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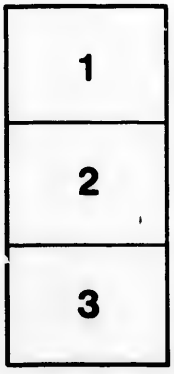

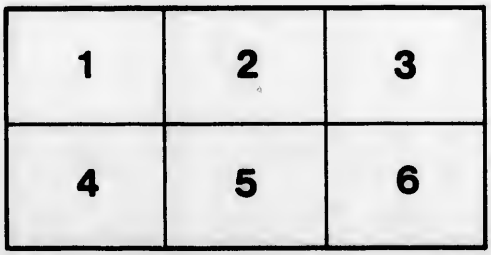

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ANSWERS

TO THE

PROGRAMMES

ON

TEACHING & AGRICULTURE,

FOR

ELEMENTARY SCHOOL, MODEL SCHOOL

AND

ACADEMY DIPLOMAS,

BY

Revd. JEAN LANGEVIN.

First English Edition,

APPROVED BY THE

COUNCIL OF PUBLIC INSTRUCTION.

Quebec:
PRINTED BY C. DARVEAU, 8, MOUNTAIN STREET.

1864.

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APPROBATION

BY THE

COUNCIL OF PUBLIC INSTRUCTION.

(*Translation.*)

EDUCATION OFFICE,
Montreal, 17*th December* 1863.

REVD. M. LANGEVIN,
Principal.
Laval Normal School, Quebec.

SIR,

I have the honor of informing you that your "Answers to the Questions on the art of Teaching and Agriculture (new edition, French and English)" have been approved by the Council of Public Instruction at their sitting of the 10th november last, and that such approval has been sanctioned by His Excellency the Governor General, as it appears by an Order in Council, bearing date the 5th december instant.

I have the honor to be,
Sir,
Your obedient servant,
(Signed) P. J. O. CHAUVEAU,
Superintendent of Education.

Entered according to the Act of the Provincial Legislature in the year of our Lord one thousand eight hundred and sixty-two, by Reverend JEAN LANGEVIN, in the Office of the Registrar of the Province of Canada.

ANSWERS

TO THE

PROGRAMME

ON

THE ART OF TEACHING

FOR

AN ELEMENTARY SCHOOL DIPLOMA.

SCHEDULE F. No. 6.

I.

1. What is education?

Education is the art of exercising, developing and strengthening the faculties of the body, mind and heart of children.

2. What is teaching?

Teaching is the means of imparting instruction to children.

3. What natural talents should a teacher possess?

The natural gifts, necessary to a teacher, are the physical and intellectual qualities that he should possess.

The principal physical qualities, necessary to a teacher, are: clearness of sight and hearing, a suitable voice, a distinct pronunciation, sound lungs, and a sufficiently good health. The principal intellectual qualities are: a good memory, a correct judgment, a well regulated imagination and great tact.

4. What should the moral qualities of a teacher be?

The principal moral qualities of a teacher are: religion, piety, humility, gravity, gentleness, firmness, patience, activity, prudence, discretion, equity, zeal and sobriety.

Religion teaches him to revere God and his ministers; piety renders him exact to his religious duties; humility preserves him from self-sufficiency and pedantry; gravity causes children to respect him, and gentleness, to give him their affection; firmness helps him in maintaining necessary discipline; patience gives him capacity to support the pupils' defects; activity puts life in his teaching. By prudence, he watches over his acts; by discretion, he minds his words and writings; by equity, he avoids wrongs; zeal impels him to the accomplishment of his task with taste and ardour; finally, sobriety preserves him from the degrading vice of intemperance.

5. What is the end aimed at in teaching?

The teacher's aim in imparting instruction should be to give children useful and practical knowledge, whilst he exercises and develops their understanding.

6. Explain how education should be at once physical, intellectual and moral.

The child having a body, a mind and a heart, education, in order to be complete, should be at once physical, intellectual and moral.

Physical education gives strength and suppleness to the limbs of the child; teaches him to make good use of his senses, to have a suitable demeanor and to keep himself clean; it contributes also to the preservation of health by hygiene.

Intellectual education should exercise the memory of the child, correct his judgment, regulate his imagination, and accustom him to observation and reflexion.

Moral education represses in the child defects of character, develops virtues in his heart, bends him to discipline, and gives him the rules of good breeding.

7. What is the true basis upon which to rest school discipline?

True discipline in a school is founded on the sentiment of duty in the minds of children, and on a great respect, mixed with affection, for the master; on the part of the latter, it is founded on tact, moderation, gravity and a constant supervision.

8. In what manner can a teacher succeed in gaining a knowledge of his pupils' dispositions?

A teacher can attain a knowledge of his pupils, 1° by studying his own heart; 2° by observing the children a great deal, but without their knowledge; 3° by putting them at ease, in order that they dream not of hiding their character.

9. What is the best way to teach children obedience?

The best manner to teach children obedience is to make them feel that what we command is just, reasonable, and conformable to their true interests.

II.

10. What is the individual system of teaching?

The individual system consists in teaching each pupil separately.

11. What is the simultaneous system of teaching?

The simultaneous system consists in teaching a whole class of children at once.

12. What is the mutual system of teaching?

The mutual system consists in dividing the children into groups, and confiding these groups to the care of some of the more advanced pupils, who bear the name of *monitors*.

13. What is the mixed or simultaneous-mutual system of teaching?

The mixed system of teaching, or the simultaneous-mutual, is that in which the master himself teaches each group successively, while the other groups are under the control of monitors.

14. What are the advantages of the simultaneous and simultaneous-mutual systems over others?

In the simultaneous and simultaneous-mutual systems, it is easier to maintain discipline and to excite emulation among children; the teacher instructs them himself, during the necessary time; finally, scholars profit by all that is said and done in class.

15. How can a teacher render his lessons attractive to children?

The teacher should render his instruction attractive, by taking himself much interest in it, by avoiding monotony in tone and method, by varying the exercises, and intermixing his explanations with questions, examples, applications, and sometimes anecdotes.

16. Why is it necessary to arrange the matter taught systematically, even when it is of the most elementary character ?

The subjects to be taught should be arranged so as to give to each of them a time proportionate to its nature and importance, and that children may be better prepared for their classes.

17. Why must the teacher advance from the *known* to the *unknown* ?

The teacher should habitually proceed from the *known* to the *unknown*, because it is the most natural method, which makes children seize more easily the knowledge of things, and teaches them better to draw consequences from what they already know.

18. In what manner should questions be put to children ?

The questions should be put, 1° clearly and in terms which cause no equivocation ; 2° lively ; 3° under greatly varied forms ; 4° in a methodical manner ; 5° more frequently to one pupil in particular, sometimes to the entire class.

III.

19. What is the best method to teach children the letters ?

The best method to teach children the alphabet is, 1° to teach them but few letters at once ; 2° to show these letters on a tablet, in order to speak the better to the eyes ; 3° to make children remark well their sounds and forms.

20. What is the best method to teach children how to spell ?

The best method to teach spelling (following the old method) is, 1° to make children pronounce every letter very distinctly ; 2° to make them unite successively each syllable, then the entire word ; 3° to make them spell a great deal by heart ; 4° to begin by the shortest and easiest words. They may also be taught to pronounce the syllables without spelling them, according to the new method.

21. What is the best method to teach children to read well ?

To teach children to read well, it is necessary, 1° to make them observe the pauses indicated by the signs of punctuation ; 2° to aim not at how long they read, but that they read correct-

ly; 3° to forbid them to read too quick or too slowly; 4° to make them take a moderate tone of voice, neither piercing, languishing, singing, nor monotonous; 5° to make them often repeat the same sentences.

We should also make children read with understanding, and for that purpose, explain to them the meaning of rare or difficult words, and the sense of phrases, and afterwards require from them an account with an explanation of what they read.

