ern Protestant holy inquisition. It is of course unthinkable that these bodies will in any degree whatsoever meet the desires of the fundamentalists so that the latter will be forced to carry their fight into the legislature of next winter.

Well financed, the Committee of One Hundred has imported fifteen speakers under the direction of Mr. T. T. Martin, head of the Bible Crusaders of America, who will, in addition to local talent, prepare the counties for the June primaries where the next legislature is made. There seems to be little doubt that this theological raid on education in North Carolina will assume much more serious proportions than it did a year and a half ago when an anti-evolution bill met defeat. The Rev. Mr. Martin states that North Carolina is "pivotal" and that if it can be won the nation can be also.

An interesting corollary is a possible paradoxical situation created by the fact that the Baptist and Methodist institutions, Wake Forest and Duke, respectively, are standing firm for freedom of teaching. Thus in case the fundamentalists swamped the state institutions, it would become desirable, to prevent the "ruin of youth," to transfer the young men in the church schools to the "safe" state fundamentalist colleges.

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QUOTATION

LEADERS IN MEDICINE

THE science of medicine has suffered heavy loss by the deaths within the last few days of Sir William Leishman and Sir Frederick Mott. Both were pioneers in the truest sense of that word; in both a lively imagination was disciplined by unswerving fidelity to the truth; to both it was given to render signal service to their generation and to posterity. Leishman was a soldier, and it is not straining the use of language to say that he carried the ideals of his profession into his scientific studies. His work—with Wright—on the prevention of typhoid fever, thanks to which that immemorial scourge of armies was practically eliminated during the Great War, was in its essence a discipline of the natural powers of resistance to disease imposed before inevitable exposure to infection took place. The discipline of the parade-ground aims at a similar if a larger object. The patience and courage necessary to this work on typhoid fever were of the highest order. They were displayed again and again in Leishman's life, and never more conspicuously than in his studies of Kala-azar. This soldier, indeed, took no discharge in the war against disease.

In that respect his service closely resembled Mott's. The distinguished pathologist of the London County Asylums died, literally, at his post, at a moment when he was pursuing in old age the aims which had fired his youthful enthusiasm. The guiding principle of Mott's life was the determination to discover, if possible, the real causes of insanity. He believed that "mental disease" possesses, in many instances at least, a physical basis, and he worked successfully to justify that faith. His labors, as is now evident, opened a new epoch in the study of lunacy. There are visible to-day powerful stirrings of the old stagnant waters of asylum life. Indeed the very word asylum has been abolished in favor of the more hopeful term "mental hospital." "Hotel-keeping and oratory," as the duties of medical superintendents of those institutions were once cynically defined, have give place to a new interest in research and a new determination to afford to the mentally afflicted all the benefits which are enjoyed by those who are sick in body. This enterprise is still in its earliest phase, but the course of its evolution is no longer in doubt. The debt which humanity owes to Mott is certain, therefore, to increase immeasurably as time goes on. He was a maker of modern medicine, an architect of that healthier and happier future in which he so passionately believed.—London *Times*.

SCIENTIFIC BOOKS

Life and Evolution; an Introduction to General Biology. By S. J. HOLMES. iv + 449 pp., 227 figs. New York, Harcourt, Brace and Co. 1926.

HOLMES has added another to the considerable list of introductory text-books of general biology written by American professors in the last decade. It shows the same tendency that most of them do, to treat the subject more as a physiological and philosophical one than did similar treatises of twenty years ago, with scant attention to morphology and classification, which formed the backbone of biology prior to 1900. The tendency coincides with the direction of growth of the subject and it is natural that this should be emphasized in an up-to-date text-book. But a pedagogic question suggests itself as to whether the older aspects of the subject are not being too much neglected in our elementary biological teaching. Is there such a thing as a biogenetic law governing the acquisition of a knowledge of biology? Should the pupil progress in the order of the developmental stages of the subject? The professors who write the text-books have themselves been well grounded in anatomy, morphology and classification. Will their pupils attain the desired point of view without climbing up this ladder, or may the beginner be taken by the coat collar and

