

# A FRENCH SCIENTIST OF THE SORBONNE ATTACKS DARWINISM

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**E**VEN candid individuals must admit that the tests to which the Darwinian theory is nowadays being subjected have produced a degree of well-founded skepticism.

Darwinism is the victim of two classes: its sincere critics and its extravagant disciples. It is another case of the Jehovah of Genesis being submitted to the test of Modernism and of Evangelicalism.

The idea of evolution pervades all contemporary thought, and if Darwinism, upon which it is based, should turn out to be of no more value than the imaginative hypothesis of Bernardin de Saint-Pierre the result would certainly be startling. This is the proposition set forth in Prof. Gaston Bonnier's "Pour et Contre le Darwinisme," which has fallen like a thunderbolt upon the easy going, tranquil, scientific world of Europe.

Certainly M. Bonnier casts no doubt on the idea of evolution per se for he writes:

"To-day all biologists admit that all species have changed in the past, are changing now, and will continue to change in the future. The scientific ideas based on fixed forms among living creatures, whether studied through fossils, cellular structure or embryology, eliminate every hypothesis except that which presupposes change."

But science does not agree about the methods of change or why the change occurs. Two doctrines clash, that of Darwin and that of Lamarck. Lamarck, says M. Bonnier, was a true naturalist who dared to oppose his theories to the botanists of the early part of the nineteenth century. He appeared before his time, and has, hence, been misunderstood and ridiculed. Darwin, on the other hand, declares M. Bonnier, was a savant, an original philosopher, and a shrewd but superficial observer of surprising ingenuity.

In other words, M. Bonnier ascribes to both Lamarck and Darwin the attributes which they would have been first to deny. Lamarck believed that he was a philosophical zoologist; Darwin, that he was simply and solely a naturalist. "I am just an observer," he writes again and again.

Still, Gaston Bonnier calls him a superficial observer: "First of all, he was a persuader. Even where his statements lack precision there is an inexpressible pleasure in reading him. His work was done at a time when naturalists had grown weary of piling up facts without tracing their mutual relationship. They welcomed his 'Origin of Species' enthusiastically. It stimulated them, gave zeal to their investigations, and then—both his disciples and his adversaries went beyond him."

Plainly, M. Bonnier sets out to glorify Lamarck at the expense of Darwin. Everybody knows what Darwinism is; but what is Lamarckism? M. Bonnier tells us:

"It is founded upon the idea that surroundings react upon the form and constitution of animal and vegetable life. If the environment of an animal or plant change in a continuous manner, the vital organs of the living subject are similarly changed from generation to generation so as to adapt themselves to the new environment. For example, a change of climate makes a dry country more or

less wet, and marshes and ponds are formed there. Thus, its animals and plants have an aquatic existence forced upon them. The carnivores, good at running, will take to swimming. Through successive generations they will more and more adapt themselves to the water. Some will develop web feet; others flippers."

There you have Lamarckism evolved long before Darwin spoke of the warfare among animals and plants and the survival of the fittest. Darwin had read Malthus, declares M. Bonnier; from him he took his idea of "the struggle for existence," and made a striking picture of it, thus:

"The living world is not a harmonious world, either in its forms or its functions. It does not exist for a definite end. Animals and plants are not organized for the purpose of serving man. Nature is a pandemonium in which every living thing fights for existence at the expense of others. There is everywhere the destruction of the weak, the triumph of the strong. Nature is an active composition whose life is perpetuated by the survival of the fittest."

"Now," pursues M. Bonnier, "the disciples of Darwin have concluded from this principle of the survival of the fittest that nature is in a constant state of progress to the advantage of the creatures that are most complicated in their structure and most differentiative in their form. Haeckel even made genealogical trees in which animals and plants were regularly derived one from another, the simpler forms being succeeded by the more complex."

But it must not be forgotten that to the principle of the survival of the fittest Darwin added another—the principle of natural selection—which M. Bonnier sums up as follows:

"Not all the descendants of the same parents are alike. Those that differ the most have different ways of life; they have, therefore, more chance of surviving than the others, which, being too much alike, struggle for existence among themselves."

This, M. Bonnier points out, is Darwin's weak point: If the descendants of the same parents are not alike, then what becomes of atavism, which plays so important a rôle in the Darwinian philosophy? And what are these descendants of the same parents who are so much alike? Darwin calls them "accidents," but that explains nothing, not even when he proceeds to differentiate between the "unhappy" accidents which perish and the "happy" accidents which survive. We fail to comprehend these accidents.