22. What is the best method to teach children how to write?

To teach calligraphy, it is necessary 1° to attend to the position of the paper, of the body, of the arms, the hands, the fingers and the pen; 2° to accustom the pupils to have their writing very regular in relation to its length, its inclination and the width of letters and words; 3° to make them begin by strokes, then by the easiest large letters; 4° to make them write at first in text, then in half text, and lastly in small hand; 5° to oblige them to always imitate the example and preserve great cleanliness in their copy-books; 6° to require that all the exercises be carefully written; 7° to give them a good practical hand.

23. What is the best method to teach children how to cipher?

To teach calculation, it is important for the master, 1° to begin by teaching children to write and read numbers; 2° to make them recite the tables of addition, of subtraction, of multiplication, of monies, weights, measures, &c.; 3° to advance but gradually; 4° to give himself examples on each new rule before requiring children to solve any of the problems; 5° to accustom pupils to be very methodical in their operations of calculation, and to perform them in a loud voice, each in turn.

24. What is the best method to teach children orthography?

The best way to teach *usual* orthography to children is 1° to make them often spell by heart; 2° to give them frequent dictations, which they correct immediately according to the indications of the master; 3° to make them recommence until these dictations become exempt from faults.

For *grammatical* orthography, we should 1° give every day to the children some exercises to correct, corresponding to the rules of

grammar which they study; 2° make them often write sentences on the black board; 3° habituate them to parse, that they may become competent to apply all the rules.

25. What is the best method to teach children geography?

In teaching geography, we should always explain in advance the subsequent lesson to children, habituate them to show correctly the places on the map (and not only the names), to point out carefully the boundaries of countries, the course of rivers, &c., and to know well the latitudes and longitudes. It is also very useful to make them frequently repeat the definitions, and to make them understand the importance of geography.

IV.

26. What should be the aim of the teacher in distributing rewards and punishments?

The general aim of rewards should be to encourage those who receive them, to excite emulation among them, and to entice others to endeavor to merit some also.

The general aim of punishments should be to procure the amendment of the guilty and the general welfare of the pupils, by preventing similar faults in future by the fear of chastisements.

27. What faults deserve most to be punished?

The faults that should be particularly punished, are: 1° those which are directly against the law of God; 2° those which are committed deliberately and with reflexion; 3° the faults of habit.

28. What is most deserving of reward?

We should particularly reward labor, application, quietness, assiduity, docility and regular conduct.

29. What is the duty of a teacher towards parents?

The teacher should endeavour to inspire children with great respect and obedience towards their parents, and never speak of the latter before them but with a great deal of regard. He should nevertheless conduct his school with independence, at the same time acting with prudence and moderation.

30. What should be the bearing of teachers towards the civil and religious authorities ?

The teacher should give example of submission to the civil authorities in all that is just and under their jurisdiction.

He should especially testify much respect for the scholastic authorities in all that is reasonable, particularly for the Superintendent of Education, the School Inspector and the Commissioners.

The teacher should consider as of the highest importance, on all sides, to preserve a perfect agreement with the religious authority. He should therefore, on all occasions, show a profound respect for his priest (or minister), ask his advice, receive it with docility and gratitude, and promote his views for the benefit of the children.

31. What are the responsibilities of teachers towards the public ?

The teacher should avoid taking any active part in the divisions that may exist in the parish in which he is employed. He should at the same time endeavour to acquire general esteem by irreproachable conduct, great modesty and politeness, and render himself useful according to the extent of his knowledge and the means at his disposal.

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ANSWERS

TO THE

PROGRAMME

ON THE

ART OF TEACHING

FOR

A MODEL SCHOOL DIPLOMA.

SCHEDULE G. No. 12.

I.

1. What is the Art of Teaching?

Teaching is the art of conducting, bringing up and instructing childhood and youth. It comprehends *direccion* of a class, *education* and *instruction*, in theory and practice.

2. Upon what basis does this science rest, and what are its principles?

The principles of Teaching are founded on the knowledge of the nature of children and on the experience of the best teachers.

3. What particular qualifications should a teacher possess?

Among the particular qualifications which a teacher should possess, ought to be numbered: great morality, probity, disinterestedness and devotedness.

4. What is Education?

Education is the art of exercising, developing and strengthening the faculties of the body, mind and heart of children.

5. What is instruction ?

Instruction is the art of adorning the minds of children with knowledge, by means of teaching.

6. What relation does instruction bear to education ?

There are very close relations between instruction and education, as they are completive of each other. Instruction might even become very pernicious, if not accompanied by moral and religious education. The first then should never be separated from the second.

7. Why should education be at once physical, moral and intellectual ?

The child having a body, a mind and a heart, education, in order to be complete, should be at once physical, intellectual and moral.

8. What is physical education ?

Physical education gives strength and suppleness to the limbs of the child; teaches him to make good use of his senses, to have a suitable demeanor and to keep himself clean; it contributes also to the preservation of health by hygiene.

9. In how far should a teacher look to the physical education of his pupils ?

A teacher should look to physical education, as holding the parents' place. He should above all endeavour to give children a good deportment, teach them to employ their senses well, and direct the sports in which they are engaged during the recess.

10. What means should be employed to develop the understanding of children ?

To develop the understanding of children, we must accustom them to observe well and to render an account of what they learn.

11. To what degree should a teacher develop the feeling of *sensitiveness* in his pupils ?

The teacher should not develop sensitiveness too much in children; he should on the contrary endeavour to modify those sensibilities, by bringing into activity their reflective powers and removing all tendency to effeminacy.

12. How should the power of *volition* be strengthened in children ?

We strengthen the power of volition in children, by habituating them to submit to discipline, to resist their natural tendencies, and to show moral force and energy of character in critical or painful circumstances.

13. What is the groundwork of moral education ?

Moral education has for its basis the law of God, the sentiment of duty and of honor.

II.

14. What should be the aim of the teacher in imparting instruction ?

The teacher's aim in imparting instruction, should be to give children useful and practical knowledge, whilst he exercises and develops their understanding.

15. Show the utility of a fixed system of study in the school.

It is necessary for the teacher to have a fixed system of study, in order to devote a suitable time to each matter, that the exercises may be better varied, that there may be less time lost in passing from one subject to another, and lastly, that the children may be better prepared for their classes.

16. What essential advantages ought this system to have ?

The system of study, adopted by a teacher for his school, should not be too complicated, should allow to each matter the time that its nature and importance require, and should be proportioned to the number of years that the children pass at school.

17. How should the teacher prepare himself for his class ?

The teacher should make two sorts of preparation for his classes, a general and particular preparation.

By a general preparation, must be understood the care of the teacher to devote a certain part of each day to study, particularly to that of the matters which he is called to teach.

By particular preparation, is meant the care that the teacher should have to study beforehand the following lesson, the mode of explaining it, the examples intended to illustrate it, and the applications to be given to children.

18. What are the faults which a teacher should not tolerate in his school ?

The principal faults which a teacher should banish from his school, are : immorality, lying, dissimulation, stealing, idleness, pride, insubordination, rudeness, uncleanness and dissipation.

19. Upon what principles is true discipline founded ?

True discipline in a school is founded on the sentiment of duty in the minds of children, and on a great respect mixed with affection for the master ; on the part of the latter, it is founded on tact, moderation, gravity and a continual supervision.

20. What duties devolve upon a teacher when in presence of his class ?

During class, the teacher should have a demeanor that inspires respect, exercise a constant supervision, keep the children always occupied, lose not an instant and preserve a perfect equality of temper.

21. How can a teacher secure obedience, order and silence ? How can he impart habits of cleanliness ? How should politeness and purity of manners be taught ?

I. The best manner to teach children obedience is to make them feel that what we command is just, reasonable and conformable to their true interests.