landed at once on the top rung? However this may be, Holmes can not be accused of making false pretenses. He entitles his book "Life and Evolution" and discusses the elementary facts of organic life to such an extent only as seems indispensable to a clear understanding of evolution. His material is well selected, presented in an interesting way, and his reasoning is well balanced and judicial. The newer aspects of zoology, such as experimental embryology and genetics, are adequately reviewed. Organic evolution, on which subject the author has written much and ably, is treated with especial fulness and clarity. As the title of the book indicates, this is its objective, a worthy and timely one in view of the renewed popular interest in the subject. Holmes's moderate and judicial treatment of it is much better calculated to promote clear thinking and sound conclusions than some ill-tempered and denunciatory writings that are enjoying wide popularity at present.

There is this to be said in favor of the newer type of general biology course as outlined in Holmes's book. Biology is presented as a subject with lively human interest and eminently practical in its bearings on everyday life. The reproach that used to attach to the bug-man or the flower-man in the public eye, as an impracticable chaser and classifier of useless things, does not attach to the newer biology. A book such as Holmes has produced can be read with interest and profit by the intelligent layman no less than by the college student.

Evolution, Genetics and Eugenics. By H. H. NEWMAN. 2nd Edit., xx + 639 pp., 99 figs. Univ. of Chicago Press. 1925.

NEWMAN has attempted a useful but difficult task, to cull the best things from all the standard books on evolution and genetics and to bring these together in a single volume for the use of his pupils. The idea appeals to every teacher as just what he would like to do for his class, and this perhaps accounts in part for the obvious success of Newman's book, now in its second edition. But when one comes to the execution of this ideal plan of text-book making, he encounters serious difficulties. What Darwin, Wiesmann, Conklin or Thompson wrote about a subject was in its original setting a masterly statement, but removed from that setting, clipped to fit into the limits of a paragraph, and put together with clippings from other writers into a single chapter, it may lose much of its value. The whole now lacks unity, orderliness and logical sequence. What was meant for a symposium of the masters has become a hash of disconnected opinions, one of which, so far as the reader can see, is as good as another. A scientific scrapbook does not make a good text-book.

It is also in questionable taste to devote a chapter in a science text-book to the Scopes trial and related matters more or less mixed up with religion and politics. What has a dignified text-book to do with propaganda? It is the business of science to discover truth, and of a science teacher to inculcate methods of discovering truth. But it is not the business of a scientist to cram any one's opinions down the throat of the public. Let the fundamentalists and modernists have their fight out in the churches and courtrooms, if they will, but let us keep the halls of science clean.

Heredity. By A. F. SHULL. xi + 287 pp., 111 figs. New York, McGraw-Hill Book Co. 1926.

THIS book differs from all other text-books on the subject in that it is designed primarily for those with no previous knowledge of biology. Incidentally one who reads it attentively will acquire a considerable knowledge of several phases of biology. The author finds an interest in heredity wide-spread among college students outside as well as inside of the biological department. He believes the same to be true outside the colleges, and has undertaken with marked success to tell the public what heredity is, how it acts and what practical application it has, particularly in human society. The book is scientifically sound, well written and illustrated, and admirably adapted to fill its purpose, that of giving authoritative information to the public about heredity and eugenics.

Experiments in Genetics. By C. C. HURST. xxiv + 578 pp., 175 figs. Cambridge (Eng.) University Press. 1925.

