ANALES DE LA
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EDITORIAL

Academy of Sciences of Cuba: Challenges and main innovating achievements from its advisory functions

Academia de ciencias de Cuba: retos y principales logros innovativos desde sus funciones consultivas (asesoría)

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The work of the Academy of Sciences of Cuba (ACC) during the period 2019 to the present, takes place in a complex stage for the world and also for Cuba. The convergence of multiple crises, which include the sanitary ones, those related to climate change, the environment and the social ones, among others, have characterized this new stage, imposing great challenges.

The COVID-19 pandemic is the most complex in the last 100 years. It caused the death of millions of people in the world and an unprecedented impact on the psychological, economic and social order. In Cuba, preparation strategies for the pandemic confrontation began from very early stages, as well as the implementation of a Government Management System based on Science and Innovation. [1] The results of these arrangements facilitated a group of actions, including the generation of 5 vaccine candidates and afterwards the 3 vaccines that guaranteed effective natural immunity against SARS-CoV-2 infection. [2,3,4]

The aforementioned led the members of the ACC, from their advisory and integrating role of the scientific community, to be inserted very early in all actions to confront and control the pandemic. The academicians, from their institutions of origin, implemented epidemiological actions and of risk control: medical, action protocols, educational actions and intensive communication to the population, psychological protocols; as well as various activities from the different Branches of the ACC located in the east, center and west of the country.

The participation of several academicians was also materialized in the creation of groups of experts that were integrated in the identification of problems that affect the development of the country, the progress of research on that issue and the proposal of solutions. The ACC includes in its membership young scientists known as young associates. The young associates also developed multiple actions fulfilling their responsibility as members of the institution.

In this way, the young academy played a more active role in society, achieving harmony and complementarity between science and conscience, born of the thought of Félix Varela and the continuity of the precepts that defined the founders of the Royal Academy of Medical, Physics and Natural Science of Havana in the 19th century, of which the ACC considers itself the continuation. [5] The results achieved mark a higher stage in the historical development of the institution, placing it in a significant place in the history of science in Cuba.

This change in the dynamics of work and the emerging responses led to consultative and advisory actions of an innovative nature, of greater priority and higher efficiency for the economic and social development of the country. The trans-

disciplinary expert groups addressed priority issues for the selection and development of scientific potential, proposals for attention to population aging and demographic dynamics, strategies to address the generational challenge related to the development of the Cuban social project, basic sciences in the foundations of the development of the economy and society, neurosciences and neurotechnology in Cuba, aspects related to the current Cuban economy, housing and the city, machine learning within the digital transformation for development, among others. All these issues have been discussed with the leadership of the state and the Government, from where important proposals arose for their solution.

Academicians are, currently, in the most important national areas where science and innovation are discussed, such as the National Innovation Council, the Working Group to Confront the Pandemic and the development of the current post-COVID-19 stage. The academicians participate in the programs and projects of the 6 macro-programs whose main objective is to achieve the main axes of the country's economic and social development until 2030, and also participate in the analysis of draft laws such as the Family Code, the Natural Resources and Environment Law, among others. The academicians also provide advice to the technical advisory councils of the bodies and agencies of the central State administration (OACE) and Higher Organizations of Business Management (OSDE), in the programs of food sovereignty and nutritional education (SAN). In addition, they accompany the Ministry of Science, Technology and Environment (CITMA) in many activities such as the new national science, technology and innovation policies, their legal norms, the creation of national science and technology programs, etc.

The work of the ACC was extended to the regional and local levels to contribute to the application of the government's management system based on science and innovation. It grew in its membership with the selection of 22 new honor academicians from all the provinces of the country. It was approved a new condition, that of ACC Associated Scientist with the aim of integrating some experts that prestige the Cuban science with the results of their work.

It was consolidated the work of existing branches and 3 new ones were inaugurated in the provinces of Pinar del Río, Artemisa and Sancti Spíritus. As part of the recognition made by the institution to the most relevant national and local scientific results, the Annual Award of the Cuban Academy of Sciences was granted to 78 high-impact investigations on current issues in several areas of knowledge. Outstanding institutions in the management and control of COVID-19, as well as scientists who participated in the development, redaction, edition and diffusion of the Family Code were recognized and some were nominated for awards conferred by the Cuban state, such as the "Carlos J. Finlay" Order.

