5,000.

As soon as they will eat, the young pigs have garbage fed them, and this continues to be the basis of their diet until they reach the market size. When introduced in the weaning yards, where they remain until eight or ten weeks old, the young pigs have alfalfa added to their diet, for a straight garbage diet does not produce as valuable pork as does a balanced ration.

The ranch has 1,300 acres of alfalfa field under lease, from which an ample supply is derived. When weaned the young pigs are immunized for life from hog cholera. A veterinarian injects cholera virus and cholera serum at the same time. Following this treatment the pigs go into the fattening pens, being graded and regraded once or twice a month, and promoted according to weight.

Shoats, upon reaching a weight of 150 pounds, are sent to the finishing pens, where corn is added to their diet. Attendants select brood stock at this time, and these animals never receive corn, as they must be kept thin.

FARM NOTES.

Where trees are planted in the fall, the roots should be exposed as little as possible to sun and air; the soil should be packed very firmly about the roots and the trees should be set slightly deeper than they stood in the nursery, with the largest roots and also the largest limbs, if possible, directed toward the prevailing winds. The trees should also be leant somewhat toward the southwest to reduce the danger of sun scald.

Numerous examples might be cited to show the influence of a purebred sire in grading a herd. At the Pennsylvania State College a herd composed largely of grade cows originally, just such as the average dairy farmer possesses, contained a few purebred animals. All the heifer calves, good, bad and indifferent, were raised and added to the herd. The object of the experiment was to determine the value of the purebred bull in increasing the average production of the herd when culling was not practiced.

The results are as follows: The average yearly yield of butter-fat per cow for the first five years was 225.7 pounds; for the second five years, 245.4 pounds; and for the third five years, 266.9 pounds. These figures show an average yearly increase of 41.2 pounds for every cow in the herd during the third period as compared with the first. This increase was evidently due largely to the influence of the purebred sires, since no culling or selection was practiced.

In investigations in Illinois, Howard's Dairyman found that dairymen who were grading up their herds with purebred sires were receiving over \$20 higher returns per cow annually than those practicing no grading. Surveys in Tompkins county, N. Y., developed the fact that dairymen with purebred sires were clearing on the average \$1,012 annually, after paying all expenses and deducting five per cent. interest on capital invested, as against \$395 per year cleared by dairymen with great sires.

Root crops such as beets, carrots and turnips, can be very successfully and economically stored for the winter in outdoor pits. They will endure frost but should be harvested before freezing weather occurs, which in many parts of Pennsylvania is usually the early part of November. Parsnips and salsify are quite hardy and may be left in the row in the garden and dug the following spring, or stored like other roots.

The tops of beets should be cut to within an inch of the root. Close cutting causes bleeding and a loss of color. Other tops should be topped close to the crown. The pit must be located in a well drained part of the garden. A shallow excavation, five or six inches deep, two or three feet wide and as long as may be necessary, provides a good pit, according to J. R. Bechtel, of the Pennsylvania State School of Agriculture.

Sometimes the pit is lined with straw or leaves. As soon as roots are dug they should be topped immediately, placed in the pit in a conical or inverted V-shaped pile and covered with heavy paper, leaves, or better, with straw. Roots go through a sweating or heating process when first placed in storage, during which time ventilation is absolutely necessary. For this reason the top or apex of the pile should have only a light covering of straw until late in the fall. During cold, frosty nights old carpet, bags, or similar material may be spread over the top for protection.

After sufficient time has been allowed for the escape of heat and when severe freezing weather arrives, successive layers of soil each several inches deep should be added to the pile until it is covered to the depth of a foot. The average yield per acre, of potatoes for the past ten years, in Pennsylvania is only about 85 bushels. This is due to several factors, according to authorities of The Pennsylvania State College, one of which is the common practice of planting tubers from unselected stock.

