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SUNDAY SCHOOL LESSON

Lesson III. Jan. 21, 1917.

First Disciples of the Lord Jesus. John 1: 35-51.

Commentary.—I. Following Jesus (vs. 35-39). 35. Again the next day... John the Baptist... "Behold the Lamb of God..."

36. Locking upon Jesus.—The verb has in it the thought of beholding with intense interest. Behold the Lamb of God!—Behold, the Lamb of God!

37. The nature and mission of Christ.—The following Jesus.—The two disciples were so impressed by the declaration the Baptist made...

38. What seek ye.—This was not asked to obtain information. It was a kind of inquiry respecting their desires; an invitation to lay open their minds, to state their wishes...

39. Come and see.—Jesus was not a heavy welcome. He recognized their sincerity and devotion. About the tenth hour—According to the Roman method of reckoning it would be ten o'clock in the forenoon...

40. One of the two... was Andrew... Andrew's name is the first mentioned in the list of Christ's disciples...

who knew the family. 46. Can there be any good thing come out of Nazareth.—The question implies either that Nazareth was an insignificant town...

47. Behold an Israelite indeed.—Jesus not only saw Nathanael as one man but another, but He also saw thoroughly his character. He noted that there was no guile, or deception, about him...

48. What did John the Baptist announce to you of his disciples concerning Jesus?—What surname did he address Jesus as "Rabbi"?—Who were the two disciples?—Whom did they go to seek?—What name did Jesus give to Simon?—What does the name mean?—Whom did Philip lead to Jesus?—What confession did Nathanael make?

49. Thou art the Son of God.—The bearing of Jesus together with the marvelous knowledge that He manifested drew forth from Nathanael this sincere and weighty confession. He declared that He was the Messiah and the long expected King of Israel, 50, 51. As great as was the mystery of how Jesus saw Nathanael under the fig tree...

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HOW TO MAINTAIN FERTILITY OF THE SOIL

Growth of Leguminous Crops, Conservation of Barnyard Manure, Application of Lime and Phosphatic Fertilizers Are the Four Essentials.

Every agricultural country so far as the fertility of its soil is concerned, passes four stages. The first stage is where the soil is virgin and yields crops bountifully. No manure or fertilizer of any kind is required, and indeed, on account of the richness of the soil, it would not pay to use them. The second stage is where the land has been depleted of a certain amount of its virgin fertility...

3. A heavy manure (vs. 51). 47. Behold an Israelite indeed.—Jesus not only saw Nathanael as one man but another, but He also saw thoroughly his character. He noted that there was no guile, or deception, about him...

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soluble and available for plant use. The organic matter in the manure furnishes the living bacteria in the soil with energy to work. The activity of Azotobacter and other nitrogen fixing bacteria is directly proportional to the amount of organic matter the soil contains.

Not only does manure enrich the soil with plant food and benefit the soil bacteria, but it has a very important physical effect. It loosens up heavy clay soils and makes them more easily worked. On the other hand, it makes loose sandy soils more compact. The desirability of an abundance of organic matter in the soil is noticed especially in dry seasons, when it will be observed that soils that are lacking in this respect dry out very quickly and become hard and crack. If lots of manure has been applied and the soil consequently has an abundance of organic matter, the moisture will be held—where it is held near the surface, in reach of the plant roots.

Barnyard manure does not make a "balanced ration," so to speak for plants. It is deficient in phosphoric acid. For this reason, when land has been worked for a number of years and the crop yield is not as large as was formerly, it pays to use phosphoric fertilizers. They should be used as a rule on the roots of corn. The application of from two to four hundred pounds of acid phosphate or basic slag per acre will generally prove profitable.

When land has been dressed regularly with barnyard manure for a number of years it becomes acid. Lim will correct this acidity. Expensive farmers in the older countries give their land a dressing of lime every few years.

There are three chief kinds of lime, viz.: lime carbonate or ground limestone, slaked lime, and gypsum. The lime carbonate or ground limestone is the kind that should be used in most cases. It is far cheaper than the slaked lime and moreover is a good deal cheaper.

Gypsum, or sulphate of lime, is found in beds or deposits, in various parts of the Dominion. When pulverized, it is very commonly called land plaster. It is a valuable source of lime, but the compound is more soluble in water than the carbonate of lime, but it does not neutralize the acid of our soils as do the lime carbonate and slaked lime. In other respects, gypsum or land-plaster may substitute lime, and bring more soil life per acre. It also contains some sulphur, which some authorities now think may have a special value in the soil.

Ground limestone may be applied at almost any time of the year. Freshly slaked lime, especially if the soil is very sour and a heavy application is required, it perhaps best applied in the fall. It is the surface soil that

needs the lime most, consequently, it should not be plowed down. In considering the amount of the various forms of lime that should be applied, it is well to remember that the equivalent of pure quick lime is the equivalent of 90 pounds of pure carbonate of lime. That is, 50 pounds of fresh lime or 74 pounds of slaked lime will have the same general effect in the soil as 100 pounds of ground limestone. While not quite accurate, one ton of quicklime may be considered equal to two tons of the carbonate. However, the character of the soil should be taken into consideration in deciding which material to use. Carbonate or lime, that is, ground limestone and marl, is much milder in its action than the freshly slaked lime, any is therefore the better material to apply where rapid action is not an important point, and especially on light sand and gravelly soils. These soils are usually poor in organic matter, due to the free oxidation induced by their open porous nature. Freshly slaked lime is generally credited with hastening this oxidation and on light soils would thus cause too rapid a dissipation of this valuable material. On heavy clays, freshly slaked lime may be used to advantage. There is not the same fear of its hastening the decay of the organic matter, and its action in causing flocculation of the clay particles will be more rapid and the improvement in the physical condition of the soil more quickly obtained. On soils between the sands and clays, especially in other countries indicate that the carbonates may be made on clays to give the best results through a number of years, although the returns for the first year or two may be in favor of fresh burned lime.

