helpful to the student. We take pleasure in commending the work to nature lovers, and particularly to the large and healthful class of of out-door students of birds.

C. H. M.

The Present Evolution of Man. By G. ARCHDALL REID. London, Chapman and Hall. 1896. pp. 370.

The work which has appeared with the above title consists in fact of two parts; up to p. 196 it has reference to organic evolution in general, and only the remaining portion, pp. 197–370, treats especially of the evolution of man. In the earlier part of the work there is given a very excellent discussion of the broad principles of evolution, and particularly of the reasons which lead to the conclusion that acquired characters are not inherited by other than the lowest organisms. The argument against the transmission of acquired characters, as ordinarily understood, appears to the writer conclusive, and he would commend it to the neo-Lamarckians for dissection. It is also well shown that under ordinary circumstances natural selection works upon normal variations, and not upon those which occur only at infrequent intervals. Much stress is also laid, very justly, upon the importance of characters which are normally acquired, and of the power of acquiring them.

An interesting argument runs as follows: Inasmuch as progressive or new variations may be in all directions, but atavistic variations are in one direction—towards the ancestry—there will be a tendency, in the long run, *in the absence of selection*, to revert to a more primitive condition, owing to the dominance of the atavistic variations. When the evolution has been very slow, as with certain Brachiopoda, the reversion will be scarcely noticeable, but when it has been very rapid, as with many domesticated animals, the reversion will be rapid and striking. All this appears to accord with the known facts, but to the present writer it seems an inadequate statement of the actual course of events. Mr. Reid says: "In every species natural selection as a cause of evolution, and atavism as a cause of retrogression, are constantly at war." It does not seem to me that this is necessarily the case, but that, on the other hand, atavistic variations may be themselves selected. The germ, it must be supposed, contains units representing many phases of existence, some of which have been held over, undeveloped, through many generations, while others are new. When one of the latter develops we say the variation is a progressive one; when the former develop we call the result atavism. It is reasonable to suppose that environmental and germinal selection are the factors which determine which of its possible developments the germ shall undergo. That is to say, there are two factors involved, one the relative vitality or growth-force of the several germinal elements, the other the environment favoring one or the other in their struggle This same struggle, in various phases, goes on through life; for example, many people have two or more talents, which cannot be fully exercised simultaneously; other things being equal, the strongest will prevail, but how often the environment steps in and dictates which of the possible paths of life shall be followed.

This being made clear, it is evident that atavism increases the range of possibilities of any given germ, and thus may be highly advantageous. Especially is this the case when the environment is changeable, as with seasonally dimorphic butterflies, one phase of which is probably in most cases older than the other. My own studies of bees have led me to believe that many of the specific characters had their origin in atavistic variations, because it often happens that a character will appear in two different groups independently, and yet be so striking and definite as to suggest that it must have existed in a common ancestor, though not in the immediate ones.

How, then, as to atavism in the absence of selection? It is perfectly obvious that any given adult individual does not, under existing circumstances, represent the average potential, if one may so express it, of its race. In the first place, the individual is probably a survivor out of many—has been the subject of natural selection. In the second, it represents only one (selected) phase of the many that were possible to the germ. In the total absence of selection (an impossible thing) we should obviously

get the actual mean, or a series of individuals symmetrically arranged around that mean. This would involve more or less atavism; because the potentialties of the germs are derived from past generations, and include many repetitions, more or less complete, of phases which have lately, owing to the incidence of selection, been permitted no development. But I cannot see, with Mr. Reid, that there would be unlimited atavism, because when the atavistic changes had proceeded from B to A, the B-features would become ancestral, and a new atavism, from A to B, would appear. Thus at some point there would be reached a condition of equilibrium, and the tendency to vary in any particular direction would be lost. Existing species may be compared to elastic bodies under stress, the stress being natural selection. When the stress ceases, there is contraction until the condition of equilibrium is reached, but certainly not indefinite contraction.

The second portion of the book consists of a discussion of human evolution against zymotic diseases and narcotics. Mr. Reid argues that the way to tell in what direction the evolution of a species is tending is to observe the causes of mortality. Applying this test to man, he concludes that as disease is the principal cause of death it must be against disease that we are evolving. He then proceeds to show that those races which have long been subjected to a particular disease, *e. g.*, malaria or consumption, have acquired a relative immunity from it, or at least a power of enduring its attacks. The whole matter is set forth very clearly and is well worth reading. While it cannot be denied that the factor of zymotic disease is an extremely important one, hitherto generally overlooked in discussions on human evolution, I must say that I think Mr. Reid himself has overlooked some not less important factors. The 'social efficiency' of a people, as Mr. B. Kidd rightly insisted, is a factor of immense importance. Thus, in this very matter of zymotic diseases, how greatly is the death rate in an epidemic (and the existence of the epidemic itself) influenced by the social condition of the people, and even by their intellectual and moral condition, as reflected in the municipal government and sanitary arrangements! Thus, while, as Mr. Reid shows, the negro is under identical conditions far less affected by malaria than white people, Dr. J. S. Billings has to report, in summing up the statistics for 28 cities of the United States, that the deaths from malarial fever were more than three times as numerons, in proportion to the population, among the colored people as among the whites. It is fair to state that under the term 'colored' he includes the Chinese, etc., but the difference is conspicuous in those cities which are known to contain a large negro population. Mr. Reid may reply that sanitary arrangements and forms of government, affecting all, select nobody; but certainly they do select the citizens of one town, State or country as against others, or those of the rural districts as against the towns. Thus the population of large cities, like London, is perpetually replenished from the rural districts. A pure-bred cockney of the fourth generation is said by J. M. Fothergill to be very rare. Further, as Dr. Billings has shown (11th Census of the United States) the death-rate in every large city varies enormously in the different wards, and this must be due mainly to the mode of life of the people, their food, sanitation, and other matters directly connected with social efficiency. Still again, there is a tremendous proportion of infant mortality, a large part of which must be due to unfavorable conditions of the mother or child. Thus it must necessarily be that, while there are inequalities in morality and intelligence, the most moral and the most intelligent races or groups of people will be favorably selected in the struggle for existence.

