in your recent issue would be engaging in their frankness, did they not suffer from the vice of banality. It is such a commonplace to start with the premise that this nation is through and through "commercial," and to deduce therefrom the conclusion that our colleges and universities are commercialized, from which, in turn, all the deficiencies of our educational practise are explained. This deductive method, which would now-a-days be dismissed as absurd in the natural sciences, is still the common approach to educational problems, and is precisely the method which must be gotten away from before educational reform can have a scientific basis. Another defect of the author's method is a loose use of such terms as "commercial." Now commerce is at once a gigantic business and a pursuit of gain. In the latter respect it does not differ, to be sure, from other economic activities, yet its name, when used as a tool of deprecation, seems to contain a reference to sordid profits. If, however, the author, and others who talk in the same vein, wish to convey this meaning when they speak of the administration of American colleges as commercialized, they are certainly far afield; for no evidence, as far as I know, has been presented tending to show that presidents and trustees so administer as to make profits for themselves. Probably the author does not mean to include this particular implication of "commercial" when he speaks of college administration, though he does distinctly include it when he turns to apply the term to the student and his aims. As applied to the administration, "commercialized" probably means "desirous of doing big business"; but certainly a more precise characterization of American university administration is necessary before its excellencies can be intelligently strengthened or its vices corrected. As applied to the teaching force of our universities, the author's stock adjectives apparently mean neither that the professor is intent above all things on gain, nor that he is enamored of the ideal of great enterprises, but rather that the atmosphere of American life makes it impossible for him, or for any one, to enter upon any but commercial pursuits with entire seriousness and enthusiasm. Hence the professor, if naturally energetic, becomes a pedant, or, otherwise, a dilettante; in neither case can he be an inspiring teacher, or rise to true scholarship; in consequence of which the nation's achievements in pure science "have been insignificant." A third defect of the author's method appears in these superlatives and absolute statements, when comparative measures can alone represent the truth or afford a basis and incentive for advance. What we need is the facts, inductively determined, accurately formulated, and if possible put into such shape that quantitative comparisons may be possible between our own conditions and those in more advanced countries, and between our condition now and hitherto as well as hereafter. I have no doubt, however, that such a suggestion will appear to the author as simply one more illustration of that commercial tendency which forms the chief weakness of American education and scholarship—"a disposition to deal with facts and to neglect principles."

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COLUMBIA UNIVERSITY,
October 29, 1910

SCIENTIFIC BOOKS

The Laws of Heredity. By G. ARCHDALL REID, M.B., F.R.S.E. London, Methuen & Co. 1910.

Dr. Archdall Reid has already given us books and articles on heredity that are both interesting and instructive, and the present volume not only lives up to the standards set by its predecessors in these particulars, but surpasses them in the breadth of its scope, which is much greater than its title would seem to imply. For not only does the author give an exposition of the laws of heredity and abundantly criticize them, but he discusses at length their bearings, as he sees them, on such sociological questions as eugenics, intemperance, insanity and education, on such psychological problems as the relation of mind to

body, instinct, reason and memory, and withal takes occasion to present disquisitions on the method of science, on the relative values of induction and deduction, on idealism and common sense, and one chapter bears the Teufelsdröckhian heading "Necessary Truth."

The book is an output of the study and the author glories in that it is. Laboratory and statistical methods are in his opinion practically superfluous in the study of heredity; simple observation of patent facts and deduction alone are essential.

> Not seldom in biometric inquiries . . . several scores or hundreds of observers and thinkers are employed for years in ascertaining, with a much less degree of certainty, that which a single thinker may deduce in two minutes from known and admitted truths.
>
> If the reader will think over the evidence on which I shall draw for the purpose of the present volume, I believe he will conclude that, if any of it bears a doubtful aspect to his mind, it is that large mass which has been furnished by laboratory inquiry.

These quotations reveal Dr. Reid's attitude toward two popular methods of modern biological inquiry and, at the same time, they reveal his limitations as a critic. And an additional imperfection in his treatment of his subject is the failure to take sufficiently into account the known complexity of cell structure and the bearings of this on inheritance. For him the cell is the ultimate unit and even in these days of atom-splitting deductions we find in his philosophy no consideration of any lower structural or physiological units, no suggestion of the important bearings which our knowledge of the architecture of germ plasm may have on the subjects he discusses, and this because, in his opinion, the discussion of such matters would be merely "valueless guessing—valueless because incapable of being tested"! Why they can not be tested like any other theories or facts it is difficult to understand.