AMOUNT OF LIME TO APPLY.—For mucks and peaty soils that may be decidedly acid, the fresh slaked lime is to be preferred. The amount of lime that should be applied naturally varies with the nature of the soil, and the degree of acidity. We have generally recommended one ton of fresh lime or two tons of ground limestone, per acre. This is probably enough for light soils that are not very acid, but experience is showing us that much heavier applications may be made on clays that show acid with limus paper. Too heavy dressings with fresh lime tend to sterilize the soil for a time, that is, the lime checks the life process of organisms within the soil. There is, however, no fear of this with the carbonate of lime. On light soils it is safe to apply from one to two tons of the ground limestone, and on clay the same amount of the fresh lime. But in some cases the clays may be so sour that much heavier applications are required to neutralize the acid present and give the maximum results.

—Canadian Countryman.

MARKET REPORTS

TORONTO MARKETS.

Table with columns for various market items like Butter, Eggs, and other commodities with their respective prices.

Table with columns for various market items like Pork, Beef, and other commodities with their respective prices.

Table with columns for various market items like Sugar, Flour, and other commodities with their respective prices.

Table with columns for various market items like Grain, Oil, and other commodities with their respective prices.

Table with columns for various market items like Wool, Hides, and other commodities with their respective prices.

Table with columns for various market items like Lumber, Iron, and other commodities with their respective prices.

Care With Ashes. During the winter months the disposal of ashes from stoves and furnaces demands attention. Though many fires are caused by the disposition of hot ashes against frame buildings, wooden fences, etc., the practice is still continued.

PECULIARITIES OF HIGH EXPLOSIVES

It is now realized that armies in the field are using many different kinds of explosives, of which the most consists of nitrocellulose, manufactured from cotton. For this purpose, as the late Sir William Ramsay pointed out, the firing of a heavy cannon is converted by the action of nitric acid into a gelatin-like material, which may or may not be combined with nitro-glycerine. It is a frequent mistake to suppose that nitro-glycerine supplies the propulsive force of modern ammunition, which has been found, on the contrary, that it is inferior to some other explosives, while it has certain objections, such as the space it occupies, and its tendency to explode when struck or when a concussion takes place near it, as during the firing of a heavy cannon.

Cotton, however, is not the only form of woody fibre from which nitrocellulose can be made. Wood pulp, straw and substances like coke dust, have been used, for example, in Austria, but these substitutes have various drawbacks. First, they have the defect mentioned before of occupying too much space and, secondly, they ignite too quickly, and thus the pressure raised so suddenly that they cannot be used to explode a shell from a gun. They are manufactured for other purposes, however, being excellent explosive material for shells, since they are not so easily made to explode as gun-cotton is, and because this property enables them to pass through the barrel of a gun without exploding; whereas the concussion of firing, as Sir William Ramsay says, is apt to explode a shell filled with gun-cotton.

Another objection to nitrocellulose prepared from straw or wood pulp is that, though it possesses similar properties to gun-cotton, the powders made from it have not the same propulsive power as has an equal weight of gun-cotton, from which it is apparent that a bullet propelled with one of these substitutes will not have the same velocity as one propelled by an equal weight of gun-cotton. It is probable, however, owing to the great demand for explosives that much nitrocellulose made from wood pulp is now being

used, and as it will be necessary to compress it into a smaller bulk, its guns already designed for gun-cotton there is a new danger due to this confinement. Whether this confinement of nitrocellulose could have been one of the causes of the explosion in New York City, of course, more is conjectured, but it is quite likely that some circumstances like the compression of explosives may have been a contributing cause. It will be noticed that there were several explosives reported. The concussion produced by a single explosion would initiate a state of the elements of such substances as mercury fulminate or picric powder sufficient to cause their detonation. A condition of things which would immensely increase the unstable properties of high explosives like trinitrotoluene and picric acid, or twice not easily made to explode by burning or ordinary percussion.

Now the packing or confinement of explosives, as in railway cars and barges, can produce other effects that heighten the danger of what may be called spontaneous explosion. If these explosives should contain picric acid, there is the danger that compounds of a highly explosive nature will be formed. Picric acid, for example, forms a very explosive compound with lead and has a tendency to explode by burning or ordinary percussion.

In the present war picric acid is used on a great scale. It is reported that lyddite shells were stored in barges in the harbor. Lyddite is picric acid, either uncombined—that is, mixed, say, with other substances—or molten and "cast" picric acid. Cast picric acid is a treacherous substance that has a reputation for stability. In fact, there are chemists who say that it is the safest explosive for transport. This is quite a mistake. The French have found that it has an unstable nature, sometimes exploding after a very slight concussion, though at others it requires a considerable detonation to make it separate into its gaseous elements.

An expert of the "Conservatoire des arts et metiers" describes it as the perfect type of explosive. He means that in ordinary circumstances it does not explode under violent shocks, and it is not easy to ignite. But there appears to be no absolute security for this stability. "Without any apparent reason," he writes significantly,

Souvenir for Germans. "Bike" Evans, former Brantford ball player at the front line, none of his old nerve. The story has come out that recently "Bike" crawled over to a German dug-out and called out with a German salute and called out with a German salute. "How many are there of you down there?" The answer came back in good English: "Eight of us." "Then divide these among you," called Evans, and with that he hurled in two hand grenades, and in the confusion made his way back uninjured.