constant column whatever (*cf.* R. A. Fisher, "Statistical Methods for Research Workers" (Blackie and Son, 1925, 1936) Art. 29). The reciprocal solution, like any other determinant solution, is apt to give spurious results in the case of near indeterminacy, and it is this very fact that furnishes the test of stability.

For the normal equations written above, the reciprocal matrix with two-figure accuracy turns out to be

$$A^{-1} = \begin{vmatrix} 141141 & -46962 & -93922 \\ -46961 & 15625 & 31250 \\ -93922 & 31250 & 62500 \end{vmatrix}$$

The large numbers themselves warn of instability. Used as a multiplier, the top row and the original constant column give

$$a = 141141 \times 11.982997 - 46961 \times 14.013002 - 93922 \times 11.001000 = 2.765577;$$

and in like manner the second and third rows give

$$b = 0.852883, \qquad c = 1.705766.$$

The glaring discrepancies between these values and the earlier solutions are evidence of instability, but of course no test was needed in this instance. If common fractions had been used, or all decimals retained, the reciprocal solution would have given a = 1, b = 2, c = 3, which satisfy the equations absolutely.

Some of the notions here expressed have grown from a few ideas brought to my notice by Dr. A. C. Aitken, of the University of Edinburgh, about two years ago; in particular, the suggestion of the reciprocal solution for comparison is his. Such notions concerning near indeterminacy and instability occur readily enough to mathematicians, but not so readily to other scientists and economists who have use for them. The reader will understand that only the algebraic features of the problem are here dealt with; physical significance of figures is another matter. It is interesting, I think, to see that there are both mathematical and physical aspects to the problem.

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PERANEMA AND "GRANTIA"

CONCERNING the second flagellum of *Peranema*,[1] I can only repeat that after prolonged study of normal active specimens under oil immersion I was not able to see any such structure. However, Lackey[2] and Hall[3] have already pointed out that this second flagellum can not be seen in the living animal and is not used in locomotion. My observations were confined to live specimens, and the flagellum is evidently observable only in stained specimens. I was obviously in error in doubting its existence on the grounds of its non-visibility in life. Since writing the article in question[4] I have been able to observe the vacuolar apparatus in *Peranema* and other euglenoid flagellates, and I find that the recent accounts of this apparatus in *Peranema* are erroneous, as is likewise the standard text-book description of the vacuolar system of the Euglenida in general. The contractile vacuole of *Peranema* is a temporary vesicle which discharges into the gullet base and thus completely vanishes, having no continuity with the succeeding vacuole. As each vacuole reaches diastole there appear near it two or three small vacuoles. These are not, as usually supposed, secondary vacuoles opening into the main vacuole, but are simply the droplets whose fusion forms the next vacuole. As the current vacuole disappears, these droplets tumble together into the space which it occupied and unite to become the next vacuole. A similar state of affairs was found to hold for several other euglenoids, both green and colorless, studied.

Dr. de Laubenfels' correction, in the same number of SCIENCE, of an obvious error in the naming of the common little syconoid sponge of the Woods Hole vicinity is welcome, but unfortunately Dr. de Laubenfels omits to mention that *Scypha* is a synonym of *Sycon*. Sponges with the structure of the Woods Hole form have always up to the present been placed in the genus *Sycon* by sponge specialists, and the erroneous name *Grantia* was already corrected to *Sycon* (on the advice of Professor H. V. Wilson and myself) in the last editions of Pratt's "Manual of the Common Invertebrate Animals" and Drew's "Invertebrate Zoology." It now appears that the name *Scypha* has priority over *Sycon,* and hence it will unfortunately be necessary to change the name *Sycon* to *Scypha.* The form *Scypha* (*Spongia*) *coronata* given by de Laubenfels does not conform to the international rules of nomenclature, for a parenthesis can be used in this manner only to indicate a subgenus, as is certainly not the intention here. Consequently the name of the Woods Hole sponge (assuming that the specific identification is correct) should read *Scypha coronata* (Ellis and Solander) 1786, syn. *Spongia coronata* Ellis and Solander.