If the farmer at digging time will select his seed for next year's planting from the healthy and most prolific hills and store the seed in a cool, dry place, preferably apart from the common stock, he will find that such selected seed will often double his yield. Do not fail to select tubers from hills which are free of scab or any form of rot. By this precaution much disease will be eliminated from the next season's crop. Potatoes keep best if stored at a temperature of 33-36 F., but very well also at a temperature of 40 degrees or even a little higher, according to the authorities of The Pennsylvania State College.

Ideal conditions for potatoes are attained where cellars of dwelling houses are used for storage places, but such cellars may often be made satisfactory. A cellar room in which there is a furnace is too warm for potatoes. When there is heat in any part of the cellar, the storage room should be separated from the rest of the house by brick, concrete or double wall of tongued and grooved boards having a dead air space. Such storage room should have at least one window by which ventilation can be arranged. The floor should be of earth rather than concrete or wood. It is important that light be excluded from stored potatoes, for even diffused light tends to turn the tubers green and to injure them from table use. When conditions are not suitable for cellar storage, it is often advisable to store in pits those intended for late winter and spring use. Only a well-drained site should be chosen for a pit. An excavation five or six inches deep should be made and this cavity lined with straw, hay or leaves. The potatoes should be piled on this material in a compact heap, then covered with four to six inches of straw and followed by a six inch layer of earth. After the earth has frozen somewhat another layer of straw and a second layer of earth should be added. The layer of earth should be eight or ten inches deep. Water should be drained away from the pit by means of shallow ditches.

Men from 18 to 40 Proposed for Draft.

Washington, Oct. 25.—Congress will be asked immediately on reconvening to include men from 18 to 40 in the draft. Amendments to the present law are already in preparation.

The amendments will be introduced by Representative Julius Kahn, Republican of California, ranking member of the House Military committee. Representative Kahn is the father of the present draft act. Army officials are assuming that this is to be no short war, and every man who would not be more useful at home is needed to bear arms. Speakers soon will start a campaign, it is hinted, to bring these facts home to the people.

The amendments will provide that every man between 18 and 21 and 31 and 40 shall be registered for military service. It is estimated that this will give the government an additional 12,000,000 men to draw upon. The amendments provide, however, that youths while obliged to register upon attaining the age of 18, shall not be called to the colors until they are 21. Provision also is made that no man of more than 31 shall be called to the colors until all the present draft— from 21 to 31—is used up, and the boys who have attained the age of 21 since the June 5 registration shall also have been called.

Representative Kahn's plan would give America a reserve of 19,000,000 men to draw upon—all between 18 and 40. How to Address Letters to Soldiers in Europe. Making certain that letters will reach American soldiers now in active service in Europe is an easy matter if letter-writers will follow a few simple instructions, advises the Pennsylvania committee of Public Safety. There is a standard form of address for all men in the army service abroad and this is how the War Department wants all letters addressed (substituting the correct name, company and regimental or other designation in place of the one used here): John Smith, Co. K, 15th Infantry, American Expeditionary Forces.

Nov. 9.—"The Relation of Disease Bacteria to Milk."

"Because of the drought, you know how far below normal the rainfall has been for two years. I have made experiments of my own, to show the effect of the withdrawal of moisture, but I do not ask you to accept the record of them as proof, for the college has dozens of such records, made over a term of several years, proving that in time of drought it is the old leaves that fall first." It took the united efforts of Professor Hammond and his colleagues to convince Brunney. Ned Dean held out his hand. "You're a brick. I'll write that check before I leave this room. I say, John, you will make a man from whom the world will hear some day."

Trying on Her Risibles.

Louella saw the circus for the first time and sat through the performance as primly as if at church. "What was the matter?" her uncle asked the little lady later. "Why, the clowns," she explained. "I could hardly keep from laughing at them."—Everybody's Magazine.

A Man of Action.

She—I like a man of few words and many actions. He—You want my brother; he has St. Vitus dance.—Tiger.