

of this single stem is not to be assigned to either chance or to chemico-physical, but to an "Entwickelungs-gesetz" yet to be discovered. This, we confess, is to us a disappointing termination to a clever and spirited essay. Surely Dr. Dohrn would not expect a scientific man to understand by the word "chance" anything but a periphrasis for the operation of hidden cause. And what can he expect any law of development to be, if not an expression of the operation of chemico-physical causes?

As to the original form under which life made its first appearance, Dr. Dohrn's words would almost lead to the impression that he believes in the creation of a "type-form" something like the Cherubim, with an account of which Archdeacon Freeman favoured Section D of the British Association when it met at Exeter in 1869. His language is, however, sufficiently vague to warrant the supposition that, as an orthodox physical philosopher, he holds the doctrine of the evolution of organic forms subject to the larger doctrine of general evolution, and consequently we may suppose that he would hold that the single stem which has blossomed in man, and from which all other forms have descended by retrograde development, *did* take its origin from simple protoplasm, which had naturally been evolved from carbon compounds. If the animal pedigree did originate from these very simple beginnings, we suppose Dr. Dohrn would say that all trace of them is gone, what is simple *now* in the way of organisms is not the simplicity of the original stock, but a simplicity attained by degeneration. We do not see any reason to accept this hypothesis of *universal* degradation (man alone being excepted from its influence), any more than we can see reason to accept the competing hypothesis of *universal* progress. We are very strongly inclined to think that neither hypothesis can have the whole field to itself. We should expect to find in some directions progress, in others retrogression.

The extent to which each of these processes has gone on in past ages in connection with the family history of the animal kingdom is the great problem for zoological research.  
E. R. L.

#### THE NEW METAL GALLIUM

THE discovery, by M. Lecoq de Boisbaudran, of a supposed new element in a blende from the Pierrefite mine in the Argeles Valley, Pyrenees, was made known in our "Notes" of last week. This element, which the discoverer proposes to name *Gallium*, has revealed itself by the following chemical reactions:—

The oxide, or possibly suboxide, is precipitated by metallic zinc from a solution containing chlorides and sulphates.

In a mixture of the chlorides of the new metal and of zinc, ammonia throws down the new element first if added in a quantity insufficient to precipitate the whole of the metals present. Nearly the whole of the gallium is thus thrown down in the first fraction.

Under conditions competent to peroxidise the new metal, the oxide is soluble in excess of ammonia.

Ammonium sulphhydrate produces a precipitate insoluble in an excess of the reagent. The sulphide appears to be white.

Sulphuretted hydrogen produces a precipitate in presence of ammonium acetate and excess of acetic acid. In presence of zinc salts the new substance concentrates itself in the sulphides first deposited, but six fractional precipitations were requisite to remove the greatest part of the zinc sulphide. In presence of hydrochloric acid no precipitate is formed.

The oxide, like that of zinc, dissolves in excess of ammonium carbonate.

The salts of gallium are readily precipitated in the cold by barium carbonate.

The chloride may be frequently evaporated with great

excess of *aqua regia* without undergoing any loss by volatilisation.

When hydrated zinc chloride containing a trace of the new substance is heated to the point when zinc oxychloride begins to form, the gallium remains in an insoluble condition, possibly as oxychloride.

The quantity of the substance procured was too small to attempt its isolation. Some drops of zinc chloride solution in which the new metal had been concentrated were examined spectroscopically by the electric spark. The spectrum is composed chiefly of a violet line about wavelength 417, and a feeble line about 404.

In his communication to the French Academy, the author states that he obtained the first indications of the new metal on Friday, Aug. 27. It is to be hoped that a good supply of the mineral will be procurable, so that the new element may be isolated, its atomic weight determined, and its reactions studied in detail. This now makes the fifth terrestrial element which the spectroscope has been instrumental in bringing to light.

R. MELDOLA

#### UNPUBLISHED LETTERS OF GILBERT WHITE

AT the meeting of the Norfolk and Norwich Naturalists' Society, held on the 28th inst., the secretary read an interesting series of ten unpublished letters, written by Gilbert White, of Selborne, to Robert Marsham, F.R.S., of Stratton Strawless, Norfolk, and communicated by the Rev. H. P. Marsham, great-grandson of the latter. The letters, which are dated between August 13, 1790, and June 15, 1793, are excellent examples of Gilbert White's delightfully discursive style, their contents being of a very varied nature. Mr. Marsham, to whom they were addressed, was a great planter, and communicated his experiments on growing trees to the Royal Society; the beauty and great size of the timber at Stratton bear testimony at the present day to his judgment and successful treatment. As might be expected, under these circumstances, a large portion of the correspondence is devoted to forest-trees, the love for which was shared in an almost equal degree by both correspondents. The "Indications of Spring," of which Mr. Marsham left such a remarkable register, and which have been continued by his family, with one slight interruption, from the year 1736 to the present time (see "Philosophical Transactions" for 1789, and the "Transactions" of this Society for 1874-5), of course form an annual topic, as well as the rainfall; but perhaps the most valuable part of the correspondence is the gossip about birds, some of which is of very great interest. On the 30th October, 1792, Marsham writes to White: "My man has just shot me a bird which was flying about my house; I am confident I have never seen its likeness before." On reference to his Willoughby, he declares it to be "the Wall-creeper, or Spider-catcher," and a description, endorsed by him on one of White's letters, as well as a manuscript note in his copy of Willoughby's "Ornithology," still in the possession of the Marsham family, places it beyond doubt that the bird was a veritable *Tichodroma muraria*. White, after saying he is persuaded that the bird is the "very *Certhia muraria*," continues: "You will have the satisfaction of introducing a new bird of which future ornithologists will say, 'Found at Stratton, in Norfolk, by that painful and accurate naturalist, Robert Marsham, Esq.,"—a prophesy which, after an interval of eighty-two years, will at length be fulfilled. Nearly a whole letter is devoted to an extract from an unpublished "Natural History of Gibraltar," by Gilbert White's brother, the Rev. John White, who resided many years on the "Rock." By this it is shown that John White, who went to reside there in 1756, soon discovered the Crag Swallow