

The modernity of Achille Sclavo's (1861-1930) message for Italian schools 100 years after the publication of his book "*The Propagation of Hygiene*"

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Summary

A hundred years ago, Achille Sclavo (1861-1930) published his book entitled "Per la Propaganda igienica. Scuola e Igiene" (The Propagation of Hygiene. Schools and Hygiene) which he dedicated "To elementary teachers, from whom Italy expects the most effective propaganda in favor of hygiene".

The words of the dedication were profoundly felt by Sclavo and reveal a precise choice by the great hygienist. Sclavo was then at an advanced age and had devoted his whole life to studying hygiene and disseminating its basic concepts, to promote a healthier life for all.

Nowadays, Sclavo's book "The Propagation of Hygiene. Schools and Hygiene" still remains an important statement to the commitment of the great hygienist to spreading a culture of hygiene, and public health in Italy. This was a commitment that Sclavo clearly felt throughout his life, as a teacher, as a scholar, as the entrepreneur who founded the Serotherapy and Vaccinogenic Institute in 1904, and mainly as a policymaker who spoke to all citizens, especially young people.

Sclavo's involvement in public health campaigns and the dissemination of the concepts of hygiene

A hundred years ago, Achille Sclavo (1861-1930) [1] published his book "*Per la Propaganda igienica. Scuola e Igiene*" (*The Propagation of Hygiene. Schools and Hygiene*) which he devoted "To elementary teachers, from whom Italy expects the most effective propaganda in favor of hygiene" [2] (Fig. 1).

Sclavo focused on many of his many studies and his professional life on hygiene, public health and spreading its essential, simple, and fundamental thoughts, in order to promote a healthier life for all [3].

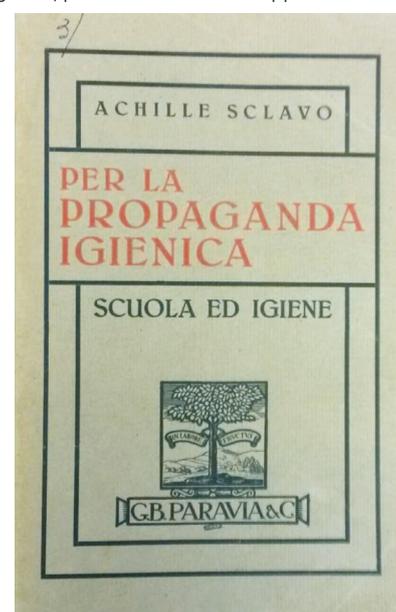
Born in a small village in Piedmont, Achille Sclavo (1861-1930) graduated in medicine at the University of Turin on 19 July 1886. During the next year (1887) he was called by his mentor Luigi Pagliani (1847-1932) to the General Directorate of Health (Direzione Generale di Sanità), as a member of the work-group founded by prime Minister Crispi to reorganize national healthcare policy [3].

In this period, fortified by the outcomes of Louis Pasteur's studies and findings into the techniques of attenuating the virulence of germs, and the following implications for the preparation of new vaccines (live attenuated vaccines), Sclavo carried out rigorous experiments and researches on the biology of *Bacillus Anthracis* [1].

At the beginning of the 1890s, following his promotion

to Director of the Bacteriology Laboratory and his appointment as a teacher at the Upper School of Hygiene (Scuola Superiore di Igiene), Sclavo started original studies on anti-diphtheria and anti-anthrax sera. In particular he carried out serious and remarkable

Fig. 1. The book cover of Achille Sclavo, "Per la Propaganda igienica. Scuola e Igiene", published on 1924 (Gruppo Anziani Sclavo - Siena).



experiments on the biology of "Bacillus Anthracis" and as a result, he was able to discover a new method of achieving immunity to anthrax, in both animals and humans, by using serum achieved from infected sheep [1].

He continued and developed this scientific inquiry and advanced activity when, in the academic year 1896-1897, he was appointed to teach Hygiene at the University of Siena. A year later, in 1898, he became Extraordinary Professor of Hygiene and Director of the Laboratory of Hygiene.

Sclavo was therefore able to develop great experience in the fields of Hygiene and Public Health through his collaboration with Luigi Pagliani himself, Pietro Canalis (1856-1939) and Alfonso di Vestea (1854-1938) [3].

Achille Sclavo belonged to the second generation of Italian hygienists.

