Lake the two layers in the thermocline that were more transparent than the epilimnion were only a few centimeters thick. In some series certain layers in the hypolimnion were more transparent than the epilimnion.

Preliminary tests show that part of the material which causes the lower transparency can be removed from the water with a high-speed centrifuge. In one case Daphnias were found in considerable numbers in the layer with low transparency; plate counts also show that bacteria are more numerous in the layers with minimum than in those with maximum transparency.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

USE OF THE LANTERN FOR OBJECTIVE EXAMINATIONS

THIS method has been used with large classes in elementary physiology in the General College and other divisions of the University of Minnesota.

At the beginning of the term each student is assigned to either an odd or an even numbered seat. Sometimes the class is merely divided into odds and evens and told to take seats accordingly. The odds are known as Division A, the evens as Division B.

Each student receives a stapled packet of about 25 mimeographed slips, 11 by 4½ inches, pink for A's and blue for B's. Students are instructed to bring these slips to lectures. The slips have space for student's name and 25 numbered blanks for answers to questions. At the top is instruction for A's to answer only "A" questions, B's only "B" questions.

Slides of ordinary type and size are used. The usual slide holder permits illumination of an area 3 by 3½ inches. Judicious whittling will increase the area exposed to 3¼ by 3½, the cover glasses being bound together only at ends. On this area six short questions can usually be typed, three A's and three B's. If questions are longer, four are typed on each slide.

The "Radio-Mat" method of typing slides is used. However, as sold, these expose an area of only 2¼ by 3 inches. We find it cheaper and more convenient to buy the red copying paper and Cellophane in letter-size sheets, cutting the copies into proper size before mounting between glasses.

Any of the ordinary objective types of questions may be used. Omission of unnecessary words and use of understood abbreviations shorten questions and increase number on each slide.

A sample slide, alternative answer type, is shown below. Students understand the symbol / as separating alternative answers and equivalent to the word "or." The same questions are given to both divisions but in different order.

A1 Conditioned reflexes investigated: Pavlov/Sherrington/Cannon/Magendie.

A2 Example involuntary non-reflex activity: constriction pupil/ciliary action/goose flesh/swallowing.

A3 Chief motor tracts cross: cerebrum/cerebellum/medulla/cord.

B1 Respiratory center located: cerebrum/cerebellum/medulla/cord.

B2 Example smooth muscle reflex: sneezing/winking/knee jerk/blush.

B3 Autonomic N.S.: wholly efferent/wholly afferent/mixed.

Teachers having lanterns for opaque projection could doubtless make direct use of typewritten questions.

A quiz may include any number of questions. We have used ten to fifty. Usually one purpose has been to take a roll call and check tardiness. Unannounced quizzes of ten questions served these purposes.

Almost no cheating has been observed. Although in adjacent seats, the odds and evens are too busy concentrating on their respective jobs.

Slides are filed for use with future classes. Usually copies of questions are posted after quizzes.

Last year we experimented with two lanterns. This method has the advantage of permitting a larger number of questions on view at a given time, "A"s on one screen, "B"s on the other. It also makes it easier to use multiple choice answers, questions on one slide, answers on the other.

Several members of the physiology staff made useful suggestions, especially Drs. Hugo Miller and Carroll Bellis.

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APPARATUS FOR PRODUCING CUMULATIVE AND ORDINARY TYPE KYMOGRAPH RECORDS SIMULTANEOUSLY

A QUANTITATIVE representation of physiological data given by the ordinary type kymograph record would, in many instances, be of advantage, particularly so in the comparison of sets of data. A method has been described[1] by which this may be accomplished in measuring the activity of small animals. The present article presents a method applicable to a much wider range of experimentation. A simple muscle preparation will serve to illustrate the method.

[1] K. M. Wilbur, SCIENCE, 84: 2177, 274, 1936.