II. To secure order and silence, the teacher should himself have a great deal of method and moderation, speak usually in an ordinary voice, keep the children always busy and attentive, and recompense quietness.

III. To impart habits of cleanliness to children, the teacher should keep his class very neatly, give example himself of cleanliness, make them understand the advantages of it for health, make each day an examination of cleanliness for the head, the hands and clothes, lastly, order the children to be very careful of their books and copy-books.

IV. Modesty may be obtained from children, by reminding them that talent comes from God, who will one day demand an account of it, by making them perceive the charms of modesty, and by accompanying praises and rewards with a few words calculated to prevent pride.

Purity of manners in children, which is also called modesty, may be preserved by keeping a constant supervision over their company, their conversation and reading, and by inducing them to remember always God's presence.

V. The teacher can obtain politeness from children, by being himself very polite towards them, by explaining the rules of good breeding to them, by recommending them much respect for one another, and by exacting from them great civility in action and language.

22. How can pupils be made attentive in school ?

The best means to render pupils attentive in school are : 1° to change often the exercises ; 2° to vary frequently the form and tone of explanations ; 3° to question unexpectedly, sometimes individually, sometimes simultaneously ; 4° to address oneself to the eyes, as well as to the ears of children ; 5° to promise them, as a reward of their attention, some interesting anecdote or some object lesson at the end of the class ; 6° to render teaching attractive by showing much interest in it.

III.

23. What should the bearing of the teacher be towards the weak and the strong of the same class ?

The teacher should not pass too rapidly from one thing to another, because the weak scholars could not follow him; he should not, on the contrary, advance too slowly, seeing that this would be an injustice towards the more advanced ones : he ought to conform to the capacity of the greatest number. If he could even separate the class into several divisions, he should do so.

24. What is the *explanatory* method of teaching ?

The explanatory method consists in explaining a subject to children by going from the simple to the compound, from principles to consequences; it is also what we call *synthesis*.

25. What is the *exhibitory* method of teaching ?

The exhibitory method consists in making children themselves find out the things required, and proceed from consequences to principles, from applications to rules ; this is also called *analysis*.

26. What peculiarities does each of these methods offer?

The explanatory method is better adapted for the first explanations on a subject, gives more regular ideas of it, and exercises better the memory.

The exhibitory method is better suited to ascertain if the children have well understood what has been explained to them and obliges them to reason more: therefore it exercises more the intellect.

27. How should the subjects be arranged?

The subjects to be taught should be arranged according to the nature of the school, the age and capacity of the pupils, the importance of each branch of study, and the time it requires, daily or weekly.

28. What are the advantages obtained by proceeding from the *known* to the *unknown*,—from the *simple* to the *compound*?

The teacher should habitually proceed from the known to the unknown, because it is the most natural method, which makes children seize more easily the knowledge of things, and teaches them better to draw consequences from what they already know.

29. What are the qualifications requisite to become a successful expositor?

The explanation of matters should be, 1° *clear*, that is, easily understood; 2° *methodical* and *graduated*, that is, given in a regular and natural order; 3° placed within reach of the children and in relation to their age and advancement; 4° comformable to the nature of the school that one holds; 5° interrupted by questions suitably made; lastly, rendered comprehensible and interesting by examples, exercises and applications.

30. What is the best method of questioning?

The questions should be put, 1° in a clear manner and in terms which cause no equivocation; 2° lively; 3° under greatly varied forms; 4° in a methodical manner; 5° more frequently to one pupil in particular, sometimes to the entire class.

31. How should children be taught to remember *things*, and how should they be taught to remember *words*?

To teach children to remember things, we must accustom them

to give an account of what they read aloud, or what they hear during class, as well as of the objects which they encounter, and which they should be accustomed to remark.

To teach them to remember words, it is useful to make them learn regularly by heart lessons of a reasonable length, and pretty often interesting selections, as a piece of poetry adapted to their age. But this memory of words should be always accompanied by the memory of things.

IV.

32. What does the individual system of instruction consist in ?

The individual system consists in teaching each pupil separately.

33. What does the simultaneous system of instruction consist in ?

The simultaneous system consists in teaching a whole class of children at once.

34. What does the mutual system of instruction consist in ?

The mutual system consists in dividing the children into groups, and confiding these groups to the care of some of the more advanced pupils, who bear the name of *monitors*.

35. What are the advantages and defects of each system ?

The individual system has for its advantage, that the teacher can more easily adapt his method to the capacity of each child. Its defects are : that it is more tiresome for the master ; that it permits him to devote but very little time to the instruction of each child ; that it presents many difficulties in the maintenance of discipline ; finally, that it can by no means excite emulation among scholars.

The simultaneous system has for its principal advantages : 1° to oblige the master to fewer repetitions ; 2° to make the children profit by all that is said and done in the class ; 3° to powerfully excite emulation among them. It has the disadvantage that the explanations are not proportioned to the capability of all the scholars.

The mutual method has, lastly, the advantage of keeping all the children of the school continually occupied at once. But it

presents serious inconveniences: 1° that the children of the divers groups are directed simply by monitors who are often insufficiently instructed, too frivolous, too inflated with their little authority, not impartial enough; 2° that the monitors have not sufficient time for their own study.

36. What are the essential characteristics of a good system?

The effects of a good system must be to keep children quiet and attentive, to excite a laudable emulation among them, to husband time, to preserve the teacher's health and to promote the constant progress of the pupils.

37. What system is the most advantageous for the greatest number of schools?

The *mixed* system is the most advantageous for the greatest number of schools. The mixed system of teaching, or the simultaneous-mutual, is that in which the master himself teaches each group successively, while the other groups are under the control of monitors.

In the simultaneous and simultaneous-mutual systems, it is easier to maintain discipline and to excite emulation among children; the teacher instructs them himself during the necessary time; finally scholars profit by all that is said and done in class. But the teacher must carefully prepare the monitors for the performance of their task.

38. What method may be adopted in teaching children the alphabet?

The best method to teach children the alphabet is, 1° to teach them but few letters at once; 2° to show these letters on a tablet, in order to speak the better to the eyes; 3° to make children remark well their sounds and forms.

39. What method should be adopted to teach spelling?

The best method to teach spelling (following the old method) is, 1° to make them pronounce every letter very distinctly; 2° to make them unite successively each syllable, then the entire word; 3° to begin by the shortest and easiest words; 4° to make them spell a great deal by heart. They may also be taught to pronounce the syllables without spelling them, according to the new method.

40. What method should be followed to teach calligraphy ?

To teach calligraphy, it is necessary, 1° to attend to the position of the paper, of the body, of the arms, the hands, the fingers and the pen ; 2° to accustom the pupils to have their writing very regular in relation to its length, its inclination, and the width of letters and words ; 3° to make them begin by strokes, then by the easiest large letters ; 4° to make them write at first in text, then in half text, and lastly in small hand ; 5° to oblige them to always imitate the example and preserve great cleanliness in their copy-books ; 6° to require that all the exercises be carefully written.

41. How should children be taught the elements of orthography ?

The best way to teach *usual* orthography to children is 1° to make them often spell by heart ; 2° to give them frequent dictations, which they correct immediately according to the indications of the master ; 3° to make them recommence until these dictations become exempt from faults.

For *grammatical* orthography, we should 1° give, every day, to the children some exercises to correct, corresponding to the rules of grammar which they study ; 2° make them often write sentences on the black-board ; 3° habituate them to parse, that they become competent to apply all the rules.

42. According to what method can grammar and arithmetic be taught ?

Grammar can be taught by synthesis and analysis. We at first clearly define the part of speech in question, explaining carefully all the words that the definition contains. We then give successively the different rules, illustrating them by well chosen examples and graduated exercises.

For ascertaining if the pupils have understood and retained the rules, we accustom them to grammatical parsing, which we make them practise in a graduated and methodical manner. When they are older and more advanced, it is very useful to teach them logical analysis.

