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## THE UNTOLD HISTORY OF WOMEN IN SCIENCE AND TECHNOLOGY: SOFIA KOVALEVSKAYA

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***Abstract:*** *the article is dedicated to the memory of Sofia Kovalevskaya. The facts from the biography of Sofia Kovalevskaya and the main scientific achievements are given.*

***Keywords****: Sofya Kovalevskaya, biography, science, mathematics, scientific activity.*

Being the first woman elected to the U.S. National Academy of Sciences in 1925, Florence Rena Sabin understood the challenges facing women as researchers and scientists. Human history has clearly demonstrated that intellect alone has rarely been enough to assure women a role in the process of investigating and explaining the natural world. Nevertheless a lot of women made significant contributions to various areas of science, including astronomy, physics, botany and genetics, biochemistry.

It is worth noticing the genre of scientific biography has become paradoxically attractive nowadays. On the one hand, it influences strongly on the public understanding of science; on the other hand, it covers a number of interesting topics relating to science, enhancing popularization of science in modern culture [1].

The work presents a scientist biography report devoted to Sofya Vasilyevna Kovalevskaya the outstanding Russian mathematician.

Being prohibited from studying at universities in her home country, Sofya was the first woman in modern Europe to receive a doctorate in mathematics. She earned a degree at a university in Germany and was later elected a full professor at the University of Stockholm in Sweden.

**Early Life of Sofya Vasilyevna Kovalevskaya**

Sofya Kovalevskaya was born in Moscow. She was the second of three children in the family. Her father Vasily Vasilyevich Korvin-Krukovsky served in the Imperial Russian Army. In 1858 he retired to Palibino, his family estate in the Vitebsk Region. Sofya was eight years old that time [2].

Sofya's mother, Yelizaveta Fedorovna Shubert descended from a family of German immigrants to St. Petersburg. Her maternal great grandfather was the astronomer and geographer Friedrich Theodor Schubert. He emigrated to Russia from Germany around 1785. Later he became a full member of the St. Petersburg Academy of Science and headed the astronomical observatory. General Theodor Friedrich von Schubert was his son. He was head of the military topographic service, and an honorary member of the Russian Academy of Sciences, as well as the Director of the Kunstkamera museum.

A good early education was provided by parents. Sofya knew 3 foreign languages fluently due to her governesses who were native speakers of English, French, and German. At a very young age Sofia was attracted to mathematics. Her uncle Pyotr Vasilievich had a great respect for mathematics and often spoke about the subject. Sofia wrote about him in her autobiography [3]: *The meaning of these concepts I naturally could not yet grasp, but they acted on my imagination, instilling in me a reverence for mathematics as an exalted and mysterious science which opens up to its initiates a new world of wonders, inaccessible to ordinary mortals*.

Her first private tutor of elementary mathematics was Iosif Ignatevich Malevich. Arithmetic was boring for her and so she moved on to elementary geometry and algebra.

The famous physicist Nikolai Nikanorovich Tyrtov called Sofya a "new Pascal". Having noted her unusual ability, he suggested she be given a chance to continue further her education. Sofya managed to understand Nikolai Tyrtov's textbook by discovering for herself an approximate construction of trigonometric functions. She was Tyrtov's student and took lessons on analytic geometry, and differential and integral calculus, when the family was in St Petersburg.

Even though Sofya was obviously talented for mathematics, she could not complete education in her native country. At that time, women were not allowed to attend universities in Russia and most other countries. In order to continue her studies abroad, in 1868 she entered into a marriage with a young paleontologist, Vladimir Kovalevsky. They moved from Russia to Germany in 1869.

The biographical literature on Sofya Vasilyevna Kovalevskaya has to a large extent relied on her own diary, published in Vestnik Evropy and an autobiographical story published posthumously in Russkaya Starina [4].

**Scientific activity**

The most important studies are devoted to the theory of rotation of a rigid body. Having been started by Leonard Euler and J. L. Lagrange, the third classical

case of solvability of the problem of rotation of a rigid body around a fixed point was discovered by Kovalevskaya. Sofya was awarded the Prix Borodin in 1886 and won a prize from the Swedish Academy of Sciences in 1889. Later she was elected a corresponding member of the Imperial Academy of Sciences [5].

She also worked in the field of potential theory, mathematical physics, and celestial mechanics, besides she taught courses on the latest topics in analysis. Sofya was an editor of *Acta Mathematica journal*. Her last published work was an article Sur un théorème de M Bruns where she proved Bruns's theorem on a property of the homogeneous body potential function.

**Tributes**

The Association for Women in Mathematics (AWM) developed a grant-making program 'Sofya Kovalevsky High School Mathematics Day' to encourage girls to explore mathematics. The Association and the Society for Industrial and Applied Mathematics sponsor annually the Sonya Kovalevsky Lecture to highlight significant contributions of women in the fields of applied and computational mathematics [6].

In 1985 the Kovalevskaya Fund was founded to support women in science in developing countries. One lunar crater was named in Kovalevskaya's honor. A lot of high schools and progymnasiums are named after Sofya Kovalevskaya.

The Alexander Von Humboldt Foundation of Germany bestows a bi-annual Sofia Kovalevskaya Award to promising young researchers.

There are streets named in honor of Kovalevskaya in Saint Petersburg, Moscow, and Stockholm.

To sum it all up, Sofia Kovalevskaya was the first major Russian female mathematician, the first woman appointed to a full professorship in Northern Europe. She contributed important mathematical findings in the areas of analysis, differential equations, and mechanics. She was a pioneer for women in mathematics around the world – the first woman to obtain a doctorate (in the modern sense) in mathematics, and one of the first women to work for a scientific journal as an editor. Historian of mathematics Roger Cooke writes: «*...the more I reflect on her life and consider the magnitude of her achievements, set against the weight of the obstacles she had to overcome, the more I admire her. For me she has taken on a heroic stature achieved by very few other people in history. To achieve, as she did, at least two major results of lasting value to scholarship, is evidence of a considerable talent, developed through iron discipline*» [7].

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## STATE SUPPORT PROVISION TO AGRICULTURE ON "A WINDOW" PRINCIPLE

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***Abstract**: Government support of agriculture plays an important role in the development of both definite regional agribusiness and the territory as a whole. Since agriculture has a multifunctional character, especially in the Far North - in the Republic of Sakha (Yakutia) particularly, it is necessary to improve government support for agriculture, taking into account its specificity.*

***Keywords**: government support, agribusiness, multifunctionality, the Far North.*

The development and functioning of agriculture in the Russian Federation, especially in the Republic of Sakha (Yakutia) is impossible without state support due to harsh climatic conditions that make it difficult to be engaged in farming [**Ошибка! Источник ссылки не найден.**].

The effective government support of agriculture has always been considered one of the most difficult areas, both in the theory of the issue and in the practice of its implementation [**Ошибка! Источник ссылки не найден.**].

At the same time in insufficient attention is paid to the question of the multifunctional nature of agriculture [**Ошибка! Источник ссылки не найден.**], mainly in relation to the conditions of the Far North, where the efficiency of agriculture directly depends on the degree of state participation. Moreover,