10. Power and freedom of God; definition and proof.
11. Providence of God; definition and proof.
12. Evil; moral evil, physical evil.

IV.

Morals.

1. Motives which prompt our actions.
2. Fundamental principles of morals.
3. Difference between moral good and evil.
4. Moral obligations.
5. Laws.
6. Rewards and penalties.
7. Moral sanction.
8. Destiny of man.
9. Proofs of the immortality of the soul.
10. Necessity of religion.
11. Necessity of internal, external and public worship
12. Religion the basis of society.
13. Important duties which man owes to himself.
14. Active and passive duties to society.
15. Right of property and civil rights.
16. Origin of political organization.
17. Divers forms of political authority.
18. Principles of sovereign power.
19. Duty to the State.

PROGRAMME N° 2.

NATURAL PHILOSOPHY.

I.

1. Object of Natural Philosophy; its relation to chemistry.
2. General properties of matter; definitions.
3. Weight; its direction; laws affecting falling bodies.
4. The balance and its principle; description; conditions necessary to its efficiency.
5. Principle of Archimedes; equilibrium of bodies, immersed and floating on the surface.
6. Principles which cause liquids to rise to their levels; description; Artesian wells.

II.

7. Density; different modes of increasing it.
8. Description of areometer and its use.
9. Capillary attraction; endosmose; ascent of the sap in trees.

III.

10. Experiments illustrating atmospheric pressure; cause.
11. Principle and description of pneumatic engine.
12. Principle and use of the barometer; conditions necessary to insure its efficiency.
13. Weight of atmospheric pressure in pounds.
14. Law of Mariotte; description and manner of using the manometer.
15. Principle of the balloon; how to produce an ascentional force.
16. Principle of the syphon and the pump.
17. Description of the principal kinds of pumps.

IV.

18. Sound; its production and the manner in which it is communicated.
19. Laws of the variation of the intensity of sound; principle of the reflection of sound; echo and vibration.

V.

20. Principle and use of the thermometer; manner of construction and liquids employed.
21. Conditions necessary to ensure good qualities; scale of the principal kinds of thermometers.
22. Manner of comparing the degrees of the scales of the Fahrenheit, Reaumur and Centigrade.
23. Unequal expansion of different liquids; maximum density of water.
24. Conductors; name the principal conductors in their order.
25. Point out the most advantageous means of securing warmth within habitations, according to the laws which influence conductors of heat;—utility of double-windows.

VI.

26. Radiation of heat; examples.
27. Intensity of radiation;—capacity for heat;—name the bodies possessing the greatest power of radiating heat.
28. Reflection of heat;—its relation to radiation.
29. Application of the principles of radiation and reflection to heating and preservation of heat.
30. Fusion;—refractory bodies;—law of fusion.
31. Congelation;—law of congelation.
32. Account for the equality of temperature maintained during the fusion and solidification of bodies.
33. Expansion of water during the process of solidification;—cause of the floating of ice in water.

VII.

34. Ebullition and vaporization;—causes which increase vaporization.
35. Phenomena of vaporization;—cold produced by vaporization.
36. Freezing mixtures; their use; preparation and parts composing some of these mixtures.
37. Elastic force of vapor; influence of temperature on this force.

VIII.

38. Principle of the steam engine, and description of boilers for generating steam.
39. Principal parts of the steam engine and their functions.
40. Single and double acting steam engines;—condensing engine;—high and low pressure principles;—expansion engine.
41. Peculiar noise heard before ebullition takes place;—nature of ebullution;—tension of vapor.
42. Influence of pressure on ebullition,—influence of matter held in solution;—distillation of liquids.
43. Principal sources of heat;—means generally employed to produce artificial heat.
44. Necessary conditions to obtain a good draught in constructing the flue of a chimney.
45. Different modes of heating buildings, and their relative advantages.

IX.

46. Light;—shade;—penumbra.
47. Reflection of light and the laws which govern it.
48. Refraction;—its laws:—phenomena caused by refraction.
49. Cause of the *mirage*.

X.

50. Lenses;—different kinds of lenses;—properties of the lenses more commonly used.
51. White light;—names of colors of the spectrum and the order in which they occur.
52. Cause of color in bodies.
53. Microscope;—principle of the compound microscope.
54. Principle of the astronomical telescope;—terrestial telescopes.
55. Myopy;—presbyopy;—glasses used to correct these defects.