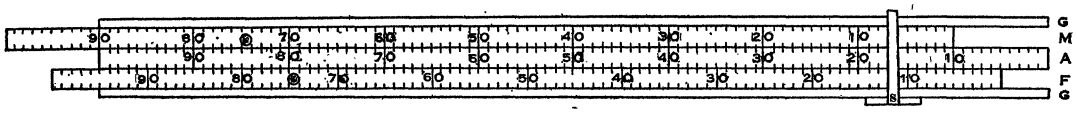

FIG. 1.

movement a small knob, *K*, is screwed to each of the movable sticks. A slider, *S* is made like a small T-square. It crosses the sticks at a right angle and can be moved freely along them. The two guides are slightly thicker than the meter sticks so that the movement of the slider does not change the position of the movable meter sticks. *M* is used in determining the age of the male and *F* that of the female. For the sake of simplicity the millimeters are not shown in the figure.

The method of using this device is best illustrated by an example. Suppose the male of a pair was born on April 10, 1919, and the female on February 19, 1919. The first date is the 100th day of the year, and the second date is the 50th day. A calendar having all the months of the year on one page and also having each day in the year numbered consecutively from both the beginning and the end of the year is used for determining what day in the year a certain date represents. Stick *M* is moved until its right end is even with the 100-millimeter mark on *A* and *F* is similarly moved to the 50-millimeter mark. If a weighing were made on June 9, 1919, which is the 160th day of the year, the slider is moved to the 160-millimeter mark on *A*. The age in days of each animal is now indicated on their respective sticks by the number of millimeters to the right of the slider. That is, the male is 60 days old and the female 110. If the age is to be computed on November 27, 1919, the 331st day of the year, the slider is moved to 331 on *A* and the age of each at once read off, which is 231 and 281 days respectively. The ages at any date in 1919 can thus be computed without moving anything but the slider.

If a date occurs in the succeeding year, 1920, then the sticks would require resetting. This is done in the following manner. The slider is moved to the 365 mark on *A*, which represents the last day of 1919, and the readings taken on *M* and *F*. These are 265 and 315 respectively, that is, the ages on December 31. These two numbers may also be found on the calendar since they are the days in the year when numbered consecutively from December 31 to January 1 corresponding to the two dates of birth. *M* is now moved to the right until its 265 millimeter mark is even with the end of *A* and *F* is moved in a similar manner until its 315 mark is even. This arranges the instrument for any date in 1920. If the ages are desired on March 28, 1920, the 87th day of the year, the slider is moved to 87 on *A* and the ages of the two animals are at once indicated as 352 and 402 days respectively. In this manner the ages may be rapidly determined for any date desired. It is obvious also that the device can be arranged to give the ages when the two animals are born in different years.

The limit of capacity of this device is 1,000 days. But in dealing with animals with a longer span of life each millimeter can represent a week, a month, or a year and the ages computed in these periods of time.

The excuse for this article is the hope that it may help some one who is confronted with a series of tedious computations similar to the ones with which I have had to contend.

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THE CLASSIFICATION OF THE OPALINIDÆ

I HAVE completed a study of one hundred and thirty-four species and twenty subspecies which according to the prevalent usage would be included in the genus *Opalina*. Twenty-four species were known before. My material, obtained mostly from the United States Na-

tional Museum through the great kindness of Dr. Leonhard Stejneger, is thoroughly representative for the whole western hemisphere and includes many forms from all other parts of the world, Africa, Europe, temperate Asia, the East Indies and Australia being well represented. Southern Asia is the only region from which there is but little material. Clear presentation of the taxonomic conditions shown in the rather large amount of data necessitates a more elaborate classification of the Opalinidæ than that generally in use. In the year 1918 I published a classification of the Opalinidæ. The completed review of all the material shows that this classification, if elaborated somewhat will be a clearer expression of the real facts. I therefore now propose the following classification:

Ciliata
  Protociliata
    Opalinidæ
      Protoopalininæ
        Protoopalina
        Zelleriella, new genus
      Opalininæ
        Cepedea, new genus
        Opalina
          Opalinæ angustæ (occidentales)
          Opalinæ latæ (orientales)
  Euciliata

The Opalinidæ are placed as an appendage of the Ciliata, being separated from the other Ciliata by the fact that they have not developed macronuclei and micronuclei, and by some features of their life history. They show, both in their structure and possibly in their life history, decided indication of relationship to the Trichonymphidæ which are usually regarded as an appendage of the Flagellata.

From the Opalinidæ I exclude all the genera of Ciliata astomata, which have nuclei of two sorts, leaving, only those forms which, with the exception of my own recent usage, have been included in the genus *Opalina.* The Opalinidæ include both binucleated and multinucleated species and these should be assigned to distinct subfamilies.

The Protoopalininæ include the genera *Protoopalina* (cylindrical binucleated forms) and *Zelleriella*[1] (flattened binucleated forms). The Opalininæ also include two genera, *Cepedea*[2] (cylindrical multinucleated species) and *Opalina* (flattened multinucleated species). The latter genus includes two groups of species—the western hemisphere forms, which are for the most part narrow, especially posteriorly, and the eastern hemisphere species, all of which are broad. All the other Ciliata may be classed as Euciliata in distinction from the Protociliata which include only the Opalinidæ.

There are two species which do not accurately fit into this classification as defined. They are *Protoopalina quadrinucleata* from *Rana macrodon* of Java and *Protoopalina axonucleata* from *Bufo bufo asiaticus* of eastern Asia. These species will be described in a paper soon to go to press. They are mentioned here merely because the former usually has four nuclei and the latter usually shows six to twelve nuclei. They are transitional forms between the genera *Protoopalina* and *Cepedea,* but are classed with the former genus because of the histological character of their nuclei which resembles that of the *Protoopalina* nucleus.

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The Orchard Laboratory,
Oberlin, Ohio,
May 20, 1920

THE OHIO ACADEMY OF SCIENCE

The thirtieth annual meeting of the Ohio Academy of Science was held at the Ohio State University, Columbus, May 14 and 15, 1920, under the presidency of Professor F. C. Blake. Sixty-nine members were registered as present; thirty new members were elected.

The executive committee reported the completion of the affiliation of the academy with the American Association for the Advancement of Science in accordance with the plan adopted by the association at the Christmas meeting.

[1] Named for Ernest Zeller who in the year 1877 published a fine paper upon the European species of the family.

[2] Named for Cassimer Cepede whose studies upon Ciliata astomata clearly showed that the Opalinidæ are to be regarded as quite distinct from the other astomatous forms.