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ABOUT THE HISTORY OF MATHEMATICAL ANALYSIS

Mathematical analysis, which mathematicians refer to simply as analysis, has its beginnings in the rigorous formulation of infinitesimal calculus. It is a branch of pure mathematics that includes the theories of differentiation, integration and measure, limits, infinite series [1] and analytic functions. These theories are often studied in the context of real numbers, complex numbers, and real and complex functions. However, they can be defined and studied in any space of mathematical objects that has a definition of nearness (a topological space) or, more specifically, distance (a metric space).

Early results in analysis were implicitly present in the early days of ancient Greek mathematics. For instance, an infinite geometric sum is implicit in Zeno's paradox of the dichotomy [2, p. 17]. Later, Greek mathematicians Eudoxus and Archimedes made more explicit but informal use of the concepts of limits and convergence when they used the method of exhaustion to compute the area and volume of regions and solids. In India, the 12th century mathematician Bhāskara II gave examples of the derivative and used what is now known as Rolle's Theorem.

In the 14th century, Madhava of Sangamagrama developed infinite series expansions, like the power series and the Taylor series, of functions such as sine, cosine, tangent and arctangent. Alongside his development of the Taylor series of the trigonometric functions, he also estimated the magnitude of the error terms created by truncating these series and gave a rational approximation of an infinite series. His followers at the Kerala School of astronomy and mathematics further expanded his works, up to the 16th century.

In Europe, during the later half of the 17th century, Newton and Leibniz independently developed infinitesimal calculus, which grew, with the stimulus of applied work that continued through the 18th century, into analysis topics such as the calculus of variations, ordinary and partial differential equations, Fourier analysis, and generating functions. During this period, calculus techniques were applied to approximate discrete problems by continuous ones.

In the 18th century, Euler introduced the notion of mathematical function [1, p. 142].

Real analysis began to emerge as an independent subject when Bernard Bolzano introduced the modern definition of continuity in 1816. But Bolzano's work did not become widely known until the 1870s. In 1821, Cauchy began to put calculus on a firm logical foundation by rejecting the principle of the generality of algebra widely used in earlier work, particularly by Euler. Instead, Cauchy formulated calculus in terms of geometric ideas and infinitesimals. Thus, his definition of continuity required an infinitesimal change in x to correspond to an infinitesimal change in y. He also introduced the concept of the Cauchy sequence, and started the formal theory of complex analysis. Poisson, Liouville, Fourier and others studied partial differential equations and harmonic analysis. The contributions of these mathematicians and others, such as Weierstrass, developed the epsilontic approach, thus founding the modern field of mathematical analysis [1, p. 213].

Afterwards Riemann introduced his theory of integration. The last third of the 19th century saw the arithmetization of analysis by Weierstrass, who thought that geometric reasoning was inherently misleading, and introduced the "epsilon-delta" definition of limit. Then, mathematicians started worrying that they were assuming the existence of a continuum of real numbers without proof. Dedekind then constructed the real numbers by Dedekind cuts, in which irrational numbers are formally defined, which serve to fill the "gaps" between rational numbers, thereby creating a complete set: the continuum of real numbers. Around that time, the attempts to refine the theorems of Riemann integration led to the study of the "size" of the set of discontinuities of real functions [1, p. 273].

In addition, "monsters" (nowhere continuous functions, continuous but nowhere differentiable functions, space-filling curves) began to be created. In this context, Jordan developed his theory of measure, Cantor developed what is now called naive set theory, and Baire proved the Baire category theorem. In the early 20th century, calculus was formalized using an axiomatic set theory. Lebesgue solved the problem of measure, and Hilbert introduced Hilbert spaces to solve integral equations. The idea of normed vector space was in the air, and in the 1920s Banach created functional analysis.

Thus, mathematical analysis has its history, which allows understanding its main stages of development and finding out the most important researech directions.

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IDEOLOGICAL-AESTHETIC ORIGINALITY OF FAIRY-TALES BY OSCAR WILDE

One of the theoreticians of the English aesthetics and his artist-leading practices, Oscar Wilde was prone to paradoxical expression of his brilliant paradoxes, which attracted contemporary writers, survived aestheticism as a literary trend.

Even in childhood, we fall into the hands of fascinating fairy-tales "Happy Prince", "The Nightingale and the Rose", "Star-Boy" and others. In Wilde's fairytales, a wonderful world is opened before us, full of rare things, jewelry, exotic flowers, and art.

"After the trial of Oscar Wilde at auction his property was sold out, one of the cartoonists drew items that belonged to the writer: a lot of different subjects, who had just lost their master. Among them there was a manuscript collection of tales, to which few people paid attention. Today these stories have received worldwide recognition ..." [1, p. 64].

Throughout the life, O. Wilde professed the cult of beauty. His works are the confession of love for creativity and art. O. Wilde believed that art is superior to nature and banal existence. According to what the writer said, art reflects not life, but artistic temperament of the soul. "Beauty has as many meanings as many moods a man can be in", – Oscar Wilde noted in one of his essays [3, p. 10]. Creative inspiration is filled with the beauty of imagination, fantasy. In his opinion, people lost the meaning of life, forgot how to appreciate it. It happened because they forgot about pleasure. Wilde's desire to return people to the joy of fun, was a positive impulse for the development of culture, as promoted a better harmonic development of each individual. On the other hand, the cult of pleasure, if it is not limited to moral principles, is as dangerous as the cult of Beauty, because hedonism (or new hedonism) can easily cause a person to death.

Oscar Wilde was aware of that tragic fact. He took it as a rule to seek pleasures, as the righteous people seek to do good. The complexity and contradictions of the new hedonism writer's view of his tales, including "Happy Prince". *"On a high city column there was*