contain an invertebrate fauna identical with that of the Laramie group.

With regard to vertebrate remains, this objection does not apply; and, could they be made to harmonize with themselves, they might, perhaps, be trusted to some extent as indices of synchronism in widely separated localities. But, as shown by Cope, they do not thus agree, for the Laramie forms include genera that are regarded as characteristic of Cretaceous, and others that are regarded as characteristic of Tertiary strata. This should surprise no one. The law that has been laid down by paleontologists, that the same epochs in geologic time produced the same living forms, is contrary to the now well-established principles of geographical distribution, according to which the earth is subdivided into a large number of faunal areas more or less clearly marked off one from another.

The peculiarity of this principle, which is of most importance to paleontology, is that these territorial subdivisions represent faunas not merely different from one another, but showing different degrees of biologic development as development is supposed to have gone on in the animal kingdom. Every one knows that the fauna of Australia belongs to an undeveloped type, being marsupial in aspect so far as its mammals are concerned. The types of South America are lower than those of North America, and the latter lower than those of Asia and Europe. If all the present faunas of the globe were buried under its soil, it is clear that it would not only be impossible to harmonize the deposits of different continents, but that the inference now freely drawn by paleontologists, that the less developed forms demonstrate their existence at earlier epochs, would lead to grave mistakes and be generally false. New Zealand is now in its age of birds, while the Galapagos Islands are still in that of reptiles, or the mesozoic age.

The difficulties in the way of geological synchronism arising from the geographical distribution of organisms are not lessened when we pass from the vertebrate fauna to the flora of the Laramie group; for, taking the present flora of the globe as a criterion, we find that the geographical distribution of plants is more uneven than that of animals. Floral realms are more numerous and distinct than faunal realms; and the more serious obstacle, that some areas furnish types representing less developed floras than others, exists here, as in the case of animals. The proteaceous and myrtaceous flora of Australia may be regarded as rudely corresponding to its marsupial fauna. Hence, although the vegetable fossils of the Laramie group are especially remarkable for their great abundance and variety, Mr. Ward concedes that the age of the Laramie group cannot be proved by its flora alone.

The more particular comparison and discussion of the Upper Cretaceous or Senonian, Laramie, and Eocene floras is introduced by a table covering 72 pages, and giving the geographical and stratigraphical distribution of every authentic species from these formations. The discussion concludes with the statement that the Laramie flora as closely resembles the Senonian flora as it does either the Eocene or the Miocene flora. But this does not necessarily prove either the Cretaceous age of the Laramie group or its simultaneous deposit with any of the Upper Cretaceous beds. The laws of variation and geographical distribution forbid us to make any such sweeping deductions. With regard to the first point, it is wholly immaterial whether we call the Laramie Cretaceous or Tertiary, so long as we correctly understand its relations to the beds below and above it. We know that the strata immediately beneath are recognized Upper Cretaceous, and we equally know that the strata above are recognized Lower Tertiary. Whether this great intermediate deposit be known as Cretaceous or Tertiary is therefore merely a question of a name, and its decision one way or another cannot advance our knowledge in the least.

The synopsis concludes with notes on the various localities where the Laramie plants were collected, and 35 double plates, with 139 figures.

Types of the Laramie Flora. (U.S. Geol. Surv., Bull. No. 37.) By LESTER F. WARD. Washington, Government. 8°.

THIS rather bulky bulletin is supplementary to the preceding synopsis. The 139 figures are reproduced on 57 octavo plates, and are accompanied by critical comments, and descriptions of the new genera and species.

NOTES AND NEWS.

ON Tuesday the 20th, in the presence of the secretary of the navy, the naval committee of the House of Representatives, and many representatives of the army and navy of this and other countries, an exhibition was given in New York Bay of the destructive capabilities of the Zalinski pneumatic dynamite gun. The results of the tests made at the time prove conclusively, that, with the present experimental and necessarily imperfect gun, a shell containing fifty-five pounds of explosive gelatine may be thrown with accuracy a distance of one mile, and exploded at the proper moment for producing the maximum of destructive effect. The target used was the two-masted schooner 'Silliman,' eighty tons' burden, late of the United States Coast Survey, but recently condemned, and reserved to be used in torpedo experimenting. She was anchored 1,980 yards from Fort Lafayette, where the gun was stationed. After two trial-shots with blank cartridges, a loaded shell was fired, which struck the water a few yards short of the target. The explosion threw a column of water nearly a hundred feet into the air, and the concussion jarred the vessel so that the mainmast was broken off a few feet above the deck. The next shot struck the vessel at or below the water-line, with an instantaneously destructive result. The schooner was lifted up, fairly torn apart amidships, and the rails were under water in less than thirty seconds, only the foremast and its standing rigging being left in view. All around this floated small fragments of the schooner. In each of these instances the gelatine was exploded by percussion in this way: a small electric battery was affixed to the side, the only thing lacking to start its operation being moisture. A thin piece of blotting-paper kept this out. When the shell was immersed, the moisture admitted generated sufficient electricity to fire a detonator of fulminate of mercury, which exploded the gelatine.

— R. Nahrwoldt has made a series of experiments on the gradual loss of electricity of electrified bodies (*Naturw. Rundschau*, ii. No. 35). In an essay published in 1878 the author proved that the discharge takes place by means of the particles of dust suspended in the air. These are electrified and then repelled from the electrifying body. The result of these experiments led Lodge and Von Obermayer to their method of clearing rooms from smoke. Later on, it was shown that a wire of platina made red-hot by electricity electrified the surrounding air, although it was almost free of dust. For this reason Nahrwoldt resumed his experiments. He found that electricity was discharged through a point only in dusty air. He made his experiments in an air-tight glass shade the sides of which were covered with a thin layer of glycerine. After the dust was precipitated on the sides of the glass through the action of the electricity, the discharge was very slight. As soon as a wire of platina was electrified, and became red-hot, electricity was again discharged through the point. Nahrwoldt concluded that this was due to particles flying from the red-hot wire. This conclusion was proved to be correct by the occurrence of platina in the deposits on the sides, and by the loss of weight of the wire. These experiments led him to the conclusion that air free of dust cannot be electrified statically.

— We learn that the pecuniary loss attending the publication of the *Zoologischer Jahresbericht* has been so great as to make it necessary henceforth to restrict the scope of the work. Systematics and faunistics are to be excluded. The *Jahresbericht* is published under the able editorial supervision of Dr. Paul Mayer of the Naples Zoölogical Station, and has now reached its eighth year. Four heavy volumes have hitherto been issued each year, giving accurate and comprehensive summaries of all the zoölogical work done during the year under review. The *Jahresbericht* is one of the most difficult, most expensive, and at the same time most valuable, zoölogical serials ever undertaken. About thirty reporters (*Referenten*), distributed among different countries, have been employed in collecting, summarizing, and arranging this vast work. The task has been faithfully and most thoroughly accomplished, and we most earnestly hope that the number of subscribers may be at once increased to an extent that will insure its continuance on the same broad plan that has hitherto been followed. The *Jahresbericht* has become our *vade-mecum;* and we can but regard it as a serious misfortune to have its scope narrowed. Are earnest zoölogists in this country willing to see such a work as this interrupted for