

THE LATEST WORDS OF SCIENCE ON DARWIN'S THEORY

How Darwin's Theory of Natural Selection Has Now Not a Single Fact to Confirm It in Nature

BY FATHER EDWIN V. O'HARA.
It frequently happens after a theory has been declared by contending powers that outlying bands who have not kept in touch with the base of operations prolong the conflict with unabated acrimony in a series of guerrilla skirmishes. An analogous event occurs in the wide field of speculative controversy when, in the present state of science, the theory of natural selection is made an occasion for dispute.

To understand the change which has come over scientific speculation since Hugo de Vries, in 1901, published his epoch-making work, entitled "Die Mutationstheorie," one must at the outset get clearly in mind the problems involved in the scientific theory of organic evolution. The man of science, on passing in review the myriad forms of living organisms, is forcibly struck by two sets of facts. In the first place, he observes the wonderful structural dissimilarities which distinguish the various species; then, on the other hand, he notices the no less remarkable structural similarities between certain species which for that very reason he classifies in the same group. As a result of this dual observation, the man of science has formulated the simplest explanation of these resemblances in the form of the hypothesis that these species are genetically related, i. e., that they derive their descent from a common

parent species. This theory is concerned with the relation of systematic species, genera and families. It is opposed to the theory of the constancy of species, and has proved most valuable as a working hypothesis. As yet the evidence for it is inferential, rather than direct. Only in a few instances has the origin of new species been directly observed, and then only in closely allied forms. The botanist, Dr. Vries, however, has witnessed the origin of new species of the evening primrose, and Father Wasmann, the veteran zoologist, has observed the origin of a new species in the beetle genus *Dinarda*. The observations of these scientists will be of importance when we come to consider the "mutation-theory."

It is an easy task to find indirect evidence of the genetic relation of many organic species to each other, and to forms represented by fossil remains. We may instance here the various species of the horse family, and the ammonite group. Similar conclusions may be drawn from a study of various insects, especially of those which live as "parasites" with ants and termites and adapt themselves to many ways to their hosts. The theory of descent does not require that all species of plants and animals be derived from a single original form. The paleontologist, Professor Steinmann, in his inaugural address as rector of the University of Freiburg, in Breisgau, pointed out that the world of science indicates that evolution has been polyphyletic, that is, there have been a number of independent genetic series in the process.

Such is the theory of descent which, thanks to Darwin, is regarded with practical unanimity by all men of science as the simplest explanation of the structural similarity of species within the same group. Now, admitting that the resemblances are to be accounted for by a genetic relation, the scientist is confronted with the problem of explaining the striking point of contrast. If the species of each group are descended from a common source, how account for their divergence from their common type? In answer to this question two solutions have been proposed, namely, the theory of natural selection and the theory of mutation. To find out precisely which theory is sustained by natural selection, we should turn to his great work, "The Origin of Species by Means of Natural Selection." In the third chapter of this work he observed that small "fortuitous" variations in individual organisms, though of small interest to the systematist are of supreme importance to his theory since they are the raw material of natural selection. The possessor of them some advantage over his fellows in the quest for the necessities of life and thus in the struggle for existence. The "fittest" survive, and toward slight varieties, which in turn, lead to sub-species and finally to species.

This principle by which each slight variation, if useful, is preserved, Darwin denominated "natural selection." This hypothesis was confessedly unsupported by scientific evidence; indeed, by its very postulate of unlimited time for the transmission of species, it was beyond the grasp of the experimental demonstration. Still, the hypothesis provided such a simple and, at first blush, so plausible an explanation of the structural similarity of related species that it soon gained very general acceptance. During the last quarter of the nineteenth century, however, the selection theory was found to be incompatible with the facts. The history of the Ptolemaic theory of the circular motion of planets was repeated in the case of the selection theory. The motion of various planets would not conform to the circular motion prescribed by the theory, they resorted to other hypotheses. In the case of the selection theory, the scientists became a majority of all factors, not merely associated with the defense of each factor.

Attention was called to this "remarkable" turn of events by the scientific questioner by Oscar Hertwig, Director of the Anatomical and Biological Institute of the University of Berlin, in an address on the "Progress of Science During the Nineteenth Century," presented on September 17, 1900, before the Congress of Scientists assembled at Aix-la-Chapelle. "Darwinist, anti-Darwinist," as the author of the address, Haeckellian, and Weismannist, were denominated.

It was not until 1903 that the Kepler of Biological Science appeared in the person of Hugo de Vries to sweep away the selection theory with all its subsidiary factors. In that year the celebrated Dutch botanist proposed to the scientific world the "mutation" theory. Reserving for another article a full consideration of the mutation theory and the reception it has met at the hands of men of science, we will content this paper with a brief presentation of the reasons which caused the rejection of the selection theory.

Apart from the fact that naturalists could discover no evidence of a struggle for existence of such a sanguinary nature as the selection theory postulated, there were three classes of recognized facts to which the theory stood in irreconcilable opposition. In the first place, the fossil record, as far as it goes, is in regard to each of these, Morgan was forced to abandon the selection hypothesis as a hopelessly inadequate.