As Professor of Hygiene at the University of Siena, Sclavo made a great effort in the national health campaigns against cholera, smallpox, typhus and malaria [1].

Between 1893 and 1911 he was closely involved in the government's public health campaigns and in the fight against the serious diseases present in various parts of Italy, where the state of health of citizens was severely impaired by poverty, misery and, above all, ignorance.

On behalf of the government, in 1893 he took care of Cholera in Alessandria (Piedmont region in northern Italy) e in Campobasso (Molise region in southern Italy) in 1893; in 1910 in Sardinia to organize the new guidelines and criteria for the anti-malarial campaign with Alessandro Lustig (1857-1937) an Austrian-Italian pathologist who worked on a number of infectious diseases and their management and Michele Alivia (members together with Sclavo of the Commission of the Ministry of the Interior) [3].

He went to the region Puglia between 1910 and 1911 to fight cholera and prejudice, superstitions and ignorance of the population about the approach to infectious diseases; he also took care of water supply in the different affected areas. He also went to Palermo and his province in 1911 to eradicate smallpox and cholera. In 1904, he founded the Sclavo Institute of Serotherapy and Vaccinology[3].

His tireless commitment to improving the well-being of citizens enabled him to "recognize the sad conditions and needs of the population and, above all, to realize how necessary it was for people to try to achieve a sufficient level of education, including education in the concepts of hygiene, correct nutrition *etc.* [...]". In particular, epidemics of cholera and smallpox involved him personally in public interventions for prevention and safety. Indeed, he drew up the necessary prophylactic measures and came to the realization that many improper behaviors depended on people's ignorance and prejudice. He also observed that these behaviors could easily be modified when, through careful and constant persuasion, the population was induced to follow a few simple, well-illustrated rules of hygiene [4].

He therefore determined to raise public awareness, firmly convinced that, alongside the work of scientists and

doctors, a true "inner revolution" [5] should be fomented among the people, a revolution that would favor the progress of public health and generate a healthy respect for human life in its psycho-physical entirety. Indeed, according to Sclavo, it was necessary "to win over the soul of the whole people to the cause of hygiene" [6] - an important and indispensable reflection that would be followed in the years to come.

Despite being professor of Public Health at the University of Siena since 1898, to achieve this fundamental objective, Sclavo determined to address his message to the widest possible audience: soldiers, priests, medical officers, those in charge of public services, ordinary people. Thus, it was that his simple and clear "conversations", held in "common language" that was accessible to all, attracted an ever-increasing number of attentive listeners, beyond all expectations" [7].

He taught theoretical and practical courses to nurses and Red Cross soldiers on the prevention and prophylaxis of infectious diseases and nutrition. Among the collaborators and colleagues who cooperated with Sclavo to these projects the authors of this manuscript remember his pupil Giovanni Petragani (1893-1969).

Sclavo wanted to present a new profile of the doctor-hygienist, characterized - in addition to specialist skill - by a profound knowledge of the social and health situation of the time, by great humanitarianism and by the extraordinary fervor of a lay apostolate.

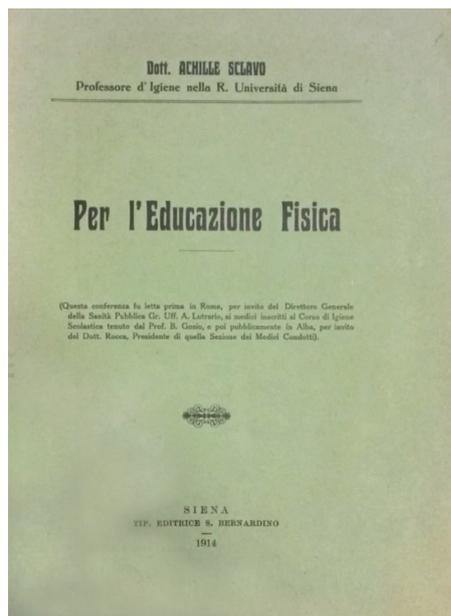
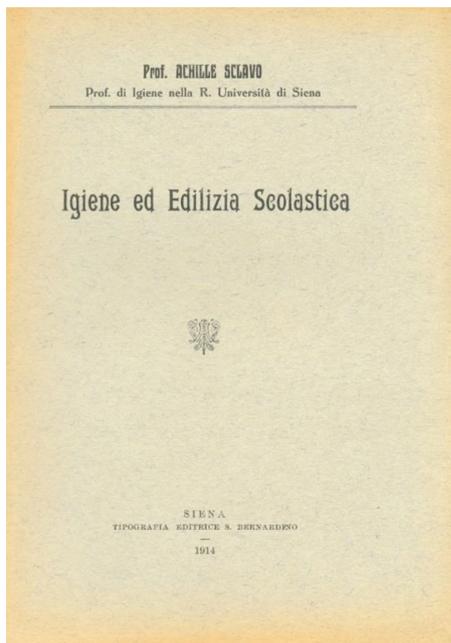
In this respect, it should be pointed out that at the beginning of the 20th century, Sclavo was one of the founders, and the first president, of the Italian Association for Public Health [1].

