carbon and oxygen, and that it contains (very nearly) its own volume of oxygen?

3. Describe how you would prove boneash to consist chiefly of calcium phosphate. Explain the decomposition of bone-ash by diluted sulphuric acid. Explain by means of symbols the reaction which takes place when a solution of sodium carbonate is added to one of phosphoric acid.

4. Describe the leading properties of arsenic, and name those elements that are usually grouped with it. What means do we possess for the detection of small quantities of arsenic? Name the substance which is considered the best antidote against it. State how you would determine whether a given gas consists of arseniuretted or antimoniuretted hydrogen.

5. Describe the preparation of potassium from potassium carbonate, and explain the process. State how you would distinguish potassium from sodium, and how detect each metal in its compound.

6. By what experiments would you prove that gunpowder is a mixture and not a compound. Explain fully how the substances of which it is composed act on each other during combustion. How do you explain the mechanical effects produced by the explosion of gunpowder?

7. How is metallic lead obtained from galena? A sample of water is supposed to contain a small quantity of a lead compound : describe fully how you would esamine the water for lead.

8. How would you prepare pure silver from an alloy of silver and copper? Why is silver considered a monovalent metal? Enumerate the oxides of silver and give a brief description of each of them. The ordinary silver coins are made of an alloy of silver and copper : how would you prove the presence of both these metals in a coin?

9. State the composition per cent. of iron pyrites, epsom salts, calomel, and corrosive sublimate.

ro. What weight of marble, when acted on by hydrochloric acid, will yield a cubic foot of carbonic acid gas?

BOTANY AND AGRICULTURE.

Time-Two Hours.

I. Explain the origin of the different tial Points, kinds of placentas; and of the different Perihelion.

parts of the fruit of the plum, the oak, and the maple.

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2. Describe fully the process by which it is supposed that water is carried up from the roots of plants.

3. Give the meaning of the terms stomata, indehiscent, thyme, glume, and pyxis. Distinguish epiphytes from parasites.

4. Describe any plant which you have examined ; if you can, tabulate your description.

5. Name all the families of monopetalous dicotyledons which you remember, and give the characters of any one of them.

6. Illustrate the connection between the arrangement of leaves on the stem, and the position of the various parts of the flower.

7. What are the most important mineral constituents of wheat, of wheat straw, of the tubers of the potato, and of clover?

8. Explain the value of gypsum as a manure.

9. Write notes on the proper methods of cultivating Indian Corn, Peas and Turnips. 10. Compare the chemical composition of wheat and beef.

GEOGRAPHY.

Time-Two Hours.

1. Discuss the origin and development of prairies.

2. What is the ratio of increase in the temperature of the earth in descending from the surface towards the centre ? What thermal phenomena arise therefrom, and why is the surface temperature affected so little by the internal heat ?

3. Account for the formation of stratified and unstratified rocks, and classify the latter in chronological order.

4. What points of similarity are noticeable in the vertical relief of all the continents?

5. Give examples of remote and recent changes in the configuration of the earth's surface.

6. If a person go around the world westward to the place whence he set out, how much time will he gain or lose? Explain.

7. Define the following :-- Declination, Cardinal Points in the Heavens, Equinoctial Points, Nodes, Disc, Apogee, Transit, Perihelion.