A careful examination of the observation errors in a given problem ought to yield in general a fair estimate of the precision, even if the problem is the prosaic task of counting individuals, and the more imposing the array of significant figures, the greater the obligations of the computer to defend his results.

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THE NAMES SIMIA, S. SATYRUS AND PITHECUS

THE attention of the zoological profession is invited to the fact that the proposition is before the International Commission on Zoological Nomenclature to reopen the case of *Simia*. In its present form the proposition is for the commission: (a) absolutely to suppress the generic names *Simia* and *Pithecus* and the specific name *Simia satyrus*, on the ground that retention of these names and the application of the rules to them will produce greater confusion than uniformity; (b) to insert into the Official List of Generic Names, *Chimpansee* Voigt, 1831, 76, for the chimpanzees, *Pongo* Lacépède, 1799, type *pygmaeus* 1760, for the orang-utans and *Macaca* Lacépède, 1799, type *sylvana* 1758, for the Barbary ape.

The argument before the commission gives an extensive historical review of the subject; this will be published in Bulletin 145, Hygienic Laboratory.

Briefly summarized, the argument maintains: (1) that because of the importance of the Primates in connection with investigations on infectious diseases, the nomenclature of certain genera has passed far beyond a status in which this subject is of importance only to zoologists in general and to mammalogists in particular; (2) that it is absolutely essential that unambiguous names be adopted internationally for experimental animals used for studies dealing with problems involving the life and death of human beings; (3) that the names *Simia, Simia satyrus* and *Pithecus* are so confused in zoological literature as to preclude hope of reasonable uniformity in their use in zoological, bacteriological, serological and public health work; (4) that the safest solution is to suppress these names entirely; (5) and that the International Commission should select thoroughly unambiguous and suitable substitutes which will preclude possibility of confusion in interpreting results as reported by bacteriologists and others in different countries—results which deal with human life.

The secretary will delay announcement of final vote until about September 1, 1927, in order to give to zoologists, bacteriologists and others who may be interested time to consult the premises formulated in Bulletin 145, and to express their views to the commission. Application for copies of Bulletin 145, Hygienic Laboratory, should be addressed to "Surgeon General, U. S. Public Health Service, Washington, D. C."

C. W. STILES,
Secretary to Commission
HYGIENIC LABORATORY, WASHINGTON, D. C.

SAND FLOTATION ON LAKES

IN connection with the articles on sand flotation which appeared in SCIENCE on April 16 and June 4, 1926, it may be stated that this phenomenon has been observed on two lakes in northern Wisconsin; it was noted on Trout Lake on July 2, 1925, and again on May 9, 1926, and on Tomahawk Lake on May 15, 1926. On July 2, 1925, some biological observations covering an area about four hundred meters long and one hundred meters wide were made along the shore of Trout Lake, and patches of floating sand were found over this entire area; no attempt was made, however, to ascertain the full extent of the water thus affected. On May 15, 1926, patches of floating sand were found along the shore of Tomahawk Lake, covering an area about two hundred meters long and fifteen to twenty meters wide; it was estimated that the floating sand covered between five and ten per cent. of the surface of the water within this area. The patches ranged from one centimeter to about five centimeters in diameter. Sand grains of various sizes were found in this material, the largest measuring 2 x 1.2 x 1 millimeter.

In both lakes the floating sand was found along sandy shores and beaches, and there was a moderate offshore wind in each instance, to which agent the phenomenon was attributed.

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SCIENTIFIC BOOKS

An Introduction to Cytology. 2d edition. By LESTER W. SHARP. New York, McGraw-Hill Book Co., 1926. Pp. xiv + 581.

A NEW edition of this widely used work will be heartily welcomed. The book has been largely rewritten and its scope has been in some respects materially extended. Especially noteworthy are the fuller consideration given to discussions of the physico-chemical structure of protoplasm and of cytoplasmic inclusions in the light of recent studies; the author's modified attitude toward the achromatic mechanism concerned in mitosis; the illuminating discussion and summary of meiosis and the more extensive review of our knowledge of animal cytology. As in the former edition, the illustrations are admirably chosen and technically excellent. An important improvement is the inclusion of the bibliography in one alphabetic list.