To teach calculation, it is important for the master 1° to begin by teaching children to write and read numbers ; 2° to advance

but gradually; 3° to give himself examples on each new rule, before requiring the children to solve any of the problems; 4° to accustom pupils to be very methodical in their operations of calculation, and to perform them in a loud voice, each in turn.

43. What importance do you attach to mental arithmetic?

Mental calculation is very important to exercise the memory of children, to accustom them to remember dates, and make them perform rapidly many customary and practical operations in arithmetic.

44. In teaching geography and history, should it be your aim to exercise the memory or the intellect of pupils?

In teaching geography and history, it should be our aim to exercise as well the intellect as the memory. Thus, in geography, we shall ask children the route to be followed from one place to another, the different objects of exchange between certain countries, the position of mountains known from the course of rivers, &c. Mute maps are preferable for pupils already advanced.

To teach history well, it is necessary 1° not only to make children learn it by heart, but also to habituate them to relate it in their own phraseology; 2° to make them point out on the map all the places mentioned in the lesson; 3° to accustom them to distinguish the principal facts with their dates, from secondary facts; 4° to make them recapitulate pretty often, in order that they may well connect facts with one another.

45. What are *object lessons*, and to what subjects may these lessons extend?

We mean by *object lessons* details given by the teacher on different objects and intermingled with questions addressed to the pupils. These lessons can have for principal subject the most ordinary objects in a school, in any house whatever, in the labors of agriculture, as well as those belonging to the different kingdoms of nature, such as animals, plants, minerals, &c.

46. How should a teacher impart instruction about common things?

The teacher can impart instruction to children about common things by giving explanations on these things, 1° when the names of them are met in reading-books, in geography, history, &c.;

2° during the walks that he can sometimes take with them; 3° during object lessons.

V.

47. What should the object of all rewards and punishments be?

The general aim of rewards should be to encourage those who receive them, to excite emulation among them, and to entice others to endeavour to merit some also.

The general aim of punishments should be to procure the amendment of the guilty and the general welfare of the pupils, by preventing similar faults in future by the fear of chastisements.

48. In what manner should a teacher have recourse to rewards and punishments?

He should serve out rewards and punishments to children with parsimony; the former, as tokens of satisfaction and encouragement to accomplish faithfully their duty; the latter, as an extreme measure and last means to prevent or repress evil.

49. What do you understand by positive punishment and natural punishment?

By *positive* punishment I mean that which is imposed by the will of the teacher; by *natural* punishment, that which necessarily results from a fault, for instance, shame, ignorance, loss of esteem, the displeasure of parents, &c.

50. In awarding punishment should the intention or outward action be considered?

In awarding punishment not only should the outward action of the guilty be considered, but also and especially the intention, as far as we can know it, since the latter alone determines the morality of the action and the degree of culpability.

51. Should any fault be left unpunished?

A great number of faults should be left unpunished, namely, those which proceed only from levity and want of reflexion, and are not sufficient to introduce disorder into the class.

52. How and when should punishment be awarded?

Punishments should be 1° scarce enough to make impression;

2° given with coolness and moderation ; 3° in a manner not to wound modesty or injure the health of children.

53. What is deserving of reward ?

We should particularly reward labor, application, quietness, assiduity, docility and regular conduct.

54. What should be the nature of rewards ?

The rewards given to children should be : 1° signs of approbation ; 2° tokens of confidence ; 3° good places, good notes and good points ; 4° inscription on the list of honor ; 5° some mark of distinction ; 6° pictures and books adapted to the kind of school, to the age and advancement of children. Scholars should be taught to esteem these objects, not on account of their intrinsic value, but in relation to the motive for which they are given.

55. How and when should rewards be given ?

Rewards should be given often enough to encourage children, but not so often as to become indifferent to their sight.

In rewarding we should carefully avoid committing injustice, provoking among children hatred or envy, lastly, over-exciting their self-love.

VI.

56. What objects should a school-house be provided with ?

A school-house should be specially provided : 1° with means of ventilating the class and maintaining a moderate temperature ; 2° a sufficient number of windows to light it well ; 3° with a crucifix (for catholic schools) ; 4° with a stage and a teacher's seat and desk ; 5° seats with backs and desks for the pupils ; 6° black boards and geographical maps ; 7° with a clock and handbell ; 8° with globes for model schools ; 9° with crooks to hang up the clothes and head-dresses.

57. What are the duties of the teacher towards the school commissioners ?

The teacher should manifest much respect for the school-commissioners in all that is reasonable, and furnish them with all the requisite information about his class.

58. What are the obligations of the teacher towards the minister of religion ?

The teacher should, on all occasions, show a profound reverence for his priest (or minister), ask his advice, receive it with docility and gratitude, and promote his views for the benefit of the children.

59. What are the responsibilities of the teacher towards the parents of his pupils ?

The teacher should endeavour to inspire children with great respect and obedience towards their parents, and never speak of the latter before them but with a great deal of regard. He should nevertheless conduct his school with independence, at the same time acting with prudence and moderation.

60. What are the responsibilities of the teacher towards the public ?

The teacher should avoid taking any active part in the divisions that may exist in the parish in which he is employed. He should at the same time endeavour to acquire general esteem by irreprochable conduct, great modesty and politeness, and render himself useful, according to the extent of his knowledge and the means at his disposal.

ANSWERS

TO THE

PROGRAMME

ON

AGRICULTURE

FOR

A MODEL SCHOOL DIPLOMA.

SCHEDULE G. No. 18.

I.

1. What is Agriculture ?

Agriculture is the art of cultivating the land in a manner to obtain economically from it beneficial results.

2. What advantages does Agriculture offer ?

As an occupation, Agriculture presents the following principal advantages : 1° of being very important to a country ; 2° salubrious ; 3° substantial and certain ; 4° independent and honorable ; 5° very favorable to the preservation of morals.

3. What knowledge is necessary to be a good agriculturist ?

To be a good agriculturist one should understand : 1° reading and writing ; 2° the elements of arithmetic ; 3° the rudiments of natural philosophy, of mechanics, of chemistry and of natural history.

He should also know the divers kinds of soils and of seeds, and the use of improved implements.

He should also possess regular conduct, health, activity, prudence, economy, perseverance, and habits of order and observation.

4. Why is a knowledge of the different kinds of soil necessary?

It is important to know the different kinds of earth which compose a soil, in order to know the use to be made of it; the manner of draining and preparing it, and the plants it is preferable to cultivate in it.

5. Point out the qualities of the different sorts of soil, and the plants they are best adapted to produce.

A *compact soil* is that in which *clay* or *argil* prevails; it is cold and tenacious. It is known because it cracks by the drought and the water sejourns on its surface. Its advantages are: that it preserves its freshness better, offers a more solid basis to the roots, and retains longer the fertility which manure has communicated to it. Its disadvantages are: that it retains too much moisture in time of rain, cracks and hardens too much in time of drought. Wheat, oats, beans, beets, as well as trefoil, thrive well in it.

We call *light soil* that which is composed chiefly of sand or carbonate of lime (matter from which lime can be extracted). The advantages of a sandy soil are: that it dries quicker, that plants spring up and ripen in it sooner, and that it is more easily and cheaply cultivated. Its defects are: to dry up too rapidly, to retain little fertilizing matters, and to expose plants too much to the sudden variations of temperature. Barley, rye, buckwheat, turnips and potatoes thrive well in it.

The advantages of carbonate of lime in the soil are: of rendering heavy land more mellow, more friable, and consequently easier to cultivate, and of giving more consistence to a light soil, and by this means also of facilitating its cultivation. Carbonate of lime further augments the quality of certain produce. Barley and sainfoin (French-grass) thrive well in a calcareous soil.