M. Bonnier gives a few Darwinian examples of this principle of natural selection:

"From a pair of omnivorous birds, eating both insects and seeds, a numerous progeny arrives. These differ among themselves. As the process of change continues, successive broods show birds more adapted in beak and crop to live on insect life; others are better suited for plant life. When this distinction becomes rooted the vegetarian birds no longer struggle for life against their brothers and sisters which have become insectivorous. So the extreme types have the best possible chance for surviving."

In this demonstration, however, M. Bonnier lets Darwin down easy. The Dar-

## Gaston Bonnier Declares that the Great English Naturalist Was Imaginative and Careless In His Observations.

winian story of the common ancestry of the giraffe and the leopard would hardly be less amusing than the imaginary digressions of Bernardin!

Let us now leave M. Bonnier's exposition of Darwinism and come to his criticism of Darwinism.

Darwinism, as has been pointed out, rests on two principles: the struggle for existence and natural selection. Herbert Spencer was the first to remark that very slight differences could not be effectual in selection. But it is these slight differences that Darwinism calls the origin of species. A "happy accident" occurs. Hornless ruminants suddenly produce a type with "little protuberances"—the origin of horns. Of course, horns being good to fight with give the type which bears them a superiority, which bears out the theory for the survival of the fittest; but Darwinism breaks down on the fact that the original "little protuberances" had no such value.

Darwin himself was aware of this, for before he died he came to realize that the principle of natural selection did not jibe with the principle of the survival of the fittest. He firmly believed, however, that

even though his hypothesis collapsed his experiments and observations would still stand and be used by others who might thereby arrive at the truth. But M. Bonnier declares that they are not destined to stand for the simple reason that "the illustrious naturalist had no idea of the experimental method."

M. Bonnier cites several of Darwin's experiments to prove this: "Three hundred pages of Darwin's volume on 'carnivorous' plants are devoted to sundew, which grows in marshy places. The plant is made up of a slender, upright stem bearing little white flowers; at its base there is a rosette of reddish leaves with curious hairs on their upper sides. Each hair ends in a little bowl which glistens in the sunshine like a drop of dew."

Darwin seeks to make out that this plant is carnivorous, freely digesting insects and even morsels of meat. Now, although it is perfectly true that little insects placed on the leaf are crushed by the automatic folding of the leaf, all this does not prove that the plant digests the insects thus caught. In fact, the plant has good roots working like other roots. Its leaves, like those of other plants, ab-

sorb carbonic acid gas from the atmosphere. The plant does not die if it be deprived of its insects or "morsels of meat," but it does die if it be prevented from breathing carbonic acid gas. On this point M. Bonnier writes:

"An exhaustive study of the illustrious naturalist's work reveals absolutely nothing to back up his assertion beyond the lines that follow: 'Water was poured over the sundew's leaves and the liquid sent to Prof. Franckland. Prof. Franckland and his assistants made the important observation that this liquid was subjected to the sulphuric acid test, when it gave off an odor resembling that of pepsin.'"

M. Bonnier rightly inquires whether the substance was later analyzed, chemically and physiologically, and whether it was thereby proved to have digestive properties. No! Nothing but the odor of pepsin! And so he concludes: "You must admit that this is a curious way of demonstrating the identity of the liquid and pepsin."

Further, in order to show the digestive properties of sundew leaves, Darwin writes:

"I don't know whether a real analogy is established by the following fact, but it is not the less worthy of remark that a decoction of cabbage leaves is much more irritating, and probably much more nutritive to the sundew than an infusion made with warm water; now, at least in the case of man, it is known that boiled cabbage leaves make a much more nutritive food than raw leaves."

"This is hardly the tone of a scientific document," adds Gaston Bonnier.

Now, we come to the experiment of Darwin on the fly-catching dionaea. At the end of a leaf he placed a bit of rare roast beef; at the other a bit of gelatine. "The leaf fed itself spontaneously after eleven days. On the inside I found a trace of the meat; the surface of the leaf was blackened where the meat had been. The gelatine had entirely disappeared."

Darwin next placed a tiny bit of cheese on the sundew's leaf and after eleven days the cheese was still there, and hence, the great naturalist concludes that the sundew likes roast beef and gelatine, but detests cheese.

