nocent colored boy little more than a child, a murder committed by adults, in the presence of multitudes, in the unresisting presence of officers of the law, and in broad daylight on the open lake shore. Besides it must not be forgotten that this incident occurred in the most populous lakeport in the world. Chicago's fire-tug service, her beachguard and life-saving services, the yearly toll of her lakewrecks, the presence of thousands of citizens who have aided against lake hazards, or been imperilled by them, have given the city an underlying sense of human staunchness against lake dangers. If destiny desired the episode of wantonly driving a boy out into the water to drown, to be non-provocative, she could not have chosen a less favorable scene than that of a beach crowd in Chicago.

"Why is anyone surprised?" the wayfaring reader who has sought the shelter of this book, will ask, "That there was rioting?" And another question will be in the background of his thought as he reads on through the list of those killed in the riots—in the first three days—twenty Negroes, and fourteen white men. This question will persist through the absorbing, plain tale of daily existence that makes up the bulk of this remarkable city history.

The story of the great Negro migration, of rising rents for Negroes, of trades for colored women, the story of the return of the Negro soldier and of Negro churches and Negro gamblers and of unions and the color line, the record of the open-minded and reasonable view of an official of the packers, and of the wise and sympathetic comment of Mr. Julius Rosenwald—all these chronicles contribute a synthetic picture at once novel, just and deeply interesting.

"Thousands of white men and thousands of colored men stood together during the riots, and through the public statements of white and colored officials of the Stockyards Labor Council asked the public to witness that they were shaking hands as 'brothers' and could not be counted on for any share in the mob shouts and ravages. This was the first time in any similar crisis in an American community that a large body of mixed nationalities and races— Poles, Negroes, Lithuanians, Italians, Irishmen, Germans, Slovaks, Russians, Mexicans, Yankees, Englishmen, Scotchmen—proclaimed that they were organized and opposed to violence between white union men and colored union men."

One reads these pages and sees in one's sub-consciousness the tragedy vignetted at the beginning of the chronicle, the dead boy carried along the summer beach by his defeated companions. And again in the back-ground of one's mind the question rises—how guilty were the Negro rioters who, having in vain appealed to officers of the law, fought to prevent a wanton outrage to a child's life? In the reviewer's eyes the most shocking circumstance attending the outbreak of the race riots is not at all that men fought to prevent the murder of a child; but that they fought in vain. Technically wrong, their protest was morally right. No one, I think who fails to understand this can realize the basic sense of injustice which remained a foundation, a smouldering fire-log for the Chicago disorders last summer.

That is not all. Though twenty-three colored and fifteen white people were killed in the riots, the arrests of the colored people have been five times as numerous as those of white people; the indictments of colored people have been in the same proportion.

"Clear justice, irrespective of race is at stake." I quote from an appeal on the subject of an adequate fund for colored persons whom investigation shows to have been unjustly indicted—this appeal being endorsed by Miss Jane Addams, Mrs. Emmons Blaine, Dr. Bentley and other wellknown Chicagoans.

It is perhaps idle to point out that Mr. Sandburg's pamphlet makes Chicago's present outcry about her numerous robberies and murders appear irrelevant. Secret robberies and murders of adults are bound to occur in a community too lax and too thinhearted to assert itself against the open public murder of a child. But it may not be amiss to add that this was the very first item in Chicago's race riots. She should have settled this item first.

The tone of Mr. Sandburg's book is that of a good city neighbor—a neighbor of the world. Like the tales of life one's neighbor tells, the book is an unfinished story. When fate finishes it, however miserably, however well, I hope he will write more articles and collect another pamphlet; and tell us how it all ends.

EDITH FRANKLIN WYATT.

The Order of Nature

The Order of Nature. An Essay, by L. J. Henderson. Cambridge: Harvard University Press.

DROFESSOR Henderson's book appeared at a time when our common preoccupation with the world war prevented its meeting the wide recognition which it amply deserves, no less because of the profound importance of its problem than because of the originality of its thought. It is the purpose of this review to draw emphatic attention to a book which neither scientists nor philosophers can afford to ignore. The problem of the order of nature is not only one to which philosophers have been alive at least since the days of Aristotle, but it is also one which is more and more impressing itself upon the thought of the leading scientists of our own day. Thus Henderson is riding on the very crest of the tide in exhibiting the fascinating way in which philosophical speculation and the latest scientific researches converge upon the recognition of a "teleological pattern" in the physico-chemical constitution of our world.

Almost from the very dawn of any human thought which can be called either scientific or philosophical, two aspects of nature have impressed themselves upon the inquiring mind. One is that determination of phenomena according to causal law, which has been elaborated into the "mechanical" theory of nature; the other is the existence of living organisms, which exhibit in their structure and in the functioning of their parts an order, an organization, such as call almost irresistibly for an explanation in term of "purpose" or "design". This "teleological appearance" cannot be denied or argued away. Yet how is natural science to account for it? Committed, as it is, to the mechanical theory of nature, science cannot consistently countenance any appeal to the creative intelligence of God, or to the purposes of human or animal minds, or to a Bergsonian élan vital, or to a Drieschian entelechy. There is only one way open to it: it must look for an order among the properties of the constituent elements of the world, and among their laws, which shall be uniquely adapted to the needs of life. This "fitness of the environment" had been the theme of Henderson's first book, published under that title in 1913. To his first statement, there, of the principle that "biological fitness is manifestly a mutual relationship"-a fitness of the inorganic world for life no less than a fitness of life for an inorganic world like ours-Henderson now gives a more rigorous and

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detailed exposition. He surveys both the fluctuations of the mechanism-teleology debate in the history of philosophy, and the independent development of modern biological theory, in order to show, finally, how his own bio-chemical studies combine with Willard Gibbs's researches into the equilibrium of heterogeneous substances to reveal a "hitherto unrecognized order" among the properties of matter—an order which is masked when the properties of matter are considered statically, but which becomes evident when time is taken into account, i. e., when, in the light of cosmic evolution, we perceive it to be the fittest possible order, in fact a "preparation", for life.