Lastly, the best earth is that which is composed of argil or clay, silica (sand and pebble-stones) and of carbonate of lime in suitable proportions, with about one twelfth of *humus*

(a name given to a dusky or brownish substance produced by the decomposition of animal or vegetable matters).

II.

6. What are the most advantageous means of improving the soil ?

The most advantageous means of improving the soil are :

1° *clearing*, which consists of putting in a state of cultivation, either a wild lot, or a woodland ;

2° *removal of stones*, which consists of taking out of the land the stones with which it is incumbered ;

3° *surface burning* (l'écobuage), which is done by heaping the surface soil and burning it ;

4° *draining* the land by delivering it from superabundant or stagnant waters ;

5° lastly, *amendments*, which consist in the mixture of certain substances with the soil, which (as lime, silicious marl and sand) render it mellow, if it is too compact, or which (as argil, clayey-marl and lime) render it more firm, if it is too friable.

7. What are the different fertilizers used to enrich the soil ?

The following are the different matters which can specially serve as *manures* (substances destined to enrich the soil) : 1° certain plants which we bury before they come to maturity, what we name *green* or *vegetable manures ;* 2° cakes of linseed, after we have extracted the oil from it ; 3° excrements and urines, which are called *animal manures* ; 4° *stable dung* or *mixed manures* ; 5° ashes ; 6° *composts*, formed of lime and clay mixed in beds with rubbish of every kind.

8. Why is it necessary to note the difference between hot and cold manure ?

It is necessary to distinguish hot from cold manure, because both do not equally suit all sorts of land. The former (excrements of man, of poultry, of horses and sheep) suits heavy cold land ; the latter (excrements of horned cattle) suits light sandy soils.

9. What care should be taken to prevent the deterioration of manure?

To have a good dung-heap, it is necessary 1° to pay great attention to animals' litter; 2° to place the dung-heap on a pavement, or at least on a bed of clay; 3° to take care that the liquid of the dung-heap be not lost, but frequently used to sprinkle the heap; 4° not to augment the dung-heap to too great a height (6 to 7 feet suffice); 5° to mind that it be not washed by water from the roof or from any stream; 6° when the heap has the desired height, to cover it with a bed of earth in order to prevent the evaporation of its fertilizing ingredients.

10. Of what utility is *plaster?*

Plaster is useful, 1° to be mixed in layers with dung in order to preserve the good qualities of the latter; 2° to be spread in powder over the soil, particularly over dry and warm land, or over pease, sainfoin, trefoil, &c., when they begin to spring forth, for accelerating vegetation as a *stimulant.*

11. What is *rotation of crops*, and what are the advantages secured by this system?

Rotation of crops is the order in which the divers productions of the same field succeed one another: it may consist of three, four....eight or nine years, &c. This succession of produce is highly necessary because, among plants, some serve to mellow the soil, others to cleanse it, some are ameliorating, others exhausting, &c. The effect of rotation should be to render to the soil what has been extracted from it.

12. What is the best system of *rotation of crops?*

The best system of rotation of crops is that which unites the following conditions: 1° to adapt the crops to the climate, to the nature of the soil, and to the resources whereof we dispose; 2° to make the crops follow in such a manner that some may prepare the success of the others; 3° between two exhausting crops (such as cereals), to place one or several ameliorating crops (such as weeded crops, sainfoin, trefoil, &c.); 4° to replace plants which dirty the land, by others which shade it strongly (as buckwheat, pease), or which require repeated cultures (root crops).

The following is an example of rotation :

1st. year.....Weeded and mucked plants, or fallow ground.
2nd. " Cereals with grass seed.
3rd. " Hay.
4th. " Hay.
5th. " Pasturage.
6th. " Oats or pease.

13. What is the utility of *drainage*, and how can it be effected ?

Drainage is necessary, because an excess of moisture prevents the action of manure, is injurious to the germination of seeds, favors weeds, endangers the crops, renders labor difficult and unwholesome, &c. Besides trenches, one makes, to drain a piece of ground, ditches which receive the superabundant waters and conduct them into some stream. These ditches can be filled with stones, between which the water flows, then covered with other larger stones and a bed of earth : this prevents loss of land, and hinders less the circulation in the fields. It is again preferable to place tiles made of burned clay at the bottom of these covered ditches. This method is called *tile-drainage*.

III.

14. What are the principal varieties of seed ?

The principal farm seeds are : 1° *cereals*, or farinaceous plants : wheat, rye, barley, oats, Indian corn, and buckwheat ; 2° *leguminous vegetables :* potatoes, carrots, turnips, beets, (roots) ; cabbages, pease and beans ; 3° *textile* plants : flax, hemp ; 4° *forage* plants : millet, trefoil, sainfoin, &c.

In gardens, the radish, onion, leek, garlic, scallion, melon, pumpkin, tobacco, besides several of the preceeding seeds.

15. Why is it necessary to select the grain carefully ?

It is highly necessary to choose the seed, that the crop, in the end, be more abundant, richer, and cleaner.

16. What means are usually employed to clean grain ?

Grain may be cleaned with the *winnowing-sieve* and the *riddle*.

If intended for seed, it might be cleaned even with the hand.

17. Name the principal agricultural implements.

The principal agricultural implements are: 1° the *plough*, which cuts and reverses the land in narrow slices (when the plough has no fore-wheel, it is called a *swing-plough*); 2° the *harrow*, to pulverize the soil, to mix it with manures and amendments, to cleanse it from weeds, and to cover the seed; 3° the *roller*, to crush the sods of earth and give more consistence to the soil; 4° the *horse-hoe*, composed of socks and coulters, and destined to destroy weeds and give mellowness to the surface of the soil; 5° the *moulding-plough*, composed of two mould-boards or turn-furrows, and destined to mould plants; 6° the *seed-sower*, used in sowing in rows; 7° the *sickle*, *scythe* and *mowing-machine*, to cut grain and mow hay; 8° the *flail* and *threshing-machine*, to separate the grain from the ears of corn.

18. Of what importance are good implements to the agriculturist?

It is important to have good implements for cultivating, because it is the means of performing the work more promptly, more conveniently and in a more perfect manner, and by this means, to draw more profit from the cultivation of the land, provided that these implements be not too expensive, in proportion to the culture to be performed.

19. What are the principal agricultural labors?

The principal agricultural labors are: clearing, conveyance of manure, ploughing, sowing, harrowing, hoeing, weeding, top-dressing, reaping, mowing, getting in, threshing, repairing fences, draining and road-making.

20. Name the months in which each of these agricultural labors should be performed.

Clearing of woodland may be performed in spring, or in autumn and winter, in order to burn the wood in the following summer. Ploughing is performed in spring as soon as the state of the ground can permit; we should above all do as much of it in autumn as we can.

Grain is sown from the middle of April to the beginning of

June; as soon as the seed is deposited in the ground, we harrow and roll it. While certain plants are springing forth, we *hoe* between them to soften and mellow the soil; we *weed* in order to destroy bad herbs; we *mould* to bring back the soil to the base of plants which require this care. Hay-making is done as soon as hay is in blossom. Grain is cut as soon as the foot of the stock becomes yellow, from the middle of August to the end of September; it is threshed in autumn and winter. In October we gather potatoes, beets, carrots, turnips and onions; in November, winter-cabbages. Repairs of fences, ditches and roads should be accomplished in the time that other labors press least; chiefly between seed time and hay-making.

21. Point out the best method of ploughing.

In order that ploughing be good, it is necessary to have the furrows very straight, the furrow-slices properly turned over, of equal thickness and of good breadth; finally, to have it done to a depth proportioned to the nature of the plants that we wish to sow and to that of the soil and subsoil.

22. Point out the advantages resulting from good ploughing.

The principal advantages of good ploughing are: 1° the reversion and pulverizing of the soil, so as to permit heat and moisture to penetrate it, and allow the roots to extend in order to find necessary nourishment; 2° the improvement of the soil by the mixture of manure and pretty often by the augmentation of the *arable* bed (proper for culture); 3° the destruction of weeds.