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A REMARKABLE SABRETOOTH-LIKE CREODONT FROM THE EOCENE OF UTAH

DIRECTOR AVINOFF, of the Carnegie Museum, has kindly sent me for description the lower jaw of a predaceous animal, the nature of which is not apparent

[1] SCIENCE, February 19, 1937.
[2] *Biol. Bull.*, Vol. 65.
[3] *Trans. Amer. Micro. Soc.*, Vol. 53.
[4] *Quart. Jour. Micro. Sci.*, Vol. 79.

at first glance. Examination, however, proves that it is one of the primitive suborders of the Carnivora, the Creodonta, and the remarkable feature is the way in which it has imitated the sabretooth cats of the true Carnivora. The dental formula of the lower jaw is $I\frac{2}{2}$ $C\frac{1}{1}$ $P\frac{4}{4}$ $M\frac{2}{2}$. The second molar is a cat-like sectoral. The lower jaw has protective flanges from the anterior part, which demonstrate that the upper canines were large sabres. The position of the condyle of the mandible and the shape of the coronoid process show that this animal was far advanced in specialization equal to that of the White River *Eusmilus,* the most specialized of all the sabretooth cats. For this fossil the name *Apatælurus kayi* is proposed, the specific name in honor of Mr. J. Leroy Kay, of the Carnegie Museum, who made the discovery.

W. B. SCOTT

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SOCIETIES AND MEETINGS

THE WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS

THE Wisconsin Academy of Sciences, Arts and Letters held its sixty-seventh annual meeting at the Milwaukee Public Museum, Milwaukee, Wisconsin, on April 9 and 10, conjointly with the Wisconsin Archeological Society and the Midwest Museums Conference. About 125 persons attended the meeting.

After a short general session the papers to be read were divided into two sections: Section A, devoted to papers dealing with archeological and museum subjects; and Section B, devoted to papers concerning the several sciences. Fifty-six papers were presented, and these were divided equally between the two sections. Mr. Charles E. Brown, director of the Wisconsin Historical Museum, served as chairman of Section A, and Dr. Chancey Juday, president of the academy, presided over Section B.

The academy held its annual business meeting at 4:30 o'clock on Friday afternoon, at which time it elected twenty-three new members, accepted the resignations of Mr. Walter M. Smith, librarian, and Dr. R. R. Shrock, secretary-treasurer, and elected Mr. Gilbert H. Doane, librarian, and Dr. Loyal Durand, Jr., secretary-treasurer.

The annual academy dinner was held at the Hotel Schroeder at 6:00 o'clock on Friday evening, with 44 in attendance. Immediately after the dinner, members and guests returned to the museum, where Drs. Joel Stebbins and A. E. Whitford, of the Washburn Observatory, presented the evening lecture on "Gadgets and Galaxies," in which they demonstrated the use of the photo-electric cell in the study of stars and galaxies. The audience numbered over 150.

Officers for 1937–38 and 1938–39 are as follows:

President, Chancey Juday, University of Wisconsin.
Vice-president in the Sciences, Paul W. Boutwell, Beloit College.
Vice-president in the Arts, S. C. Wadmond, Delavan, Wisconsin.
Vice-president in Letters, Julia Grace Wales, University of Wisconsin.
Secretary-Treasurer, Loyal Durand, Jr., University of Wisconsin.
Librarian, Gilbert H. Doane, University of Wisconsin.

R. R. SHROCK,
Secretary-Treasurer

THE ARKANSAS ACADEMY OF SCIENCE

THE twenty-first annual meeting of the Arkansas Academy of Science was held at the University of Arkansas, at Fayetteville, on March 26 and 27.

The annual public lecture was presented by Dr. T. S. Painter, of the University of Texas, and the title of the address was "Recent Developments in Our Knowledge of Chromosome Structure and Their Bearing on Genetics." The lecture was presented under the combined auspices of the academy and the University of Arkansas Sigma Xi Club.

A feature of the meeting was a Conservation Symposium. The following speakers contributed to the meeting as follows: "The Conservation of the Minerals of Arkansas," G. C. Branner, state geologist; "Soil Conservation," G. E. Riddell, assistant state coordinator, Soil Conservation Service; "Wild Fowl Conservation," Robert Smith, White River Migratory Waterfowl Refuge, U. S. Biological Survey; "Relation Between Forest and Game Preservation," H. A. Miller, White River Migratory Waterfowl Refuge, U. S. Biological Survey; "Forestry in a Conservation Program," R. D. Stevens, University of Arkansas; "Conservation Aspects of the Resettlement Administration," T. Roy Reid, regional director, Resettlement Administration, Region 6.

The following officers were elected for 1937–38: *President,* W. C. Munn, Magnolia A. and M. College; *Vice-president,* T. L. Smith, College of the Ozarks; *Secretary,* L. M. Turner, University of Arkansas (re-elected); *Treasurer,* W. R. Horsfall, University of Arkansas (re-elected); *Editor,* I. A. Wills, John Brown University.

The 1938 meeting will be held at the College of the Ozarks, at Clarksville.

LEWIS M. TURNER,
Secretary