THIS volume includes the more important papers of the author on the genetics of plants, animals and man, published in various journals in the thirty-year period, 1894–1924, here brought together and republished from Trinity College, Cambridge. The first four papers deal with experiments in the hybridization of orchids, inspired by reading Darwin's "Fertilization of Orchids," and carried out in the pre-Mendelian era. The author was fortunate in being closely associated with Bateson subsequent to 1900 and had a large share in the wonderfully fruitful work of the group of Mendelians headed by Bateson. Hurst's investigations cover a wide range of subjects. His studies of the hybridization of orchids acquired new significance and were interpreted in new ways after the rediscovery of Mendel's law. He also repeated and verified some of Mendel's experiments with gar-

den peas; made experiments showing Mendelian inheritance of coat-characters in rabbits (Angora coat, albinism, gray coat, Dutch markings); and made experimental crosses between four breeds of poultry, involving a large number of character differences in plumage, comb and other morphological characters. He established an experimental farm at Burbage, where he was on more than one occasion host to visiting scientists from British Association meetings or international congresses. Here he conducted breeding experiments with horses, showing among other things that chestnut color is a Mendelian recessive to bay. He also demonstrated Mendelian inheritance in the fruit colors of tomatoes, red, yellow or white.

At Burbage Hurst made a valuable study of eye-color in man, making a personal examination of the eye color of entire families, parents and children, and thus securing data of unrivalled accuracy and value. He established for the first time the true nature of blue eyes, a Mendelian recessive character, in which the iris lacks pigment on its anterior wall. Other human studies made by Hurst relate to hair color, skin color, left-handedness, musical ability, etc. He made extensive studies of egg-production in poultry crosses, but these, like the horse-breeding experiments, were largely terminated by the war. His principal post-war studies relate to the genus rosa, in which he regards polyploidy, species hybridization and apomixis as important agencies in the production and spread of new specific or subspecific forms.

Truly Hurst's work forms a remarkable record of varied and productive activity, in a period in which genetics came into existence, a genesis which Hurst personally saw and of which he was a part. Long may his fruitful labors continue.

W. E. CASTLE

BUSSEY INSTITUTION

SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE MEASUREMENT OF SURFACE TENSION BY MEANS OF A CHAINOMATIC BALANCE

DURING investigations on the penetration of killing agents into weeds, it became necessary to determine the surface tension of the fluids used. No apparatus was available for these tests, so use was made of a Chainomatic balance as a modification of the standard ring method of determining surface tension. Counterbalanced wires were hung from the lower pan hooks on the beam ends of the balance, the left-hand wire terminating in a small platinum wire bent into a circular loop of known size, at right angles to the line of pull. The scale pans were left on the balance and an old dissecting microscope stand was used to carry the vessel of liquid to be tested. The foot of this microscope was milled out so as not to touch the oscillating scale pans and an arm and tray were soldered to the rack and pinion to hold a vessel of the liquid to be tested.

In using this device the balance beam is lowered and the vessel of the liquid raised by the rack and pinion of the dissecting microscope so that the surface of the liquid comes in contact with the wire loop hanging from the balance. Care must be used in keeping the wire loop clean. By adjustment of the rack and pinion, equilibrium is established with the pointer needle at zero. The sliding scale of the "Chainomat" is then lowered slowly until the film holding the loop breaks. The reading of the scale indicates the weight necessary to break the surface film. From this and the known size of the wire loop the dynes tension may be calculated.

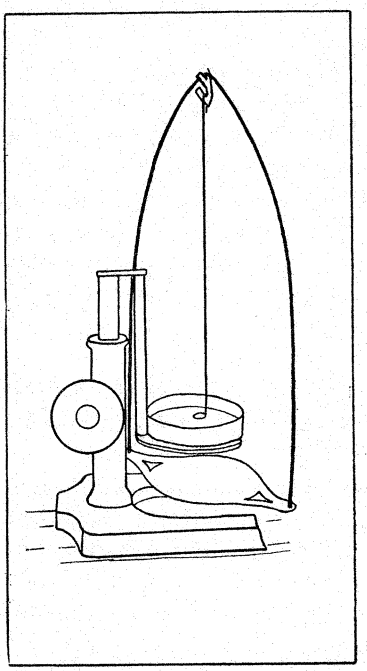

Diagram showing use of old dissecting stand and Chainomatic balance in measuring surface tension.

This instrument has been used quite successfully to date in making surface tension readings. Its cheapness and ready convertibility, coupled with the fact that quite small quantities of liquid may be tested, recommend its use where other methods are not available.

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