

chosen. If we denote it by  $c$  in any system of units, we may formulate the law as follows:

*Two bodies attract one another inversely as the square of their distance and directly as the product of their masses and  $(1 + 3v^2/c^2)$ , where  $v$  is the component of their relative velocity perpendicular to the line joining the bodies.*

The form (1) is obtained from the Einstein theory on the hypothesis that the planet is small in comparison with the sun. It may be that the above law applies only to this case. However, it may be that the law would work if the bodies were approximately of the same mass. As formulated the law enables one to set up the differential equations of  $n$  bodies in a manner analogous to the classical theory. It would be interesting to know whether known discrepancies in the motion of the moon would be overcome by the use of this law.

Although the term  $3v^2/c^2$  produces an observable effect only in the case of Mercury, it may produce a significant effect in molecular motion.

4. When in like manner equation (7) is compared with (9) we find that for a ray of light the attraction is

$$(14) \quad 3m\omega^2$$

where  $\omega$  may be interpreted as the angular velocity of the light about the sun. Thus it is the term  $3m\omega^2$  in (13) which accounts for the deflection of light, and the term  $m/r^2$  does not enter. Einstein and his followers have calculated the deviation of light by noting that the velocity changes in a manner analogous to that of a refracting medium, and by applying Huygen's principle. Since the same term appears in the attraction of a planet, it may very well be that the sun affects the medium through which both the light and planets pass, and that the difference between Newton's law and (13) is due to this situation. From this point of view one would expect that the law

<sup>1</sup> I have just found that A. V. Bäcklund in the *Arkiv för Matematik, Astronomi och Fysik*, Vols. 14 and 15 (just received) has made an extensive study of the relation between classical dynamics and the Einstein theory of gravitation. In the course of his three articles he obtains equation (11) and one similar to (13).

would not be accurate for two or more bodies of relatively the same mass, but it may lead to a sufficiently close approximation.<sup>1</sup>

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## THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE SECTION F—ZOOLOGICAL SCIENCES AND ASSOCIATED SOCIETIES

At the Toronto meeting of the American Association for the Advancement of Science, December 27-31, 1921, Section F (Zoology) offered no separate program, but met jointly with the American Society of Zoologists. The program was arranged by the latter society.

Six joint sessions were held, the program including 101 titles distributed by subject as follows: embryology, 4; cytology, 8; comparative anatomy, 7; evolution and genetics, 24; ecology and zoogeography (with the Ecological Society of America), 13; general zoology, 2; protozoology, 2; parasitology, 22; comparative and general physiology, 17; unclassified, 2.

The session of Friday afternoon, December 30, was devoted to a symposium on orthogenesis. A biologists' smoker was held Wednesday evening, December 28, and the zoologists' dinner Friday evening, December 30.

The business meeting of Section F took place at the morning session on December 29, with Vice-president Kofoed acting as chairman. M. M. Metcalf is vice-president for Section F for 1922. J. A. Detlefsen was elected a member of the section committee for four years in place of the retiring member, A. M. Reese.

F. R. Lillie presented the following resolutions drawn up by a conference of representatives of the biological societies in regard to a proposed federation of biological societies:

RESOLVED: 1. That it is the sense of this conference that an inter-society conference should be called to study and report upon the feasibility of federation of the biological societies and to develop plans for the said federation.

2. That for the purpose of effecting such an organization, each society, and Sections F and G of the American Association for the Advancement of Science, be requested to designate its president and secretary as members of an inter-

society council which shall be authorized (1) to deal with all matters of common interest, such as pooling of programs, that are consistent with the existing regulations of the constituent societies, and (2) to draw up proposals for a constitution and by-laws of a federation of the societies in question, and to present them for action at the next annual meeting.

The Section voted that the resolutions of the conference be adopted.

Independent programs were arranged by the following societies affiliated with Section F—The Entomological Society of America, The American Association of Economic Entomologists; and by the following societies affiliated with Sections F and G jointly—The American Society of Naturalists, The Ecological Society of America, The American Microscopical Society (business meeting only), The American Nature-Study Society.

HERBERT W. RAND,  
*Secretary, Section F*

#### SECTION G—BOTANICAL SCIENCES AND ASSOCIATED SOCIETIES

SECTION G held its session on Wednesday afternoon, December 28, 1921, in conjunction with the Botanical Society of America and the American Phytopathological Society. There was a large attendance at this meeting, and the symposium, though involving several papers, was not unduly long. Professor Rodney H. True, retiring vice-president for Section G, delivered his address on "The physiological significance of calcium for higher green plants," which has been published in *SCIENCE*, Vol. LV, p. 1, January 6, 1922. The vice-presidential address was followed by a symposium on "The Species Concept," at which the following papers were read: (1) "From the viewpoint of the systematist," Charles F. Millspaugh; (2) "From the viewpoint of the geneticist," George H. Shull; (3) "From the viewpoint of the morphologist," R. A. Harper; (4) "From the viewpoint of the bacteriologist and physiologist," Guilford B. Reed; (5) "From the viewpoint of the pathologist," E. C. Stakman. The writers of these papers cooperated splendidly, both in division of subject matter and in time of presentation. The results seem to confirm the expressed belief of many botanists

that a symposium of general interest, making appeal to workers in all the principal fields, is well worth while.

At the business session of Section G, John T. Buehholz, of the University of Arkansas, was elected to be a member of the section committee, his term of office to end January 1, 1926. Professor F. E. Lloyd of McGill University, was selected as vice-president for Section G for 1922.

*Botanical Society of America.*—This society held sessions beginning Wednesday morning, December 28, 1921, and continuing through Friday. On Thursday afternoon the Mycological Section held a joint session with the American Phytopathological Society, and on Thursday afternoon the Physiological Section met in conjunction with the American Society for Horticultural Science and the Ecological Society of America. At the sessions of the Botanical Society of America, eighty-seven scientific contributions were read. The dinner for all botanists was held on Friday evening. After the dinner Dr. Marshall Howe read "A Communication from the Retiring Vice-president," Dr. N. L. Britton.

*American Phytopathological Society.*—Sessions of this society were begun on Wednesday morning, December 28, and continued until Saturday morning. At the business sessions of this society the following officers were elected: *President*, E. C. Stakman, University of Minnesota, St. Paul, Minn.; *vice-president*, N. J. Giddings, University of West Virginia, Morgantown, W. Va.; *secretary and treasurer*, G. R. Lyman, Bureau of Plant Industry, Washington, D. C. One hundred and seven scientific contributions were read during the sessions. The Phytopathologists' dinner was held on Thursday evening, the dinner being followed by a discussion of important topics, and a short business session.

*Board of Control of Botanical Abstracts.*—Business meetings of the Board of Control were held on Tuesday, Wednesday and Thursday. During these meetings various matters were given attention including the election of editors and various considerations in connection with the publication, financial support, and circulation of *Botanical Abstracts*.