The whole subject is one of immense complexity, and in studying the statistics one has to be constantly on the lookout for sources of error, which are numerous and confusing. But there is no doubt that Mr. Reid's discussion is a valuable one, if only it draws attention to matters which have been too much overlooked.

The final portion of the book, treating of evolution, against alcohol and other narcotics, seems to me to contain a fundamental error. It is assumed that a desire for alcohol is inherent in the human race, and that, since the substance cannot be banished, our only salvation is to gradually acquire a toleration of it, as of a

zymotic disease. It is shown that certain races are on the way to acquire such toleration, and in the presence of alcohol suffer much less than others. An obvious difficulty here is to explain how, under the influence of natural selection, this highly pernicious craving for alcohol arose. Mr. Reid says: "It can have arisen only as a bye-product of mental evolution, a bye-product which, in the absence of narcotics, was harmless, but which in the presence of them is harmful." This surely is a very far-fetched supposition, since it is implied that the craving for alcohol developed in the absence of that substance! To the present writer it appears evident that the human race has no natural craving for alcohol at all, but it has a craving for excitement and other states of mind which may be induced artificially, and that when the natural exercise of highly valuable faculties is denied, as is so often the case in our present civilization, artificial means, often highly injurious, will be resorted to. It will apparently sometimes happen that when an artificial stimulus is persisted in for a long while, and is not in itself injurious, it will become a necessity, just as clothes have become necessary to a large portion of mankind. As an instance of this, we may cite the use of hot flavoring substances (as pepper) by inhabitants of warm countries to promote digestion. It is conceivable also that a race might acquire considerable toleration of alcohol, and at the same time lose the power of acting efficiently except under its influence, so that a member of the race, separated from his bottle, would be powerless! But it is perhaps more likely that the process would be just that which Mr. Reid describes as inevitable, namely, that the desire for alcoholic stimulation would be lost, while at the same time the effects of drinking a given quantity of alcohol would become less. This is regarded by Mr. Reid as very desirable, but what if it means the destruction of a valuable faculty, which, rightly exercised, might have been once more, as originally, of great importance to the race? Put it in this way: The wretched laborer of a crowded city, overworked and underfed, desires to escape from his environment—desires, if only for a brief period, to be free. Alcohol gives him a temporary means of escape, but at a frightful cost. It is deplorable that he should seek it, but how much more deplorable it would be if he should cease to care—if he should become degraded to a mere machine, accepting without thought the suppression of three-fourths of his natural activities? Surely the remedy is not, as Mr. Reid supposes, to eliminate those who wish to drink, but to find the means of living full and active lives, in the natural exercise of all our functions.

T. D. A. COCKERELL.

MESILLA, N. M., June 8, 1897.

SOCIETIES AND ACADEMIES.

MEETING OF THE NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY.

THE New York Section of the American Chemical Society held its June meeting on the 11th inst., preceded by a dinner, at which thirty members participated, including the President of the General Society, Dr. C. B. Dudley. The meeting was called to order in the chemical lecture room of the College of the City of New York, at 8:30, by the chairman, Dr. William McMurtrie, who then invited Dr. Dudley to preside.

The death of Professor C. R. Fresenius at Wiesbaden was announced, and the Secretary was authorized to cable the regrets and condolence of the Society to his sons. An obituary notice of Dr. Carl H. Schultz was read by Dr. A. P. Hallock, after which the papers of the evening were read as follows:

F. S. Hyde, 'Comparative Tests for Identification of Some Medicinal Carbon Compounds.' E. G. Love, 'Note on Analysis of Cheese.' Benj. C. Greenbergh, 'Determination of Dextrine in Presence of Sugars.' Gustav Volckening, 'Novel Mechanical Arrangement of Fat Extraction Apparatus.' L. Reuter, 'Demonstration of Some Chloroform Compounds and of Some of Baumann's Thioaldehydes.' W. E. Chamberlin, 'Calibration of Volumetric Apparatus.' C. A. Doremus, 'Method of Collecting and Analyzing Gases contained in Canned Goods.'

It was stated by the chair that forty papers had been presented before the Section during the winter, a number considerably in excess of