

TEXT BOOKS—MUNICIPAL COUNCILS.—We are happy to learn that several Municipal Councils have lately made arrangements to procure and deposit in the clerk's office specimen copies of all the national books, maps, &c., recommended by the Council of Public Instruction for Upper Canada. The following extract from the proceedings of the Municipal Council of the counties of Essex and Lambton, transmitted to the Education Office by S. S. Macdonnell, Esq., the County Clerk, explains the object which the Council has in view :—"Resolved * * * that the sum of £15 be granted to the Circuit Board of Essex, to enable the Board to procure one copy of each of the text-books authorised and recommended by the Council of Public Instruction, and also maps and scientific apparatus adapted for the use of common schools, to remain in the office of the Board of Public Instruction of Essex, as well for the convenience and use of the Board, in conducting examinations of candidates for teachers' certificates, as for specimens open to the inspection of those interested in common schools."

The Municipal Council of the counties of Huron, Perth, and Bruce, have already supplied the County Board with a similar set of books ; and the Municipal Council of the county of Peterboro' have completed the necessary arrangements for establishing a *depôt* for the sale of the national books, maps, &c., at the lowest possible prices. The township of Percy has also ordered a supply of the national books for a similar purpose. These local *depôts*, in connexion with the provincial depository for books, maps, and apparatus, &c.—now about being established—will afford every facility to each school section in Upper Canada for procuring the best and cheapest description of school requisites.

We reflect with much satisfaction upon these gratifying indications of cordial co-operation on the part of the people themselves in the great work of promoting popular education.

THE GOVERNOR GENERAL'S PRIZES IN AGRICULTURAL CHEMISTRY, &c.

We subjoin a few of the answers returned by Mr. R. W. Hermon, the successful candidate for the first of the two prizes in Agricultural Chemistry, &c., which His Excellency the GOVERNOR GENERAL has been pleased to establish in the Normal School for Upper Canada. The answers, as well as the questions themselves, will serve to indicate the extent to which the subject of Agriculture, in its relation to Chemistry, is introduced into the Normal School. It must be borne in mind that the time allowed for answering the whole of the questions—twenty in number—was three hours ; thus affording, on an average, nine minutes for each question. The words printed in italics we have inserted for the purpose of rendering the answers more complete. The whole number of marks fixed upon by the examiners, as equivalent to full and complete answers to all the questions, was 209. Mr. Hermon obtained the highest number—141, and the first prize was therefore adjudged to him.

Question 1. State the composition of the Atmosphere and some of its most important properties.

Answer. The most important substances contained in the atmosphere are, nitrogen, oxygen, carbonic acid, vapour of water, and a small quantity of ammonia.

The exact quantities in 100 parts, are,

Nitrogen,	79	} 100
Oxygen,	20	
Carbonic Acid,	$\frac{1}{1000}$	
Water, a small variable quantity.		
Ammonia, a trace.		

Its most important mechanical properties consist in the diffusion of its gases, its elasticity, *weight*, and power of suspending vapour of water.

Its chemical properties it owes to some of the gases of which it is composed, namely, CO² (carbonic acid,) and O, (oxygen) ; the former is the most active agent in the decomposition of rocks and the inorganic portion of the soil ; the latter is chiefly instrumental in converting the organic portion of the soil into carbonic acid and water, which constitute the most important parts of the organic food of plants.

Ques. 2. Describe good natural surface or agricultural soil, and the mode in which it originates.

Ans. A good natural surface soil should contain siliceous sand, silica, alumina, peroxide and protoxide of iron, carbonate of lime and magnesia, silicate of potash and soda, phosphate and sulphate of lime, decaying vegetable matter, (humus) ; and a small quantity of nitrogenous organic matter. Chloride of sodium (common salt) is also generally present in good arable soils. These substances are variously compounded. They originate from the decomposition of rocks.

All granite rocks are composed of silica, in combination with peroxide and protoxide of iron, potash, soda, lime, magnesia, and alumina ; all of which, with the exception of iron and alumina, combine readily with the CO² (carbonic acid) of the atmosphere, forming soluble carbonates of those bases. These are gradually washed out by rains, dews, &c., and conveyed away to the vallies, being there deposited in the form of beds, with clay or sand, as the case may be. Now, water entering the pores thus left in the rocks, freezes during the winter season, expands, and gradually disintegrates the rock, forming a siliceous sand, which, owing to the increased surface thus exposed, is soon further decomposed by the various chemical agents *existing in the atmosphere*. A soil is thus gradually formed from the solid rocks ; and when vegetable matter has slowly accumulated in it, it constitutes common arable land,

Ques. 4. (1.) On what rock does the subsoil repose in Canada West ? (2.) State the geological periods to which those rocks belong, (3) and furnish a list of other fossiliferous strata, of more recent date, in the order of their deposition.

Ans. (1st.) Upon the Lower Silurian, and in some parts of the province upon the Upper Silurian.

(2nd.) They belong to the primary fossiliferous strata.

(3rd.) The fossiliferous strata lying above the silurian, arranged in descending order, are,

1. Post pliocene	} (drift and boulder, &c.)
2. Newer pliocene	
3. Older do.	
4. Miocene	} Tertiary group.
5. Eocene	
6. Chalk	} Secondary group.
7. Green sand	
8. Wealden clay	
9. Upper oolite	
10. Middle do.	
11. Lower do.	
12. Lias	
13. Newer red sand-stone	
14. Older new red do.	
15. Coal measures	
16. Old red sand-stone	

Ques. 6. Describe the general structure of a plant, also the functions of its roots and leaves.

Ans. Plants consist of roots, stem, branches, and leaves. The functions of the roots are,

1st. To sustain the plant in an upright position.

2nd. To abstract from the soil the various kinds of food, both organic and inorganic, from which the plant builds up its structure.

The leaves act as a stomach, a mouth, and lungs. Their office as a stomach is, to decompose or digest the food which is conveyed to them by means of the *roots and stem from the soil*, or taken in by their stomata from the atmosphere. As mouths, they absorb the gases of the atmosphere, such as CO² and vapour of water ; some plants (as clover) obtain nitrogen also directly from the air. As lungs, the leaves give off oxygen during the day, and carbonic acid during the night. The carbon of the absorbed carbonic acid, uniting with the elements of water, forms dissolved woody fibre, (C¹² H⁸ O⁸) &c., which, being conveyed down the stem, (*inner bark*), is gradually deposited in the solid form.

Ques. 7. Of what substances does the organic food of plants consist, and in what forms does it exist in the atmosphere and soil ?

Ans. Of carbonic acid, water, ammonia, NO³ (nitric acid) and nitrogen in the pure state.