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THE LAWS OF EVOLUTION

BY

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(SUMMARY)

"1. - According to the brilliant conception of the immortal *Charles Darwin* (1809-1882):

Evolution - the transformation of organisms - results from the fixation of useful individual variations provoked by the struggle for existence under the influence of *natural selection.*

All species - animal or plant - which exist or have existed *since* the appearance of life on earth, must originate via this fundamental law.

II. - But:

1. What is the cause of individual variations?

2. What is their amplitude? - Is it weak? Is it great? Has evolution been extremely slow? Or has it occurred by abrupt leaps?

3. On the other hand, is evolution reversible? - Can an organism return (completely or partially) to a previous state, already achieved in its ancestral series? - Either it arrives there by a single event; or attains it by going backwards through the various phases which created it.

4. Finally, is evolution limited? Or indefinite? - Do organisms carry within them an unlimited potential to change? - Or do they necessary die out after having covered a determined cycle?

III. - The solution to these questions is of capital importance to the biologist. And not simply for the enormous interest which they hold, but because of their applications.

IV. - Mr. Dollo is of the opinion:

1. That evolution occurred by abrupt leaps.

2. That an organism cannot return, even partially, to a previous state already realized in its ancestral series.

3. That all organisms must necessarily die out after having covered a determined cycle, - which can, moreover, be extremely long.

This is what he expressed while speaking:

Evolution is discontinuous, irreversible, limited.

V. - Following this, the author explained the reasons that, according to him, it was necessary for it to be thus.

Then he cited very numerous examples - drawn as much from living or fossil animals as from living plants - to support his point of view.

VI. - At this point, Mr. Dollo was pleased to note that his ideas were accepted by his Master, Mr. A. Giard, professor at the Sorbonne, and by his close friend, Mr. P. Pelseneer, professor at the École Normale de Gand.

He thanked these two naturalists for the cases of discontinuity or irreversibility which they were very happy to communicate to him (Mr. Giard: crustaceans, plants; Mr. Pelseneer: molluscs).

He also thanked two of his other good friends: Mr. J. Massart, assistant at the Institut Botanique de l'Université de Bruxelles, who pointed out to him many interesting facts relating to discontinuity and irreversibility in plants; and Mr. G. A. Boulenger of the British Museum, who called to his attention many points in the structure of living reptiles which were of considerable impact on these questions.

He also mentioned with satisfaction that Mr. L. Errera, professor at the Université de Bruxelles, had at least partly come around to his views.

Finally, he announced at the end that Mr. P. Hallez, professor at the Faculté des Sciences de Lille, had concluded in the discontinuity of evolution following his latest studies on worms.

VII. - These are the special studies that Mr. Dollo has pursued for twelve years on the *fossil bones* of the Musée de Bruxelles, which led him to these generalizations.

He made them known for the first time during his studies at the Institut Solvay (Université de Bruxelles) (autobiographical lesson of 12 November 1890).

Ultimately he returned to them, notably in Giard's *Bulletin* (20 September 1891) and in the *Bulletin* of the Société (25 October 1892).

VIII. - The author also remarked with pleasure that his ideas had been adopted without reservation by Mr. A. Lameere, professor at the Université de Bruxelles, in his *Esquisse de la Zoologie* (Bruxelles, 1892) and in the syllabus of his *Cours sur le Transformisme* (university extension; lesson III; 1893).

IX. - Mr. Dollo proposed to unite all the important cases of discontinuity, irreversibility, and limitation collected by his friends and himself in a small illustrated volume.

X. - Is this to say that, in the thoughts of the author, the laws outlined above are the only ones which govern the evolution of organisms? By no means. There are many other, and more fundamental, laws. Examples: the law of recapitulation, the law of necessary regression, etc."