The author has evidently felt the difficulty of compressing within a still very limited space the results of research in so vast a field. Necessarily his discussions are abridged at times to not greatly more than a list of the investigations on a particular topic. Frequently readers will wish that it had been possible to clothe the meager skeleton of summary with somewhat more of the flesh of discussion. The alternative, of course, was an increase in bulk and expense that would have rendered the work less suitable for use as a text-book. As it stands, it is a masterpiece of organization and summarization and at the same time surprisingly adequate as a volume of reference.

However near perfection a piece of work, divergent opinions will persist upon various points regarding which the author has been compelled to take a stand. A few matters of difference, trifling or otherwise, may be mentioned.

At several places in the book there is a confusion of *cell plates* with *cell walls* and of *planes* with *lines*. One may venture to regret the use of such redundant and awkward expressions as *sperm cell, egg cell* and *spore cell*. The diagram of a cell on page 56 is unsatisfactory to a botanist because of the omission of plasma membrane and wall. It may be urged that walls are not present about all cells, but neither are centrosomes or plastids invariable cell constituents, yet these are included in the diagram.

The word *homology* has a sharply defined meaning, generally accepted; but it is difficult to determine what definition of the word is in the author's mind when he speaks of the protozoan body and ordinary tissue cells as not homologous (p. 59), of the bodies of *Vaucheria, Cladophora* and *Stigeoclonium* as "surely homologous" (p. 73) and of the protozoan as homologous with the whole man (p. 79). The term "homologous chromosomes" is also misleading, since little if anything is known as to the homologies of chromosomes; but in this respect a well-established custom is followed.

Unfortunate, too, is the definition of "the prophase" as covering the whole series of *prophases,* and similarly for "the anaphase" and "the telophase." Sharp's usage in this respect in his first edition has led some younger writers into confusion, and the error is preserved in the present revision. Strasburger's definitions of *prophases, anaphases* and *telophases* as series of stages have been adhered to by practically all careful writers since the terms were introduced; and properly, since a succession of transformations is not a *phase*. The use of "the metaphase" as substantially synonymous with "equatorial-plate stage," on the other hand, is justified by rather wide usage. The shift that has taken place in the meaning of this term is also, however, to be deplored; "equatorial plate" needs no synonym; and it is preferable to retain the original significance of "metaphases" as including the stages from the arrangement of the chromosomes in the equatorial plate to the moment of the completed separation of the daughter chromosomes.

The author finds himself in difficulties, as we all do, in attempting to classify the substances found within a living cell. He says truly (p. 50):

> The fundamental fallacy involved in much of the speculation on this subject lies in attributing the properties of a system to one or more of its constituent elements, and consequently in attempting to draw a sharp line between "living" and "lifeless" components. . . . It can not be emphasized too strongly that protoplasm is a *living system* of components which of themselves are non-living.

He treats, nevertheless, with unneeded tenderness some of the once helpful but now largely meaningless classifications proposed for "living," "less actively living" and "non-living" constituents of protoplasm and even adopts some of the terminology based upon these classifications. The result is a feeling on the part of the reader of a certain lack of consistency. Similar difficulties attend the discussion of cytoplasm, which seems to be considered as not including, for example, vacuoles—although it is pointed out (p. 31) that "any distinction between large vacuoles, alveoles and ultramicroscopic colloidal masses of the same material is more or less arbitrary." Cytoplasm, like protoplasm, can not workably be so defined as to exclude substances that are or are thought to be "non-living."

Perhaps the most interesting feature of the book to the critical reader—as it evidently is to the author—is the latter's definite espousal of the "organismal" viewpoint. He reviews at some length the ideas of previous writers whom he classes as advocates respectively of the "cell theory" and the "organismal theory." While this classification may be pedagogically useful, it is evident from Sharp's clear analysis that, like most classifications, it is strictly artificial. The views of the writers cited represent in fact an intergrading series of conceptions ranging from Schleiden's and Schwann's version of the cell theory to notions that verge upon vitalism. The older of these discussions were important in their time as statements and clarifications of problems to be attacked; the later ones are far from indispensable. Enough facts have been accumulated to enable us to deal concretely with biological phenomena. It is clear, for example, that those plants and animals which represent the dominant trend of evolutionary development are composed of cells, usually but not