He soon became convinced that full "hygiene awareness" could only be achieved through a slow learning process, and that this would be difficult to implement in the domestic environment, owing to the ignorance and prejudices of parents. It was therefore necessary to act through the school, on teachers and, above all, on the young, who were not burdened by the erroneous beliefs of their elders and were receptive to change. From this perspective, Sclavo believed that the teaching of hygiene had to free itself of its purely theoretical character and take on a more practical and applicative form.

"The Propagation of Hygiene": the school at the center of Achille Sclavo's educational message

Prof. Sclavo began by writing new manuscripts dealing with the difficult situation of schools of the time. In his publication "*Igiene ed edilizia scolastica*" (School buildings and hygiene) (1914) (Fig. 2), he specifically denounced the disconcerting reality of school buildings and proposed solutions to the most widespread health problems. He often expressed his dismay at the various governments' neglect of school problems, promptly denouncing the serious structural and moral shortcomings of the school system: "That schools in many places contribute to damaging children's health

Figs. 2, 3. Two publications by Achille Sclavo on hygiene problems in schools and physical education.



emerges from many facts, which have also been exposed in several well-known reports” [2].

In the same years, Sclavo wrote papers on proper nutrition, outdoor education and the benefits of physical activity for the healthy development of young people: “*Per l’educazione fisica*” (Physical Education) (1914) (Fig. 3); “*Diama aria ai nostri polmoni*” (The Air We Breathe) (1915), his manifesto in favor of sunlight and pure air in the fight against tuberculosis; “*Sull’alimentazione umana – 5 lezioni tenute in Firenze alle infermiere della Croce Rossa italiana*” (On Human Nutrition - 5 lessons for nurses of the Italian Red Cross held in Florence) (1917); “*Per l’igiene sociale*” (On Social Hygiene) (1918).

Regarding these issues, and particularly the fight against tuberculosis and the importance of healthy and climatically salubrious environments, we should also remember the great work of the Genoese Prof. Edoardo Maragliano [8].

Through his teaching, his creation of facilities for the treatment of tuberculosis and sanatoriums [9] and his extensive propaganda to improve the living conditions of the population and promote prevention, Maragliano did so much [10].

He and Sclavo were both important scholars of that time; they respected each other and sometimes conducted similar studies. Their commitment to public health, epidemiology, hygiene, and infectious diseases was undoubtedly a common denominator of their research.

While continuing his university teaching, in his mature years Sclavo also devoted himself to a form of popular teaching. What he had observed during his life led him to regard youth as the most promising field in which to sow the precepts of hygiene, as “in its ability to adapt, youth is wax; in retaining the impressions received, it is bronze” [4]. He therefore promoted so-called “ascending education”, whereby young people became the messengers of good practices among adults, parents and relatives, who often ended up recognizing their usefulness.

This was the underlying concept of his book “*The Propagation of Hygiene. Schools and Hygiene*”, which constitutes a basic reference for a full understanding of the ideas of Sclavo as an educator.

The aim of this publication was to disseminate the basic concepts of hygiene and medical sciences in a simple and accessible way: a veritable model of scientific communication which starkly reveals the ingenuity of the scientist, the acuity of the politician and the simplicity of the common man. Through this original work he intended to provide Italian children and young people with an awareness of hygiene and an education. To do so, he abandoned traditional, uniform and standardized teaching methods, which ended up stifling children’s interest and natural spontaneity, and explored new pathways.