23. Point out the best manner of cultivating leguminous plants.

For cultivating leguminous plants, are necessary 1° a soil rather light than stiff; 2° several ploughings, one at least deep; 3° sufficient manure; 4° during vegetation, hoeing and several mouldings. It is preferable to sow in rows.

24. Name the most common weeds, and point out the best means to be employed for their destruction.

The most common weeds are: the thistle, the daisy, couch-grass or dog's tooth, plantain, wild succory, sorrel, camomile,

fern, &c. The means of destroying them is to pick such weeds before they bear seed, by repeated ploughings and weedings.

25. Point out the necessity for the cultivation of *herbs*.

Herbs are very useful as seasoners, several even as medecines.

26. What are the herbs generally sown in Canada ?

The herbs most cultivated in Canada are : the parsley, chervil, savory, scallion, &c.

27. Name the principal domestic animals.

The principal domestic animals useful to cultivators, or farm animals, are : the horse, the ox, the cow, the hog and the sheep.

28. What should be the relative numbers of a farmer's live stock ?

The farmer should raise a number of animals proportioned to the extent of his labors, to the food which he can give them, so as to keep them in good condition, and to the quantity of manure that he requires for his culture.

29. What is the object of the improvement of stock ?

One should labor to improve live stock, for the purpose of having animals better adapted to the works for which they are designed, which yield the best and greatest quantity of meat, and, for sheep, more wool ; for cows, more milk.

30. In what case may cross-breeding be advantageous ?

Cross-breeding is advantageous when the reproductive animals are well adapted to the country and climate, and belonging to a breed whereof the maintenance is not too expensive.

31. What precautions is it necessary to take in making good butter ?

The precautions necessarily to be taken in making good butter are : 1° to be very clean ; 2° not to let the cream grow too old ; 3° to squeeze out well all the milk from it ; 4° to salt it suitably.

32. What are the fruits commonly cultivated in Canada ?

The fruit trees commonly cultivated in this country are : the apple, the plum-tree, the pear-tree and cherry-tree ; the shrubs : the gooseberry-bush, the currant-bush and the raspberry-bush.

33. What care is it necessary to bestow on fruit trees in general ?

The care to bestow on fruit trees in general is this : to clean them of dead branches, to prune them (taking off hurtful branches), to graft them (in order to obtain finer and better produce), to clear them of caterpillars, lastly, to place them at a suitable distance.

ANSWERS

TO THE

PROGRAMME

ON

AGRICULTURE

FOR

AN ACADEMY DIPLOMA.

SCHEDULE H. No. 8.

I.

1. Object and utility of lessons in agriculture.

The object of the study of agriculture, is to know the best methods of performing the different labors of a farm, according to the experience of the most able cultivators; and its advantages consist in enabling us to obtain the finest and richest products, with the greatest profit possible.

2. Conditions necessary to successful germination.

To obtain a successful germination, 1° the grain should be well chosen, and new enough; 2° the land should be well suited to it; 3° it should be properly spread and covered; 4° the conditions of air and moisture should be favorable.

3. Names of the different kinds of soil.

There are three principal kinds of soil; 1° the *argillaceous*, formed of argil or clay; 2° the *silicious*, formed of silica; 3° the *calcareous*, composed of *carbonate of lime*. If these substances be mixed, as they are almost always, the name varies, and the land

is called *sandy clay*, *clayey sand*, &c., according as clay, silica &c., abounds in it.

4. Substances of which different soils are composed; define those that impart valuable properties to the soil.

A *compact soil* is that in which *clay* or *argil* prevails; it is cold and tenacious. It is known because it cracks by the drought and the water sejourns on its surface. Its advantages are: that it preserves its freshness better, offers a more solid basis to the roots, and retains longer the fertility which manure has communicated to it. Its disadvantages are: that it retains too much moisture in time of rain, cracks and hardens too much in time of drought. Wheat, oats, beans, beets, as well as clover, thrive well in it.

We call *light soil* that which is composed chiefly of sand or carbonate of lime (matter from which lime can be extracted). The advantages of a sandy soil are: that it dries quicker, that plants spring up and ripen in it sooner, and that it is more easily and cheaply cultivated. Its defects are: to dry up too rapidly, to retain little fertilizing matters, and to expose plants too much to the sudden variations of temperature. Barley, rye, buckwheat, turnips and potatoes thrive well in it.

The advantages of *carbonate of lime* in the soil are: of rendering heavy land more mellow, more friable, and consequently easier to cultivate, and of giving more consistence to a light soil, and by this means also of facilitating its cultivation. Carbonate of lime further augments the quality of certain produce. Barley and sainfoin (French-grass) thrive well in a calcareous soil.

Lastly, the best earth is that which is composed of argil or clay, of silica (sand and pebble-stones) and of carbonate of lime in suitable proportions, with about one twelfth of *humus* (a name given to a dusky or brownish substance produced by the decomposition of animal or vegetable matters).

5. Influences of sub-soil on the quality of land;—sloping land.

The subsoil, that is, the bed which is immediately under the arable soil, being brought more or less to the surface, and mixed with the soil by ploughing deeper and deeper, can influence a great deal, according to its nature, on the quality of land.

The inclination or slope of the land has equally an advantageous or injurious effect in relation 1° to running waters; 2° to the performance of work; 3° to land slips; 4° to exposure, or to that part of the horizon towards which it inclines.

II.

6. Modes of improving the soil.

The most advantageous means of improving the soil are :

1° *clearing*, which consists in putting in a state of cultivation, either a wild lot, or a woodland ;

2° *removal of stones*, which consists in taking out of the land the stones with which it is incumbered ;

3° *surface burning* (l'écobuage), which is done by heaping the surface soil and burning it;

4° *draining* the land, by delivering it from superabundant or stagnant waters;

5° lastly, *amendments*, which consist in the mixture of certain substances with the soil, which (as lime, silicious marl and sand) render it mellow, if it is too compact, or which (as argil, clayey-marl and lime) render it more firm, if it is too friable.

7. Distribution of crops; its principle.

Rotation of crops is the order in which the divers productions of the same field succeed one another: it may consist of three, four....eight or nine years, &c. This succession of produce is highly necessary because, among plants, some serve to mellow the soil, others to cleanse it, some are ameliorating, others exhausting, &c. The effect of rotation should be to render to the soil what has been extracted from it.

Rotation of crops rests on the principle that each kind of plants absorbs particular juice, so that the soil becomes gradually exhausted when the same plants are cultivated in it for a long time.

8. Organic fertilizers; principal fertilizers of this class.

We mean by organic fertilizers those which proceed from the decomposition of animal or vegetable matter. The principal are :

excrements, urines, bones, muck and carcases of animals, vegetable rubbish, sea-weeds, ashes, &c.

The following are the different matters which can specially serve as *manures* (substances destined to enrich the soil): 1° certain plants which we bury before they come to maturity, what we name *green* or *vegetable manures;* 2° linseed-cakes after we have extracted the oil from it; 3° excrements and urines, which are called *animal manures*; 4° *stable dung* or *mixed manures*; 5° ashes; 6° *composts*, formed of lime and clay mixed in beds with rubbish of every kind.

9. Particulars about the relative properties of fertilizers, and methods of application to the soil.

It is necessary to distinguish hot from cold manure, because both do not equally suit all sorts of land. The former (excrements of man, of poultry, of horses and sheep) suits heavy cold land; the latter (excrements of horned cattle) suits light sandy soils.

Liquid manures, such as urine and liquid of the dung-heap, seem to be the most active fertilizers, but their effect is not very durable. Next come solid mineral manures; next stable-dung; finally, green manures. Manures buried fresh are less active, but their action is more durable.

