THE CHEMISTRY OF LIFE—A wonderful part of the phenomena of Organic Chemistry is the diversity of properties produced, even by slight changes in elementary composition and proportions. We have already noted this in certain instances; but the proofs, most singular and impressive, are those connected with the influence of organic agents on animal life. An atom added to, or abstracted from, a compound, determines whether the product be wholesome or noxious—an aliment or a poison. So closely is the Chemistry of the material world around us associated with that still more refined and mysterious Chemistry which ministers to the phenomena of life! Every solid tissue, every fluid of the body, has its appropriate chemical composition and relations. Every organic function depends upon, or involves, chemical changes in its progress. The air we breathe is no sooner within the lungs than these changes begin; analogous to combustion in their nature, and effecting that transformation from venous to arterial blood, which is essential to life in its every part. The food we take hardly enters the stomach before it becomes the subject of chemical actions, which are continued and multiplied, till its final assimilation and admission into the mass of circulating fluids. All the secretions and excretions from the blood, many of them singularly complex in their nature, depend on like agency; subordinate, however, as is all besides in the animal frame, to that vital principle, which we everywhere see in its effects, though unable to separate or define it. Morbid changes and growths may frequently be referred to the same actions, abnormal in kind; and we have cause to believe that, under deficient vitality, either from disease or old age, these purely physical processes do often so usurp upon the fabric and functions of life, as to become the causes of death. Equally is it to be presumed, from recent researches of physiology and pathology, that certain diseases have their origin in chemical changes of the blood; either generating morbid agents within itself, or multiplying by an action analogous to fermentation, poisons and morbid matters received into the body. This wonderful fluid, ever in motion and change, and subject at once to chemical laws and to the principle of life, is in itself a mine of future discovery; not to be worked otherwise than by consummate skill and perseverance, but promising results which, as respects both science and human welfare, may well reward the highest efforts of research.—*Quarterly Review.*

GEOLOGY.—The surface of the earth is 196,862,256 square miles; and its solidity is 259,726,736,516 cubic miles.

The sea is to the land, in round millions of square miles, as 160 to 40, or as four to one.

The earth is, according to different measurements, 7912, 7916, and 7924 miles in diameter; and about 24,860 or 24,880 miles round.

Those of the ancients who did not believe in the sphericity of the earth, thought it a cylinder, or an extended plane. Homer made it circular, and the outside water, and this was the idea of the Jews. The later Greeks from Pythagoras and Thales taught the sphericity. But the popes believed it a plane, giving all to the west to the kings of Spain.

The surface of the sea is estimated at 150 millions of square miles, taking the whole surface of the globe at 197 millions, and its greatest depth is supposed to be equal to that of the highest mountains, or four miles; but La Place thinks that the tides demand an average depth of three miles, therefore, the sea would contain 450 millions of cubic miles.

The remains of animals and vegetables in the rocks and earthy strata of the earth, are the true and only means of ascertaining its history and natural changes before the records of man. The discoveries made on this subject within the last half century, form an era in science in which the name of Cuvier will always be distinguished. In all countries, on digging to certain depths, and in mining, the remains of fishes, vegetables, quadrupeds, and birds, are found in the soil or embedded in the rocks, except in those of primitive antiquity. The general regularity with which those that are marine are laid at one level, and those which are products of land are laid at another, and the alternations of these marine and land products, lead to the conclusion that the sea has repeatedly covered the land for long periods of time, and that the land has, at intermediate periods, been dry; and what is very remarkable, the remains found consist, and always at certain depths, of species of animals, vegetables, &c., not now in existence, and often, of genera not natural to the present climate. Cuvier has enumerated several hundred genera of animals, fishes, and vegetables so found, of which there are none of the living genera or species. The lowest rocks, it is therefore inferred, were at one time the surface of the earth, and the seat of organic life. These appear to have been destroyed by some great revolutions which brought new tribes of organized beings, while their kinds prove that the surface was covered with water. The subsequent appearance of amphibia, &c., prove the development of dry land; these appear to have been swept away, and among later solid rocks, the monstrous race of herbivorous quadrupeds and gigantic lacerta came into existence when the earth seems to have acquired herbage for their subsistence. How long this race kept possession cannot be guessed, but their length of life is well known. The gypsum, &c., which now contains their remains is covered with newer deposits, abounding in sea shells, and above that stratum is found a new race of herbivorous animals of the genera of the elephant, rhinoceros, &c., and above them is the first loose soil, intermixed with marine substances, proving second or third immersions of the sea; and above this lies the soil which the present race of animals enjoy. What may yet follow, and when, and how, is a curious question.

In the newest solid rock formations, whales, seals, and birds appear; above these land animals of enormous size, birds, and fresh water shells, all in concrete rocks.

COVERING METALS WITH BRASS OR BRONZE.—For Brass, employ a solution in water compound of 500 parts of carbonate of potash, 20 parts chloride of copper, 40 parts sulphate of zinc, and 250 parts nitrate of ammonia; and after scouring the article to be coated, properly, it is put in commotion at the ordinary temperature with the negative pole of *Bunsen* battery, the positive decomposing pole a plate of brass.

For Bronze. Make use of the same preparation and perform in the same manner, as for brass, with the exception of substituting a salt of tin for the sulphate of zinc, and apply bronze to the positive pole instead of brass.

By means of these solutions, wrought or cast iron, steel, lead, zinc, tin, and the alloys of these metals, either with each other or with bismuth and antimony, may, with facility, be coated with brass or bronze, and after having undergone the usual coloring process they equal in beauty the finest bronzes.

When very large surfaces are to be coated, the number of pairs of plates to the battery should be increased. By this method, rough cast iron may be made to assume a very beautiful appearance, and will remain unoxydized when not exposed to the weather. For *outside work* articles should be protected by a coating of suitable varnish.—*N. Y. Farmer.*