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

want of proper support? There are probably not more than half a dozen subscribers in this whole country. Let those who appreciate the importance of the work encourage it by giving it a place in their private libraries.

## LETTERS TO THE EDITOR.

**** *The attention of scientific men is called to the advantages of the correspondence columns of* SCIENCE *for placing promptly on record brief preliminary notices of their investigations. Twenty copies of the number containing his communication will be furnished free to any correspondent on request.*

*The editor will be glad to publish any queries consonant with the character of the journal.*

*Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

### Romantic Love and Personal Beauty.

YOUR reviewer has pointed out that the light and flippant character of Mr. Finck's style prevents his book from being taken as a serious contribution to science. He has neglected to show that the unintermitting vulgarity of its tone will cause it to have an exceedingly vicious effect upon society, if it should chance to have any effect at all. Romantic love is one of the few thoroughly beautiful and elevated things that civilization has yet produced. It is such a means of refining and subduing the brute in man, and of bringing him a little nearer to the angels, as is no other emotion which he has yet developed. When a young man and a maiden are in love, they walk in a very heaven, not of happiness only, but of delicacy and purity. The poets and the worthy novelists have invested the subject with a warm glow of high feeling and noble aspiration, and even the unworthy novelists have not dared to drag it wholly in the dust. It has been reserved for a Mr. Finck to write of it in a tone which is not equalled by the commonest and most vulgar of the daily newspapers. It is incomprehensible that a book which is offered to decent people to read should contain such a sentence as this, to take an instance at random: "Has Mr. Spencer ever kissed a girl?" Romantic love is a precious possession which the race has been slow to gain. It is possible that it is like a delicate flower, which cannot be handled by the botanist without losing its beauty and its fragrance. At all events, it is of immense importance, if it is to become the subject of scientific investigation, that it should not be vulgarized and cheapened at the very beginning by such a manner of writing as this.

Mr. Finck's book contains a number of very clever explanations of minor points in biology and psychology. His main theses are not new; and, as Mr. Conn has pointed out, it is premarital courtship, and not love, that he has shown, or that can be shown, to be very modern. His explanations, while they are extremely ingenious, always need to be carefully examined, and are seldom fortified by his reasons. His conception of how delicate a task it is to establish a relation of cause and effect may be gathered from the following passage: "Large numbers of tourists in Switzerland constantly suffer from headache, simply because they fail to have the head at night in the centre of the room, where it ought to be, because the air circulates more freely there than near the walls." His literary style is on no higher level than his taste and his logic. He speaks of "a blue-blooded youth and a ditto maiden," and of "knocking the bottom out of the theory of Alison, Jeffrey and Co." So utterly regardless is he of the common decencies of language, that it is impossible to attribute it to the proof-reader when we find him saying that one thing is the "very antipode" of another.

The second part of Mr. Finck's book is, if possible, worse than the first. His ideal of beauty is as poor and mean as his ideal of romantic love. That kind of beauty which can be heightened by pomades and powders for the complexion, and by surgical appliances for straightening noses, is not the kind which our descendants will strive to perpetuate. There is something peculiarly gross and offensive about all such topics to a right-minded person; and to find them discussed in fullest detail in a book which is expected to influence scientific opinion on a subject of profound importance, is certainly one of the most curious freaks that a non-insane maker of a book has yet been guilty of. Mr. Finck pretends to be an admirer of expression as well as of mere animal beauty. But a fine and noble expression is absolutely incompatible with such absorption in the details of the toilet as he recommends. It is impossible for a girl to practise 'making eyes' before her looking-glass, as he urges her to do, without showing the marks of that vacancy and insipidity by which "the faces of many fair women are utterly spoiled and rendered valueless." He quotes this other fine passage from Ruskin: "There is not any virtue the exercise of which even momentarily will not impress a new fairness upon the features;" but he is of too insensitive a fibre to know that there is also not any vanity or vice that will not in time ruthlessly destroy whatever is admirable in the face of man or woman. H.

[WE think our readers will find the above letter interesting as containing the strongly expressed views of a woman belonging to that class which believe they have discovered worthy substitutes for some of the attractions which have proved successful hitherto in bringing into existence this much-discussed romantic love. — ED.]

### Grindelia squarrosa.

A VERY interesting find was made here recently by one of the High School boys, who is making botany a specialty. The 'find' consisted of several specimens of a composite plant unknown here before, but which has been decided by several competent authorities to be *Grindelia squarrosa*, a plant said by Coulter to occur "from the Saskatchewan to Texas, and westward to the Sierra Nevadas."

The three or four specimens were found in a pasture, at some distance from the railroad. How they came there is the question which is puzzling those who have seen them, as their true home is said to be so far to the westward. I have heard that a few specimens were once found in Ottawa in this State, but cannot vouch for the truth of the report. L. N. JOHNSON.

Evanston, Ill., Sept. 14.

### The Term 'Topography.'

THE significance of the term 'topography' has undergone a rapid specialization in modern scientific usage that is noteworthy as an indication of the increased attention incidentally given to the study of physical geography. A conspicuous improvement in the methods of geographic teaching in England has been commented on in recent numbers of *Science*, and attributed to a growing recognition of the economic bearing of geographic facts. Mr. Keltie has shown that an entirely novel method of treatment, and a rapid advance, have resulted from this altered attitude. There is, however, tacit admission, to which Mr. Davis calls attention (*Science*, x. No. 240), that the nature of the relations of 'physiography' to human development is but vaguely understood, and that progress is at present retarded by uncertainty of aim. Mr. Davis effectively points out the difficulty: that for teaching-purposes there has not been sufficient inquiry into the principles of geographic evolution, "for topographic development is the key to a real understanding of the forms of the land about us;" that "physiography now is in a low position," and "most immature" as a science in itself. Generalization is as yet difficult, or of questionable profit: "attention should be directed instead to the minute morphology and systematic development of individual topographic forms." Physiography must make the same order of advance that biology has made out of the old natural history, with its aimless catalogues of wonders, and study the "simpler type-forms carefully before attempting to understand the complex associations of forms that make up a country or a continent." Mr. Keltie recognizes that it is "typical aspects of the earth's surface," not "extraordinary features," that will serve the purposes of the new geography; "but," as Mr. Davis points out, "he does not say where we shall find a scientific and sufficient investigation of the forms that are chosen as 'typical aspects.' There is no such investigation. The absence of any thorough and consistent physiographic terminology at once points out the immaturity of this study. . . . 'The Sixth Annual Report of the Geological Survey,' just issued, contains, for example, a number of illustrations that will be seized upon when the proper text-book appears. The choice little woodcuts on p. 229, entitled 'Topographic Old Age' and 'Topographic Youth,' are particularly good, but these terms will certainly be new to most readers." No "scientific and sufficient investigation" of the evolu-