

might occur in rocks now coarsely crystalline. As time went on, true sediments would predominate over extravasated materials, and these would be less and less affected by chemical changes, and would more and more retain their original character. Thus we should expect that as we retraced the earth's course through "the corridor of time," we should arrive at rocks which, though crystalline in structure, were evidently in great part sedimentary in origin, and should beyond them find rocks of more coarsely-crystalline texture and more dubious character, which, however, probably were in part of a like origin; and should at last reach coarsely-crystalline rocks, in which, while occasional sediments would be possible, the majority were originally igneous, though modified at a very early period of their history. This corresponds with what we find in Nature, when we apply, cautiously and tentatively, the principles of interpretation which guide us in stratigraphical geology.

I have stated as briefly as possible what I believe to be facts. I have endeavoured to treat these in accordance with the principles of inductive reasoning. I have deliberately abstained from invoking the aid of "deluges of water, floods of fire, boiling oceans, caustic rains, or acid-laden atmospheres," not because I hold it impossible that these can have occurred, but because I think this epoch in the earth's history so remote and so unlike those which followed, that it is wiser to pass it by for the present. But unless we deny that any rocks formed anterior to or coeval with the first beginning of life on the globe can be preserved to the present time, or, at least, be capable of identification (an assumption which seems to me gratuitous and unphilosophical) then I do not see how we can avoid the conclusion to which we are led by a study of the foundation-stones of the earth's crust—namely, that these were formed under conditions and modified by environments which, during later geological epochs, must have been of very exceptional occurrence. If, then, this conclusion accords with the results at which students of chemistry and students of physics have independently arrived, I do not think that we are justified in refusing to accept them, because they lack the attractive brilliancy of this or that hypothesis, or do not accord with the words in which a principle, sound in its essence, has been formulated. It is true in science, as in a yet more sacred thing, that "the letter killeth, the spirit giveth life."

SYSTEMATIC RELATIONS OF *PLATYPSYLLUS* AS DETERMINED BY THE LARVA.

PROF. C. V. RILEY, in a paper read at a recent meeting of the National Academy of Science (U.S.A.), drew attention to the unique character of *Platypsillus castoris*, a parasite of the beaver; and gave an epitome of the literature on the subject, showing how the insect had puzzled systematists, and had been placed by high authority among the Coleoptera and the Mallophaga, and made the type even of a new order. He showed the value, as at once settling the question of its true position, of a knowledge of the adolescent states. He had had since November 1886 some 14 specimens of the larva, obtained from a beaver near West Point, Nebraska, and had recently been led to study his material at the instance of Dr. Geo. H. Horn, of Philadelphia, who at a recent meeting of the Entomological Society of Washington announced the discovery of the larva by one of his correspondents the present spring, and will publish a full description of it. Prof. Riley indicated the undoubted Coleopterological characteristics of the insect in the imago state, laying stress on the large scutellum and five-jointed tarsi, which at once remove it from the Mallophaga, none of which possess these characters. He also showed that the larva fully corroborates its Coleopterological position, and that its general structure, and particularly the trophi, anal cerci, and pseudopod, confirm its Clavicorn affinities. He showed that the atrophied mandibles in the imago really existed as described by Le Conte, and that even in the larva they were feeble and of doubtful service in mastication. He mentioned, as confirmatory of these conclusions, the finding by one of his agents, Mr. A. Koebele, of *Leptinillus* (the Coleopterological nature of which no one has doubted, and the nearest ally to *Platypsillus*), associated with *Platypsillus* upon beaver-skins from Alaska; also the parasitism of *Leptinus* upon mice. He paid a high compliment to the judgment and deep knowledge of the late Dr. Le Conte, whose work on the imago deserves the highest praise, and whose conclusions were thus vindicated. "*Platypsillus* therefore," he concluded, "is a good Coleopteron, and

in all the characters in which it so strongly approaches the Mallophaga it offers merely an illustration of modification due to food, habit, and environment. In this particular it is, however, of very great interest as one of the most striking illustrations we have of variation in similar lines through the influence of purely external or dynamical conditions, and where genetic connection and heredity play no part whatever. It is at the same time interesting because of its synthetic characteristics, being evidently an ancient type, from which we get a very good idea of the connection in the past of some of the present well-defined orders of insects."

SCIENTIFIC SERIALS.

Atti della R. Accademia dei Lincei, July and August 1888.—In both of these numbers G. Vicentini and D. Omodei continue their important inquiries on the thermic expansion of certain binary alloys in the liquid state. So far they have arrived at the following general conclusions: (1) the variation of volume accompanying liquid metallic mixtures is extremely slight; (2) no relation can be established between the variations of volume that accompany the formation of alloys in the solid and liquid states; (3) the variation of density at the moment of solidification is in general less than would be the case were the constituent metals to preserve in the alloys the value that they possess in the isolated state; (4) the binary alloys of lead and tin, of tin and bismuth, and of tin and cadmium, possess in the state of perfect fusion an expansion equal to that resulting from the sum of the expansions of the associated metals; (5) the alloy of Bi₂Pb possesses a coefficient of expansion far greater than the sum of the expansions of the constituent metals. These experiments, which conclude for the present with a preliminary study of the antimony and zinc alloys, have been carried out at the physical laboratory of the University of Cagliari, Sardinia.

Rivista Scientifico-Industriale, October.—Experiments made with Crookes's radiometer, by Prof. Pietro Lancetta. The experiments here described have been undertaken chiefly for the purpose of making a synthesis of certain phenomena which are more easily produced by this apparatus than by any other means. It is also shown that the radiometer may in some cases be more advantageously employed than the ordinary thermometer, especially in testing certain laws regarding latent and luminous heat, Crookes's instrument being sensible both to the dark and luminous wave of the solar rays. The results of the experiments show generally that in a homogeneous medium the radiation of the thermo-luminous wave is propagated in a straight line; that the luminous wave is propagated *in vacuo*; that the intensity of the thermo-luminous wave is in inverse ratio to the square of the distance; that the evaporation of fluids as well as the rarefaction of gaseous bodies is accompanied by a lowering of the temperature, while the condensation of gas develops heat.

Journal of the Russian Chemical and Physical Society, vol. xx, fasc. 6.—On the speed and the products of decomposition of the chlorate and chlorite of lithium, by A. Potiltzin, being the second part of an inquiry into the properties of gaseous compounds. The decomposition of the two above-mentioned salts, as well as of the bromate of barium, is best explained according to the law of unstable equilibrium indicated by the author in his former works, and which he sums up as follows: in each chemical reaction the equilibrium of the system depends upon the values of their atomic weights, their masses, and their stock of potential energy.—On the relation between the rotatory power and the refraction of organic compounds, by J. Kanonnikoff, first part.—On the action of organic iodides on sodium-nitro-ethane, by N. Sokoloff.—Obituary notice of Prof. Wroblewski, by S. Lamansky.—The total eclipse of the sun of August 19, 1887, by N. Egoroff; and on the results of meteorological observations during the same eclipse, by N. Hesehus.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 31.—"On the Effect of Occluded Gases on the Thermo-electric Properties of Bodies, and on their Resistances; also on the Thermo-electric and other Properties of Graphite and Carbon." By James Monckman, D.Sc. Communicated by Prof. J. J. Thomson, F.R.S.