The most significant, and at the same time the most original, point in Henderson's theory is that, whilst he admits this new order to be recognizable only from the point of view of living organisms considered as products of evolution. yet he regards it, once recognized, as constituting at bottom a purely physical and chemical problem. He is thus able to claim that, in investigating it, he is never once abandoning "the secure foundation of abstract physical science"; that he is never once stepping outside the circle of physico-chemical concepts dear to every orthodox scientist's heart. He is seeking to answer, on a basis of purely mechanical principles, the question: "What are the physical and chemical origins of diversity among inorganic and organic things?" It is at bottom the problem of individuality, of the existence of stable, durable systems, maintaining their equilibrium in the flux of physico-chemical processes.

The novelty of Henderson's approach to this problem is best appreciated by considering its bearing on the traditional issue between mechanism and teleology in philosophy. Aristotle, besides possessing already the concept of "organization" ("the animal organism must be conceived after the similitude of a well-governed commonwealth"), was the first to insist upon the need both of a mechanical and a teleological, or functional, explanation, alike of organisms and of the natural environment as a whole. The next step was Bacon's clear recognition that experience demands the separation of both methods, that physical science "must proceed, as if final causes did not exist." Leibnitz, having before him the completed principles of Newton's dynamics, drives home the same point: "According to this system bodies act as if there were no souls at all." The process of logically disentangling the mechanistic from the teleological point of view is completed by the negative outcome of Hume's discussion of the evidence for divine design in nature. At the same time, with singular shrewdness of insight, Hume formulates the scientific problem then remaining, viz., to account for that "œconomy" of nature which explains the constancy of organic forms in a world of matter in perpetual motion. He stands on the very threshold of the genuinely scientific problem: What is the source of teleological order in the constitution of the mechanical universe? Compared with this, Kant's proposal to retain both mechanism and teleology as complementary methods, but mechanism as the positive doctrine of science, teleology as a mere subjective rule of judgment (enabling science, by a convenient fiction, to consider organisms as if they had been designed), is shown to lead away from the highroad along which science was destined to travel. In spite of Kant, biology continued to investigate function and organization as facts, not merely as subjective make-believe, with the results that "organization has finally become a category which stands beside those of matter and energy". In fact, science in its progress has ignored all attempts to draw a hard and fast line between the facts of mechanism and those of teleology. Its recent

discoveries bear out Lachelier's doctrine that the laws of nature are of two sorts, one for phenomena as forming *series*, the other for these series as constituting *systems*. The more biologists and experimental morphologists learn to unravel the physico-chemical processes in living beings, the more is the recognition of systems or patterns, and thereby the problem of the order of nature as a whole, forced upon the attention of physical scientists.

This is the point where the thermodynamic researches of Willard Gibbs, culminating in a rigorous mathematical analysis of the concept of a physico-chemical system, reveal their first-rate importance. "Just as Newton first conclusively showed that this is a world of masses, so Willard Gibbs first revealed it as a world of systems." Again, "No one, not even the vitalist, doubts that the organism is a Gibbs system." It is, then, in terms of Gibbs's theory of systems that Henderson offers the more rigorous statement of the conclusions of his first book. He had there shown how the unique ensemble of the properties of the three elements, hydrogen, oxygen, and carbon, which are the most active, which give rise to the most numerous compounds, which form the most complex molecular structures, which yield the most energy in their mutual transformations, makes the actual environment the fittest abode for life. When we think of the part played by water, carbonic acid, and the carbohydrates (which constitute a "pathway from the inorganic to the organic") in the economy of nature, we see that if they were other than they are, life, as we know it, would be impossible. Yet this ensemble of properties is so infinitely improbable, when considered as a result of mere chance, that we can make it intelligible to ourselves only by looking upon it "as a preparation for the evolutionary process."

"The process of evolution consists in increase of diversity of systems and their activities, in the multiplication of physical occurrences, or, briefly, in the production of much from little. Other things being equal, there is a maximum 'freedom' for such evolution on account of a certain unique arrangement of unique properties of matter. The chance that this unique ensemble of properties should occur by 'accident' is almost infinitely small (i. e., less than any probability which can be practically considered). The chance that each of the unit properties of the ensemble, by itself and in cooperation with the others, should 'accidentally' contribute to this 'freedom' a maximum increment is also almost infinitely small. . . . But the properties of the universal elements antedate or are logically prior to those restricted aspects of evolution which are within the scope of our present investigations. Hence we are obliged to regard this collocation of properties as in some intelligible sense a preparation for the processes of planetary evolution. For we cannot imagine an interaction between the properties of hydrogen, carbon, and oxygen, and any process of planetary evolution or any similar process whereby the properties of the elements, as they occur throughout the whole universe, should have been modified. Therefore, the properties of the elements must for the present be regarded as possessing a teleological character."

Henderson was a pupil of Royce, and we may discern in the union of scientific theory with speculative insight, which distinguishes his book, an excellent example of that fruitful cooperation between science and philosophy, the fostering of which was not the least of Royce's services to contemporary thought.