The establishment and consolidation of relationships with national and international scientific institutions was another of the work priorities in this period. The ACC was present at national and international events, increasing its prestige. In the international arena, the ACC has been one of the most active institutions of its kind. It was increased the number of international activities focus on science organizations such as the Global Network of Academies of Sciences (IAP), the Inter-American Network of Academies of Sciences (IANAS), the International Science Council (ISC) and the World Academy of Sciences for the Developing World (TWAS).

Academicians were proposed to integrate the ISC and TWAS, achieving 4 new members in the latter. They were signed several collaboration agreements with national and international institutions, including t

he University of Informatics Sciences (UCI), the Federation of University Students (FEU), the National Academy of Sciences of Belarus (NANB) and a memorandum of intent with the American Association for the Advancement of Science (AAAS), the world's largest scientific society.

This increase in the institution's work, which corresponds to the 2018-2024 academic period, led to the development of an organizational innovation process based on the current perspectives of science, technology and innovation development. This is also related to the cross-cutting scope of the ACC's advisory actions, which included the Logistics Unit (UPr), the academy's governing documents and its affiliation status, an ongoing process.

Among the most significant changes that are taking place regarding the ACC, one is the transfer of the patrimonial headquarters to the Office of the Historian of the City (OHC), in order to guarantee the conservation of the building and all the history that it treasures in terms of science. It was deepened the process for teaching science, vocational guidance and motivation of young generations from early stages, in coordination with the corresponding agencies and ministries. A process of nomination and selection of new academicians for the period 2024-2029 began, tempered to current conditions, with a projection to regional and local work to increase the impact of science on the economic and social development of the country.

Regarding scientific communication, it is remarkable the role of the journal *Anales de la Academia de Ciencias de Cuba,* which has consolidated and positioned itself as a multi and transdisciplinary paper, the only one of its kind in Cuba. The main mission of this journal is to disseminate the results of the best scientific research carried out in Cuba regardless of

the area of science in addition to contributing to the development of regional and global science through communications duly evaluated and endorsed by experts.

To achieve greater visibility and positioning in prestigious indexing sites both regionally and globally is among its work objectives, together with the dissemination of its content on social networks. To this end, the redesign of editorial policies and the updating of the guidelines for authors are a permanent task, both based on good practices in scientific communication and on the postulates of open science, a fundamental principle to facilitate transparency, credibility and access to the results of research to authors, specialized readers and the scientific community in general.

An evidence of the results obtained in recent years is the increase in the number of visits and downloads of the different published scientific articles. (figure 1) Currently, Anales de la Academia de Ciencias de Cuba is indexed in prestigious regional sites such as SciELO, Redalyc, Latindex, among others, and work is ongoing to postulate it this year to high-level databases. such as Scopus and Web of Science.

These elements show the entrance of the ACC to a new stage characterized by innovative and novel actions in congruence with the will of the highest leadership of the country, providing the state and the government and the different social actors with excellent advice, characterized by immediacy. of their actions and proposed solutions, to help the decision-making always with an integrative and inclusive approach.

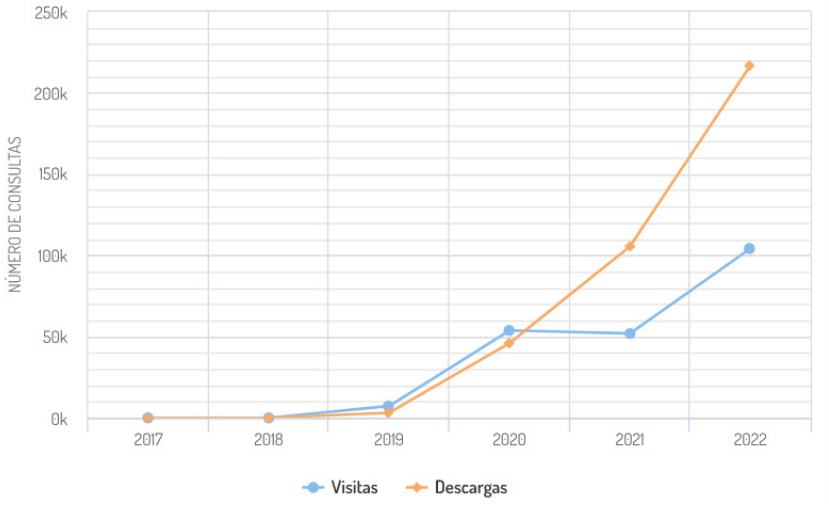

Fig. 1. Downloads and visits to the summary page of the articles published in the journal. 2017-2022

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