About the application of muck, it is not ordinarily opportune to leave it on the field in small heaps; it is better to spread and bury it immediately. More should be put on the heights than on the low parts of a farm. The quantity to be spread depends on the nature of the soil, the quality of the manure and that of the plants to be cultivated.

10. Fermentation of manures; method of obtaining the best results.

Manures which go through a very active fermentation, lose a great part of their principal fertilizing qualities. It is consequently desirable that manure be submitted to a slow fermentation, and equal in all parts of the heap. It should, therefore, be sprinkled frequently.

11. Mineral fertilizers; kinds of soils which derive benefit from the application of lime; utility of plaster.

We mean by mineral manures, those which proceed neither from animals nor vegetables: such as plaster, lime, marl, &c. Lime, which is used chiefly to improve the soil, can be applied with advantage, either to mellow argillaceous soils, or to give more consistence to silicious land. Liming must be strong or weak according to want.

Baked or crude plaster is used as manure by applying it directly to the soil in artificial meadows, or as a stimulant, by scattering it at random on growing plants. In all cases, it should be well pulverized.

12. Object to be kept in view in the improvement of stock, and the best methods to insure success.

One should labor to improve live stock, for the purpose of having animals better adapted to the works for which they are designed, which yield the best and greatest quality of meat, and, for sheep, more wool, for cows, more milk.

To obtain the amelioration of live stock, it is important to have, in each county, fine reproductive cattle of middle stature, coming from countries similar to our own, and which the raisers can have at their will.

13. Choice of breeding stock;—care which should be bestowed on the sanitary condition of animals.

Cross-breeding is advantageous when the reproductive animals are well adapted to the country and climate, and of a breed whereof the maintenance is not too expensive.

The breeding stock should be moreover healthy, robust and well formed.

Domestic animals should be treated with kindness, receive healthy, abundant and well regulated food, be kept clean, finally, not submitted to excessive or useless work. Their habitation should be sufficiently spacious, high, dry and airy. Urines should be made to gather easily in a reservoir, or in the dung hole.

The number of live stock that should be raised on a farm, depends on the quantity of food that can be given to them, and on that of the manure which we need. In general, it is better to have only such a number as can be conveniently fed. The straw

given to them should be chopped with an instrument called a *chaff-cutter.*

Horses should be kept very clean and not worked but according to their strengh.

It is proper to take away the dung of horned cattle every three or four days, and each day to spread a new litter on the old one.

Sheep should be enclosed in well aired sheep-folds, constructed on dry ground, unpaved and without declivity. It is good to salt their food.

Pigs should be allowed to take air and bathe in water, close by their sty. When many of them take their food together, their trough ought to be arranged in such a way that they cannot quarrel.

III.

14. Care which should be taken in selecting a farm ;—what its size should be.

When purchasing a farm, we should choose one of an extent proportioned to our means, to the number of hands that we can employ and to the kind of culture it requires. A farm of southern exposure should be preferred, which can be easily dried, whose soil is neither poor nor exhausted, neither too moist, too compact, nor too light, and presents not too rapid slopes ; which supplies sufficient water ; not too much cut or eaten by streams ; finally, on which wood enough remains. The distance from the market, from the church and mills, the facility of communications, and the state of the roads should also be taken into consideration.

15. Buildings necessary to a farm ;—their arrangement.

1° the farmer's *residence* should be constructed in a wholesome place, sufficiently distant from the road, protected against the wind, and suitably shaded ;

2° the *barn*, to receive the grain and fodder : it contains 1° the *granary* proper, for the grain ; 2° the *threshing-floor*, where it is threshed ; 3° the *hay-loft* ;

3° the *stable*, for lodging horses ;

4° the *hangar*, where carriages, farming implements and firewood are sheltered;

5° the *cow-house*, destined to receive horned cattle;

6° the *sheep-fold*;

7° the *pig-sty*;

8° the *fowl-house*, for poultry;

9° the *bake-house*, which contains the oven;

10° the *dairy*, in which milk is kept.

These divers buildings should be disposed in such a manner as to enable the farmer to oversee them all at once, that they be in the proximity of the house and of potable water, and that bad smell can injure neither cattle, milk, grain nor hay.

If the farm have much extent, it will be sometimes necessary to multiply the barns, or to replace them by stacks or still better by ricks of sheaves.

16. Principal agricultural implements, and description of their essential parts.

The principal agricultural implements are: 1° the *plough*, which cuts and reverses the land in narrow slices (when the plough has no fore-wheel, it is called a *swing-plough*); 2° the *harrow*, to pulverize the soil, to mix it with manures and amendments, to cleanse it from weeds, and to cover the seed; 3° the *roller*, to crush the lumps of earth and give more consistence to the soil; 4° the *horse-hoe*, composed of shares and coulters, and destined to destroy weeds and give mellowness to the surface of the soil; 5° the *moulding-plough*, composed of two mould-boards or turn-furrows, and destined to mould plants; 6° the *seed-sower*, used in sowing in rows; 7° the *sickle*, *scythe* and *mowing-machine*, to cut grain and mow hay; 8° the *flail* and *threshing-machine*, to separate the grain from the ears of corn.

In the plough there are: the *yoke*, a piece of wood placed on the heads of the oxen to yoke them; the *fore-carriage* composed of wheels and axle (a *swing-plough* has none of them); the *coulter*, a kind of strong knife in advance of the sock, destined to cut the ground vertically; the *sock* or *share*, which cuts and lifts the land horizontally, and contains the *wing*, which is a

plate of metal, and the *socket*, which binds it to the body of the plough; the *sole*, on which it rests and which slides on the bottom of the furrow; the *mould-board*, which overturns the land and reverses it on the next furrow streak; the *beam*, a piece of wood to which the other parts of the plough are attached; the *props*, which bind the sole to the beam; the *regulator*, or *plough-head*, which serves to regulate the breadth and thickness of the excavation; finally, the *handles*, placed at the back of the instrument, by which the ploughman directs it.

The *harrow* is composed of a frame of wood, furnished with teeth; these should be so arranged as to divide well the whole surface of the soil.

17. Drainage; its utility;—best method to be employed.

Drainage is necessary, because an excess of moisture prevents the action of manure, is injurious to the germination of seeds, favors weeds, endangers crops, renders labor difficult and unwholesome, &c. Besides trenches, one makes, for draining a piece of ground, ditches, which receive the superabundant waters and conduct them into some stream. These ditches can be filled with stones, between which the water flows, then covered with other larger stones and a bed of earth: this prevents loss of land, and hinders less the circulation in the fields. It is again preferable to place tiles made of burned clay at the bottom of these covered ditches. This method is called *tile-drainage*.

18. What constitutes good ploughing; size and depth of the furrow, and size of the beds.

In order that ploughing be good, it is necessary to have the furrows very straight, the furrow-slices properly turned over, of equal thickness and of good breadth; finally, to have it done to a depth proportioned to the nature of the plants that we wish to sow and to that of the soil and subsoil.

If the entire surface of a field be ploughed so as to be perfectly even, and not cut with furrows or lines of drainage, tillage is said to be *flat*. It is in *sets*, when there are left, at certain intervals, water furrows parallel to one another. Finally, when the running furrows are nearer to one another, and the sets more or less swelled, the field is said to be ploughed in *ridges*.

19. Best time for ploughing, and the reasons which should induce a farmer to avail himself of it;—object of harrowing.

The most favorable time for ploughing is that when the land is neither entirely dry, nor quite moist: then effectively, it breaks and crumbles naturally in turning over.

The object of harrowing which follows ploughing, is to pulverize lumps uplifted by the plough, and mix more completely the different parts of the soil.

20. Rotation of crops;—the most common system employed.

By *rotation* is meant the succession of crops, according to a determined order, on the different parts of a farm, so that culture follows like a regular circle, which brings back the same crops at the end of the same number of years.

Here is an example of *rotation*.