Professor Thomson, in his work, "Evolution and Adaptation," he passes in review the various kinds of adaptation which are to be seen in the animal and vegetable kingdom, mutual adaptation of colonial forms, protective coloration (once the boast of the selection theory), organs of extreme length, and other instances. In regard to each of these, Morgan was forced to abandon the selection hypothesis as a hopelessly inadequate.

The second series of facts relate to the history of organic development. It has been pointed out repeatedly by foremost men of science that if species originated by the accumulation of minute variations, there must have been a long period of time in which the species were in a state of nature displays itself in very different degrees. But the evidence which has accumulated during the past 40 years has led to the conclusion that there is a limit to specific variability which neither time nor skill avail to remove. All investigation and observation make it clear that the variability of creatures in a state of nature displays itself in very different degrees. But the evidence which has accumulated during the past 40 years has led to the conclusion that there is a limit to specific variability which neither time nor skill avail to remove.

The third count against the theory of selection concerns the possibility of building up new species by the accumulation of minute individual variations. It has been the wont of the advocates of this theory to base their speculations on the assumption that "an inconceivably long period of time" could effect almost anything in the matter of specific transformations. But the evidence which has accumulated during the past 40 years has led to the conclusion that there is a limit to specific variability which neither time nor skill avail to remove.

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TEMPERANCE REFORM THAT BEARLY REFORMS

APPENDED hereto is an article which recently appeared in the Scottish Review. It forms an interesting contribution to the question of regulation of the liquor traffic, a question which has been for some time and still is of much importance in this state; and I trust that you will be so good as to give it a place in your columns, as it will doubtless be widely read with interest.

JOHN BAIN.
THE Scottish Temperance Legislation Board may congratulate itself on the success of its commissioners in Norway this Summer. The interim report of their investigations has now been published, and deserves close attention, for, in the words of the commissioners:

"Within the past half-century Norway has been transformed from one of the most drunken of European nations into one of the most sober. Apart from the general advance in education, the result is due to two main causes: (a) The growth of a strong temperance sentiment, which, having been present in all sections of the community, is most powerful in its earnestness

and intensity among the working classes. (b) Progressive temperance legislation, under which the people are invested with powers of local control, with considerable latitude in the selection of one of two systems of sparsely populated country districts have the power of local veto, while the towns have, in addition, the option of 'management' by disinterested companies known as Samlags.

"The effectiveness of each of these two factors in sobriety depends upon its co-operation with the other. The temperance movement would have been largely ineffective had it not been supported and aided by wise legislation; and, conversely, the power conferred by such legislation would have remained unused but for the driving force of an ever-growing temperance sentiment, arising from being antagonistic forces, they aid each other. The force of temperance opinion keeps the Samlags up to a high level of efficiency, and the Samlags stand as a bulwark against reaction, in the event of a too stringent application of the law.

"Such is the statement of the commissioners. Those who know Norway know that it is true. The sobriety of the Norwegian towns has repeatedly impressed foreigners visiting in them, even for a short time. It is a triumph of the temperance cause.

"The labor unions of the country should be admitted to membership. The unions are a recognized power, and they can become a great moral force if they will take issue against the liquor traffic. The unions should be something more than mere machines to keep wages at a certain rate. They should be fraternal organizations, caring for the moral as well as the pecuniary welfare of their members. As they are instituted for mutual protection against capital, so should they be organized for the moral as well as the pecuniary welfare of their members. As they are instituted for mutual protection against capital, so should they be organized for the moral as well as the pecuniary welfare of their members.

"Count the cost right here in Portland, where an army of policemen are required because of the saloons. Count the cost of the city, trial by court, the pay of officials, jurors, etc., count all the costs and then see how much profit is derived from the saloons. Now, suppose the laboring people of Portland put their earnings in the savings banks instead of into the saloons. Where would the saloon be? Every Monday morning the saloon men take bags of dollars to the banks given them by the laborers and mechanics. Now, why not be your own depositors, fellow laborers? Do not take the money to the banks yourselves, instead of allowing the saloon man to deposit the money you have earned?

"If the laboring people of Portland would do this, they could, in a short time, build and equip a line of steamers for the coast trade. They could establish manufacturing plants, build a great workingmen's hotel, run a big co-operative farm or a mammoth department store. There is not a laboring man in Portland who could not own his own home, if he would put his money in the bank instead of the saloon.

"These are facts. The saloon-keeper plies his avocation because there is money in it—more money and easier money than he can make at anything else. He is in the traffic because the officials—not the law—allows him to be in it. And it is up to the laboring people, who patronize and are cursed by the saloon, to quit it.

"The laboring people are the salt of the earth. Labor produces all that is profitable in the world. It is the laboring people who build the great structures of the world; all the agricultural and other machinery of the universe; all the ships which sail the waters; all the great network of railroads with their thousands of locomotives and cars, are the result of labor. Without labor none of these things could be built, and the creator of all wealth of whatever kind.

unphant vindication of the principle of local option, which in Norway includes (a) Samlag management, (b) spirit prohibition. In the thinly-peopled country districts the epoch-making law of 1845 is still in force. Under it all houses for the retail sale of brandy (the spirit or brandy) are prohibited unless specially sanctioned by the local governing body. The results appear to be satisfactory. No one thinks of making any change.