But in spite of these limitations, indeed, to some extent because of them, Dr. Reid has given us a book full of suggestive ideas. Indeed, so full is it of suggestions that it will be impossible here to do more than give a brief outline of some of his conclusions. What may be regarded as the basis of his argument is the idea that "Evolution is only another name for adaptation and in the last analysis all adaptation results from the natural selection of favourable variations." This is the Neo-Darwinian creed, but Dr. Reid adds to it the idea that it is not so much the evolution of definite characters that is the office of natural selection as it is the provision of possibilities for variation and the regulation of their magnitude. Growth is the result of stimuli, such as nutrition, injury and use, and natural selection has brought about such responses to these stimuli as place the organism in adaptation to its surroundings. Thus it is not a large muscle nor an elongated neck that is inherited, but the possibility of developing these peculiarities under the influence of the stimulus of nutrition or use. Inheritance of acquired characters does not occur, it is not the character that is inherited and no character is any more acquired or innate than another. A serious fallacy in the Lamarckian position, according to Dr. Reid, is that it demands that a structure enlarged under the stimulus of use, for example, should give in another generation a similar response to the altogether different stimulus of nutrition. For him the Lamarckian position is foolishness; "it is dead as an accepted interpretation of the facts."

To the question that underlies the development of possibilities of variation, the cause of variation, Dr. Reid gives no satisfactory answer or theory. What is inherited is the germ plasm, and variations in this may be produced either "spontaneously" or by the action of the environment, this meaning apparently the external environment. The latter cause is of little moment, since it can act only injuriously and can therefore have been of but rare occurrence in individuals that survive and reproduce. It is on "spontaneous" variations alone that natural selection acts and this spontaneous variability has itself been evolved under the action of natural selection. But how these "spontaneous" variations occur is not even hinted at and on this point we are

left where Darwin left us, without any clue to the manner in which natural selection is supplied with the material on which it may act.

The biogenetic law reappears in all its pristine vigor, indeed with added vigor, for it is held to be inconceivable that the phylogenetic recapitulation should not occur if it be granted that species arose by evolution and that the offspring recapitulates the parental development. Both progressive and retrogressive modifications of the recapitulation occur, and of these the retrogressive ones tend to be the greater either in frequency or magnitude or in both. Retrogressive modifications are omissions from the complete recapitulation and are therefore identical with reversions. The omission may, however, be merely apparent in some cases; an ancestral trait may appear to have been dropped when in reality it is merely latent, and hence the reappearance of a dormant ancestral trait is not a reversion. Regression in the Galtonian sense is merely the first stage of retrogression.

The object of sexual reproduction is not the production of variations, since these occur with parthenogenesis; its function is the blending of parental characters. Certain characters, however, are alternative and among these are sexual characters, using the term sexual in the widest sense. Thus every individual possesses three sets of characters, one set common to both sexes, that is to say, patent in both, and two sets of sexual characters, one of which is patent and the other latent, according to the sex of the individual. This same condition Dr. Reid finds in Mendelian inheritance, the dominant characters being patent ones and the recessive latent, and he carries the idea a step further in maintaining that instead of sexual characters being Mendelian, these latter characters are sexual, the Mendelian phenomena depending on their relative potency or latency, rather than on the presence or absence of definite determining factors. "Unit segregation, gametic purity and independent inheritance of characters (in the Mendelian sense) are all myths that have been founded on experiment, but have not been tested by it or in any other way"!

In discussing mutations, to which class of variations he assigns those characters that show Mendelian phenomena, Dr. Reid maintains that "In hardly a single instance has the crossing of natural varieties revealed a latent ancestral character," that is to say, a recessive parental character! But in domestic races this revelation is frequent and therefore natural and artificial selection are essentially unlike. Man in dealing with domestic races uses mutations, but nature uses fluctuating variations. Mutations occur in nature, but "never yet has a mutation been recorded—neither in man, nor in lower animals, nor in plants—that gave its possessors an advantage in the struggle for existence so overpowering that it enabled them to supplant the ancestral type."

