

SCIENCE—*Continued.*

Gravity and Atomic Volume. Chemical and Physical Properties which vary with Atomic Mass and Atomic Volume. Specific Heat and Atomic Heat. The Natural Classification. Some common elements as representatives of Families. The Periodic Law of Color, of Valency, of Electric Property, of Volatility, Solubility and Reducibility, and of Toxic Power. Isomorphism and variation of Chemical Properties with change of Valency. Description of Natural Families and Groups, with special mention of most useful compounds and characteristic reactions. Principles of Analysis.

The Gas Laws. Avogadro, Boyle, Gay Lussac, and Charles. Molecular Masses. Solution of Gases, Liquids and Solids. Kinetic Theory of Gases, Liquids and Solids. Conditions of Equilibrium. Vapor, Osmotic, and Solution Pressures. Molecular Variations of Boiling and Freezing Points. Dissociation, Ionization and Electrolysis.

Organic Chemistry—The Carbon Valency and the Carbon Radicals. The Paraffins and their derivatives—Ethers, Aldehydes, Alcohols, Fatty Acids and Soaps. The Phenols, Fruit Acids and Sugars. Fermentation, Diastase, Digestion. The Aromatic Series.

*Books of Reference:* Newth's Chemistry, Watt's Dictionary of Chemistry, Ramsay's System of Inorganic Chemistry, Remsen's Organic Chemistry and his Inorganic Chemistry, Ostwald's Outlines of General Chemistry, Dobbin and Walker's Chemical Theory for Beginners, and Shepard's, Williams's or Eliot and Storer's Text-books.

Two hours are spent each week in the lecture room and one in the laboratory, where strictly research methods are followed. Dry and wet methods are correlated, beginning with the heavy metals. The object of the course is to give a general view of Chemistry and to lay a broad basis for any future advanced research or technical work in which the student may engage.

**Junior Year (Elective.)**

BIOLOGY—Lectures on General Biology. The Properties of Protoplasmic Matter. Plant and Animal Life. Botanical