always uninucleate, which despite their interrelations grow, divide and otherwise function as units. It is likewise clear that certain groups of organisms illustrate phylogenetic possibilities of a very different nature. The concept of the cell, based upon conditions in "higher" animals and plants, can, to be sure, be applied without serious distortion to the plasmodium of a slime mold or to the coenocyte of Vaucheria. Whether or not this possibility is insisted on, cytological study at present concerns mainly the predominant "cellular" type of organization. A clear analysis of the structure and functions of organisms so constituted, whatever may be true of other types of organization, is possible only in terms of cells. Witness the misty results of attempts to make such an analysis in other terms. It is interesting that, although Sharp announces himself an organismist and conscientiously reproclaims his faith from time to time, his discussion of almost all the problems he deals with is in terms of cell structures and cell functions. From one point of view it is immaterial if a biologist thinks abstractly of a plant or animal as a whole which organizes itself into cells, so long as he actually treats the cells as units which by growing, dividing, remaining adherent and undergoing differentiation organize themselves into a plant or animal.

Viewed in another aspect, however, the difference between these conceptions is more important. Experience shows that progress is to be made in the study of complex organisms by accepting the fact of cellular organization and by using this fact as a means of analysis; whereas the concept of "the living system as a whole" exercising a mysterious control over its cells leads as to an inevitable corollary to the doctrine that "the organism is more than the sum of its cells"; and the whole-hearted acceptance of this in turn to confused thinking, mysticism and sterility. There is good reason to hope that our author's interesting adventure into this perilous field will end in a realization of the troubles ahead.

CHARLES E. ALLEN

SCIENTIFIC APPARATUS AND LABORATORY METHODS

IMPROVEMENTS IN ALPHA-RAY TRACK APPARATUS

THE apparatus recently described by the writer and N. E. Sowers[1] has been still further simplified and standardized through the experience of the past few months, and hence a brief note regarding its present form seems justified.

[1] *Jour.* Optical Society of Amer., Vol. 11, No. 2, Aug., 1925; Proc. Ind. Acad. Sci., Vol. 34, 1925.

Its appearance in elevation is shown in Fig. 1a. The containing vessel is blown into form from a pyrex glass Erlenmeyer flask. A tungsten wire C, making contact with the upper inside flat surface, forms one electrode M, while another wire D, fused through the body of the flask, forms the other electrode N, which in reality is the surface of the water. A nipple P is placed near the surface M and through it is supported the glass cane on the inner end of which is mounted the radioactive material so essential to the success of the experiment. The manner of mounting this cane is shown in Figs. 1a and b. The tap T is for filling the vessel with water, which is readily done by compressing the bulb RB. The water level should be at N, distant about 1.3 cm from M.

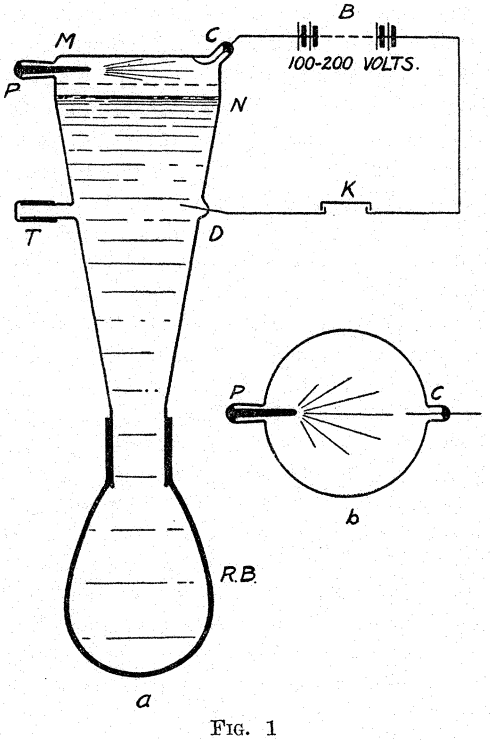

FIG. 1

The necessary electrical connections are also shown in Fig. 1a. For best results one hundred to two hundred volts (an ordinary B battery in radio) should be placed in the circuit, though good results are obtained by connecting directly to a 110 D.C. source. The 100 A.C. lighting source will not work. In making the electrical connections it is not necessary to pay any attention to polarity, or to earthing, or, as was commonly supposed, to arrange for *closing* or *opening the circuit* at proper intervals when producing the alpha-ray tracks. The space between the plates M and N must be illuminated. A shielded 60 watt, 110 volt, mazda lamp answers very well. Fig. 1b is a view of the top looking down.