In what has been said the attempt has been made to state concisely Dr. Reid's position with regard to the principal problems of inheritance, and the abstract corresponds to about two fifths of the book. The remainder is occupied with discussions of the sociological and psychological applications of the author's conclusions, and concerning these, interesting though they are, space remains but for an illustrative statement and a quotation. The author holds that disease, alcohol and narcotics are the only important selective factors in the case of the human species, and the only progressive evolution that human races undergo is that which tends to resistance to these factors. Acquired immunity or total abstinence will not lead to the development of that resistance, and, far from being for the good of the race, would, if effective, expose it eventually to disaster from the very causes it endeavored to avoid. A newly introduced disease if fatal, is always more so than one to which the community has been for some time exposed and to which it has, by natural selection, gained some resistance.

"In considering any practical problem we must first of all determine what we propose to improve—whether germinal potentialities or characters which developed under the stimulus of nutrition, or of use, or of injury—and then consider in what way they may best be im-

proved—whether by selection or by altering the stimulus, and if the latter, how the stimulus may best be altered." Would that all sociological reformers might read and ponder these words.

J. P. McM.

REPORT OF THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE[1]

During the Graz meeting of the International Zoological Congress, the International Commission on Zoological Nomenclature held five executive sessions and one public meeting.

The following ten commissioners were present: Blanchard (president), Dautzenberg, Hoyle, Jentink, Jordan, von Maehrenthal, Monticelli, Schulze, Stiles (secretary) and Wright.

The following five commissioners were not in attendance: von Graff, Joubin, Osborn, Stejneger and Studer.

Resignations.—The following commissioners have presented resignations, and the commission recommends that their resignations be accepted: von Graff and Osborn.

Expiration of Term of Service.—The term of service expires at the close of this congress for the following five members of the class of 1910: Blanchard, Joubin, Stiles, Studer, Wright.

Nominations.—The following members of the congress are nominated to fill vacancies on the commission, caused by resignation or by expiration of term of service:

Class of 1913: Hubert Ludwig (Bonn), *vice* von Graff (Graz) resigned. J. A. Allen (New York), *vice* Osborn (New York) resigned.

Class of 1919: *vice* class of 1910 (term expired): R. Blanchard (Paris), C. W. Stiles (Washington), Louis Dollo (Brussels), Ernest Hartert (Tring), G. A. Boulenger (London).

By-laws.—The commission has adopted the following by-laws, based chiefly upon the methods of procedure adopted at former meetings:

[1] This report was read once in the open meeting of the commission and again in the last general session of the congress. It was adopted by the congress.—C. W. S.

BY-LAWS OF THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

Article I. *Membership*

Sec. 1. This commission shall consist of fifteen members, elected by the International Zoological Congress.

Sec. 2. The commissioners shall serve in three classes of five commissioners each for nine years, so that one class of five commissioners shall retire at every international congress. The retiring commissioners may, however, be reelected to succeed themselves.

Sec. 3. In case of resignation or death of any commissioner, his place shall be filled for the unexpired term by the next international congress.

Article II. *Officers*

Sec. 1. The officers shall consist of a president and a secretary, elected by the commission from its members, to serve during their term as commissioners.

Sec. 2. The two officers shall form an executive committee, whose duty it shall be to perform such work as may from time to time be designated by the commission.

Article III. *Powers of the Commission*

Sec. 1. The commission shall have no legislative power but shall study the general subject of the theory and practise of zoological nomenclature, and shall report its recommendations to the triennial International Zoological Congress.

Sec. 2. The commission shall not report to any congress any proposition for amendment to the International Code, unless said proposition has been before the commission for at least one year prior to the meeting of said congress.

Sec. 3. The commission is authorized to express opinions on cases of nomenclature submitted to it.

Article IV. *Reports to the Congress*

Sec. 1. The commission shall make a report to each triennial International Zoological Congress. Said report shall consist of the following:

(*a*) Recommendations involving any alteration of the Regles Internationales de la Nomenclature Zoologique, but no such opinion is to be reported unless it has first received a majority (eight votes) of the commission and the unanimous vote of all commissioners present at the meeting.

(*b*) All opinions which have been rendered since the preceding congress.

(*c*) A list of all commissioners whose term of