"But Norwegian prohibition must not be confounded with prohibition as prevailing in Maine and in other American states, and as advocated in Great Britain. In Norway prohibition does not extend to beer and wine. "Interim Report on the Liquor Licensing Laws of Norway."

"The law of Norway, which authorized the formation of these disinterested companies in towns, introduced into the licensing system certain important changes, which may be summarized in the following points: (a) The elimination of private profit; (b) the reduction of the number of licenses; (c) the easy enforcement of the law; (d) the destruction of the power of the spirit trade; (e) the furtherance of all progressive measures of reform."

"The towns, under the act of 1884, have the dual option mentioned above. Every six years, if one-twentieth part of the electors (all men and women over 25 years of age) demand a poll, a vote is taken on the management—prohibition or license. A majority of all electors, in the case of voting, is required to effect any change. Those not voting are held to be in favor of the status quo. No poll is made for a revision of the license law. When the local option law was passed (1884) there was a Samlag in nearly every town in Norway. By the operation of the local option law, 57 of these towns are now under prohibition, and 31 under Samlag management. The Samlag system is confined to the larger towns. Seven were for a time under prohibition, but have since returned to the Samlag system.

"The directors receive a small honorarium for their services, and the rate of interest on shareholders' capital is 5 per cent. No difficulty is experienced in inducing prominent and reliable men to act as directors."

"The profits of the Samlags are applied thus: (a) To the state, originally 25 per cent, now to 65 per cent; (b) to the municipality, in lieu of larger license duties now abolished, 15 per cent; (c) to objects of public utility, not being chargeable on any rates, but operating counter-attractions to the public-house, in towns 10 per cent, in surrounding country districts 10 per cent—20 per cent. (Originally this 20 per cent went exclusively to the municipal expenses, but under the act of 1904 it is allotted to adjoining rural districts.) Total, 100 per cent."

"The report proceeds: 'A deep impression is made on our minds by the emphatic declarations made by Norwegianians of all classes in favor of the Samlag management system. The unhesitating approval of the system by statesmen, clergymen, physicians, town Councilors, police authorities, the press, and all other well-to-do classes, and the fact that the Samlag system was more significant than this was the agreement among 'Totalists' and Prohibitionists, and the fact that the Samlag system is a step towards their own ideal.

"As a ready means of eliciting opinion, we made it an invariable rule to state fully to our informants various arguments against any form of 'management.' We argued that 'the profits of drink management demoralize and corrupt the community, and make it indifferent to restrictions.' The undoubted force of the argument was freely admitted, but it was pointed out that under the act of 1904 the profits of the traffic were properly applied. The Swedish method of using the profits to reduce the rates was admitted to be a mistake, and now beginning to rectify; but the Norwegian plan of handing over two-thirds of the profits to the central government, and the remainder to the rate-aided local objects was everywhere held to be free from danger.

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"We argued further that 'the public house would be made more respectable, and the prestige of the traffic enhanced, and drinking thereby increased, especially among the young, if the bars were managed by prominent citizens.' It seems that this danger was at one time dreaded by Norwegian 'totalists,' but we found it impossible to persuade any one to listen seriously.

"They had had 30 years' experience of the business, they said, and the danger did not exist. Indeed, the marked reduction of the state of affairs suggested by the argument and the actual results of the strict Samlag discipline invariably raised a smile.

"A third argument which we brought forward was that 'with company management the introduction of reforms would be hindered,' and especially that 'the total abolition of the traffic would be seriously delayed.' Most emphatically were we told by all our 'Totalist' informants that this fear was groundless; that every reform was in progress; that the Samlag had a strong educative influence; and that with its aid public opinion had advanced in some towns to the point of the prohibition of retail trading in spirits. Many minor changes had been quietly introduced by the managers of the Samlags—later opening hours, the reduction of alcoholic strength, and the prevention of treating by restricting the number of drinks. Had an attempt been made to impose such changes on the privately owned trade the attempt would have failed.

"Several prominent men whom we met held the opinion that the strict regulation of the Samlags tended to encourage drinking in clubs and at home, a danger more acutely felt the nearer the approach to prohibition. In this respect they regarded the Samlag, with its adjustment to local conditions, as a useful and sensitive gauge of public opinion, and a most valuable aid to public morality."

of prisoners to the city, trial by court, the pay of officials, jurors, etc., count all the costs and then see how much profit is derived from the saloons. Now, suppose the laboring people of Portland put their earnings in the savings banks instead of into the saloons. Where would the saloon be? Every Monday morning the saloon men take bags of dollars to the banks given them by the laborers and mechanics. Now, why not be your own depositors, fellow laborers? Do not take the money to the banks yourselves, instead of allowing the saloon man to deposit the money you have earned?

"If the laboring people of Portland would do this, they could, in a short time, build and equip a line of steamers for the coast trade. They could establish manufacturing plants, build a great workingmen's hotel, run a big co-operative farm or a mammoth department store. There is not a laboring man in Portland who could not own his own home, if he would put his money in the bank instead of the saloon.