1st.	year.....	Weeded and mucked plants, or fallow ground.
2nd.	"	Cereals with grass seed.
3rd.	"	Hay.
4th.	"	Hay.
5th.	"	Hay.
6th.	"	Pasturage.
7th.	"	Pasturage.
8th.	"	Pease.
9th.	"	Oats.

21. Fallow land; benefits to be derived from fallow, and the method usually employed.

By *fallow land* is meant a soil in a state of rest or non-production. This rest is necessary when the farmer cannot get the manure required by the soil, or again when he wants to destroy weeds by summer ploughing.

But an enlightened system of rotation supplies the place of fallow ground with advantage.

IV.

22. Care which should be taken in selecting seed, and the benefits to be derived from an occasional change.

The seeds that we intend to sow, should be very ripe and gathered from the most vigorous stems. If they are brilliant and swollen, it indicates that they are healthy and full grown. They ordinarily preserve their power of vegetation only for a certain number of years.

Experience seems to prove that it is advantageous to change seed, and that a plant which is always reproduced in the same soil, becomes degenerated.

23. Names of the plants most generally cultivated in Canada; —advantages of mowing before grasses have attained their full maturity.

The principal farm seeds are: 1° *cereals*, or farinaceous plants: wheat, rye, barley, oats, Indian corn, and buckwheat; 2° *leguminous vegetables:* potatoes, carrots, turnips, beets, (roots); cabbages, pease and beans; 3° *textile* plants: flax, hemp; 4° *forage* plants: millet, trefoil, sainfoin, &c.

In gardens, the radish, onion, leek, garlic, scallion, melon, pumpkin, tobacco, besides several of the preceeding seeds.

It is profitable to gather grain before it is completely ripe, because by this means we avoid shelling it and exposing it too much to immoderate weather, and though seemingly light for the moment, it soon regains the advantage, when it has hardened slowly in the barn.

24. Land most suited for the cultivation of wheat; time of sowing.

Wheat requires a soil more clayey than sandy, having a certain consistence, and abundant in humus. Autumn wheat is sown in the month of August, and that of spring in the beginning of May. It is advantageous to *lime* wheat that we wish to sow, that is, to pass it through lime water.

25. Cultivation of rye and barley;—land best adapted to these crops;—practical culture of barley.

Rye is content with light land, slightly rich; it is harvested two or three weeks before wheat. Its straw serves to cover buildings and to bind sheaves, but gives bad fodder. There are two sorts of rye, Spring rye and that of Autumn.

Barley requires land fresh, mellow and richer than for rye. Calcareous earth suits it well. It should be buried more deeply than wheat, and got in very dry.

26. Cultivation of oats and their use.

The cultivation of oats requires less care than that of the other cereals, and this seed is not difficult for the choice of soil. Nevertheless, its produce becomes twofold by a skilful cultivation. In general, a single ploughing suffices for it. It is important to sow it early.

27. Cultivation of Indian corn, and its use.

Maize or Indian corn prefers a light and moist soil. If we wish to gather the seed, we sow it in rows; if we cultivate it for fodder, we sow it at random. In the first case, we give it two or three dressings and mouldings. It is likewise necessary to take away carefully all the lateral shoots, in order to have the ears of corn larger. We again cut off the top of the stock, after efflorescence, to give it green to cattle. Fodder accruing from maize is excellent.

When we wish to preserve the seed, we gather the Indian corn by breaking the stalks of the blades, when these are ripe, which we recognise by the colour and hardness of the grain. We dry them; afterwards pull off the leaves, and again leave the ears of corn to dry. In the course of winter, we shake out the maize with the hand or some other instrument.

28. Soil best adapted to the culture of pease; mode of culture.

All sorts of land suit the culture of pease, dung is hurtful to them, lime on the contrary is very beneficial. They require deep ploughing. For field-cropping, we do not wait till all be ripe. We can also give them to cattle as green forage, by mowing them before maturity.

29. Cultivation of the potatoes;—soil best adapted.

The potatoe prefers in general light soil; it requires deep ploughing and abundant manure. We may sow the seed, or plant the tubercles; in the latter case it seems more advantageous to choose the smallest, provided that they are ripe, and plant them entire. We plant them with the spade, or with the plough. The potatoe requires harrowing and moulding. It should be gathered when it has come to complete maturity, which is indicated by the dryness of the leaves. Taking out is done by the hand or with the plough. For keeping potatoes during winter, it is necessary to preserve them from frost; from moisture, which would rot them; from heat and light, which would make them bud.

They are a very useful food for cattle; they increase the quantity of milk; baked, they fatten animals a great deal; a little fermented, they fatten them still more.

30. Method of cultivating carrots and turnips;—their use.

The carrot is pleased in land mellow, fresh and light; as it is tap-rooted, it requires very deep ploughing. Turnips prefer compact soils, deep and well prepared. These two plants require to be sufficiently apart, sown in well manured land, harrowed, weeded and hoed. Turnip seed, being very small, should be lightly covered.

These productions raw, or rather cooked, form excellent food for cattle. They are cut with an instrument called a *root-cutter*.

31. Method of sowing and mowing clover; its use.

Clover is sown alone, or rather with a spring cereal; the seed should be very lightly covered. The land should be prepared by good deep ploughing. It is advantageous to spread plaster as a stimulant, on clover, when it is growing. Clover is harvested the year after sowing it. It is mown when blossom is complete. It should not be withered like hay, but only turned up in swaths. Clover reserved for seed is cut when perfectly ripe.

Clover furnishes an abundant and very enticing forage for cattle; it improves the soil by the repose it procures for it, the shade it gives it and the detritus of its leaves and roots; finally, in the rotation of crops, it is usefully placed after wheat and

before oats. It is again a good preparation for a crop of patatoes or of roots.

32. Particulars about the cultivation of hay ; its use.

Hay should be mown when in blossom ; it is stretched on the ground in swaths. Next day, when dew has disappeared, we turn it by upsetting the swaths with a pitchfork : this is continued until it is very dry. The same evening we gather it in little heaps with a rake. When hay is dry enough, it is put in *hay-cocks*, and transferred to the *hay-loft*, or preserved in well made *hay-stacks*. It may be also *bundled*. Air should circulate through hay placed in the barn.

33. Live stock necessary to the farmer, and its care.

It is important for a farmer to raise a sufficient number of cattle, to make them perform the works of the farm, or to sell them. In the first case, he should choose the best breed, wholesome and well shaped ; in the second, great care should be taken to fatten them in a way at once prompt and economical.

The young horse, or foal, should work little before the age of two and a half or three years, and not be trained until four years old. He should be accustomed to work little by little and with kindness, and shoed as late as possible.

Calves should be first suckled ; then give them as much milk as they can take ; afterwards, add eggs to it, and a sort of pap composed of milk and flour ; then crushed radishes, potatoes or carrots as a soup, with water and milk.

34. Description of a model dairy ;—method of making butter.

A good dairy should always preserve an equal temperature, that is, a certain coolness in summer and heat in winter. It should be arched and the floor paved, the vessels put on shelves, and always very clean ; they are washed and scalded in a sort of entry.

To make butter, the milk should be put, after being strained, into vessels broad and shallow, skimmed, and the cream preserved in a separate vessel, until we have enough of it to make butter. We use a *churn* to beat the cream, and we know that the butter is made when it falls in small lumps to the bottom of the churn. We then free it from buttermilk, that is, we throw the butter in

vessels filled with fresh water, and press it by means of flat wooden spoons or beaters, in order to separate it completely from the milk. We salt it carefully, and cover it with brine.

35. Method of making cheese.

To make cheese, the milk is first curdled, commonly by means of rennet. Afterwards, we separate the curd from the whey, until the former become consistent; it is then broken, salted, put in forms or vats, where it is pressed, finally, reversed upon hurdles covered with straw, where it is often wiped and turned over.