On this point M. Bonnier is merciless, but just. Place on a table, he says, a piece of meat, a piece of gelatine, and a bit of cheese, of the same size that Darwin placed upon the sundew leaf. Wait eleven days. At the end of that time the gelatine will have disappeared, the piece of meat will have left a dark stain, and the cheese would have pulled through all right—provided there be no mice in the vicinity. Ergo; tables like meat and gelatine and detest cheese.

M. Bonnier—and he is not alone among scientists—doubts the "carnivory" of certain plants. He writes:

"If you investigate the sundew's hair, you will see that the leaves often grip particles of sand, blades of grass, and various things besides insects, and that when a leaf has several times performed these slow movements, it seems to be exhausted and detaches itself and falls from the plant. Then, how in the world could it help the plant to digest insects?"

Darwin was greatly interested in the relation between flowers and the insects that visit them. His ideas on this subject may be summed up as follows, according to Sir John Lubbock:

"Not only have the form and present colors, the brilliant hues, the sweet odor and the honey of flowers been developed by unconscious selection exercised by insects, but even the arrangement of the colors, the circular bands, the radiating lines, the form, size, and position of the petals, and the relative position of stamens and pistil over all established in view of the insects' visits and so as to assure the great objects these visits are destined to effect."

Now, according to M. Bonnier, the developments of this theory are fanciful, for "cross-pollentization" does not benefit the plant, and from this point of departure the author of "For and Against Darwinism" proceeds to criticize the author's style. Darwin, he says, declares that the size and shape of the flower's organs are "always calculated so that the insect (and often an insect of a given species) will be obliged, when seeking honey, to give his body a certain definite position." Flowers make themselves beautiful "so as" to please bees and butterflies; they shed perfume "so as"

to attract these visitors; they provide honey "so as" to reward them. If a flower has a corolla too long for a bee to penetrate it is "in order that" only butterflies can do so.

Is it not astonishing to find Darwin employing phrases so much like those of Bernardin de Saint-Pierre? The resemblance is not superficial, for, like Bernardin, he traces everything to blind causes. He sees the effect, or thinks he does, and his imagination establishes the cause. Thus the "so as," "in order that," and the "happy accidents" come to form Darwin's logic as well as his basic idea."

M. Bonnier then reverts to the Darwinian phrase, "I am just an observer." But how good an observer is he? His theory of flowers and pollenization reposes wholly in the fact that insects pass from flower to flower and carry pollen from one to another. Darwin writes:

"For twenty years I have observed orchids, and with the exception of two butterflies I have never seen an insect visit an orchid."

To which M. Bonnier replies: "This is absolutely incredible, for the merest tyro who takes a walk in a French or English park or meadow in the Springtime can see bees and other honey bearing insects visiting the blossoms of these plants."

Darwin once made a visit to the Island of San Lorenzo. At a height of seventy-five feet he discovered cockle shells identical with those on the seashore. Among those cockle shells he found bits of cotton thread, tissue paper, bits of reeds, and corneob. And so M. Bonnier concludes:

"No time was wasted by Darwin. He did not bother to investigate. He came, he saw, he decided, and his decision attracted the attention of the scientific world! As the objects mentioned were found on the first three successive rises of land, he deduced that the cockle shells had been washed ashore and that since the coming of man in America the earth had risen above the sea level an eighty-five feet."

Darwin's logic on this point is recorded by M. Bonnier by imagining a more grotesque though possibly not more daring inference. It is:

"Around the hotels of Saint-Martin de Vesubie numerous tourists have lunched out of doors. They have eaten shellfish. They have left cockle shells, with a few bits of paper napkin and some fragments of wicker stuff from baskets. What shall be our conclusions on discovering these relics? Obviously, that at a fairly recent period the Mediterranean bathed this locality, which now lies at an altitude of more than 3000 feet."

Thus, so much for Darwin and Darwinism as judged by Prof. Gaston Bonnier of the Sorbonne in his "Pour et Contre le Darwinisme." And, finally, as for the Darwinian theory that treats "transformism" as a fixed dogma, it is not, according to M. Bonnier, "scientifically demonstrated, either as concerns the passage from one species to another or as concerns the inheritance of acquired characteristics."

"Transformism"—what follies and what imprudence have been committed in its name! Its end is not yet, for our philosophers are an intrepid lot, and slow to see a joke or feel an error.