“He had the most eminent qualities of the teacher: clarity and effectiveness; and above all he knew how to instill into his listeners the ardor and conviction that animated him, the enthusiasm with which his soul was pervaded, the faith in success that he regarded as indispensable” [11].

“First of all, the child must be provided with a healthy and well-governed school, where he must especially acquire those habits of cleanliness and hygiene which will protect him from many diseases. Furthermore, his brain must be trained in the most appropriate way, without fuss and with a judicious choice of what must penetrate it, in order to create knowledge, beliefs and desires. The school has to educate the child to live in society [...] As these tasks are very closely inter-related, it will be advantageous for the Hygienist to collaborate actively and cordially with the School Teacher, the one helping the other” [2].

The new School that Sclavo envisaged had new and broader educational purposes, including the development of a critical and reflective attitude in the pupils. And in this new vision of the school the teacher had a central role in bringing out students' individual talents, promoting diversified activities and responding to the natural curiosity of children by tracing a pathway to knowledge through dialogue.

For Sclavo, Dialogue was fundamental: it was the very pivot around which his educational idea revolved. According to his innovative vision, the teacher should not give lessons, but talk with the pupils in order to get them to think about scientific concepts. This is why, in the book *"The Propagation of Hygiene"*, the word "lesson" is never mentioned, while constant reference is made to the term "conversation". This was a deliberate choice by Sclavo, and well represents his rejection of a spoon-feeding approach to education and his adherence to an "educational model based on the construction of knowledge" [12].

The first chapters of the book contain interesting indications on how to set up and prepare an "outdoor school". Indeed, Sclavo notes that "in the Garden of an Outdoor School nature provides the teacher with precious material to help him to impart the most useful knowledge, through observation and experiment and in an enjoyable way" [2].

The most innovative intuition of the outdoor school was the subversion of traditional teaching methods: "Almost everywhere, the ordinary school lends itself poorly to objective teaching. As Dewey rightly observes, the current school environment is specially designed to transmit ideas through words; it is not suitable for an education that arises from the judicious use of the various sense organs" [2].

John Dewey (1859-1952), the American pedagogist to whom Sclavo refers, claimed that, in the context of education, the notion of experience was of value. For Dewey, knowledge was nothing other than the most complex and effective way of solving life's problems.

In this perspective, Sclavo encouraged teachers to propose to their students six topics of conversation - reported in the book - regarding the concept of cleanliness.

These were followed by a series of interventions on physical education, rules for protecting oneself from cholera and tuberculosis, and a section on solidarity, because "the interests of hygiene are closely intertwined with those of solidarity" [2].

Sclavo's commitment to healthy childhood

Using simple language and copious examples, Sclavo focused above all on tuberculosis, "one of the most severe diseases that afflict humanity" [2]. In his book *"The Propagation of Hygiene. Schools and Hygiene"*, he concisely summarized the useful information "that most needs to be disseminated among the public through schools" [2]. He explained the cause and the forms

of tuberculosis, swept away false beliefs, such as that tuberculosis was hereditary, or that it only affected the elderly. In addition, he provided a series of important precepts of hygiene, such as avoiding spitting, as tuberculosis bacilli can be found in saliva, and covering one's mouth with a handkerchief when sneezing.

He also pointed out that tuberculosis bacilli that can infect humans are often found in cow's milk and therefore recommended boiling milk before drinking it [13]. "Crockery, cutlery and glasses used by a tuberculosis patient in the family should be disinfected by boiling them in water and ash for a quarter of an hour", he explained. The patient's clothes and bed linen should be exposed to the sun often and for a long time, as "direct sunlight kills Koch's bacilli". And "Tuberculosis patients should refrain from kissing other people, especially children, and it is very important that the tuberculosis patient sleeps alone in a separate room" [13].

These were issues that Sclavo addressed and disseminated to his students and the population right from the beginning of his career.

He also dealt specifically with children's health. Indeed, in the opening speech of his first university course in Siena, he argued that childcare should be among the first issues in any health program aimed at reducing infant mortality [14]. In the following years, he underlined the importance of focusing on childhood, both in order to improve children's health, and therefore to reduce mortality in the first years of life, and as a primary objective of education aimed at promoting knowledge of hygiene in the population.

He later became involved in designing and constructing school facilities that complied with the principles of hygiene, such as the nursery and the outdoor school on the terraces of the Medici Fortress [15] (Fig. 4).

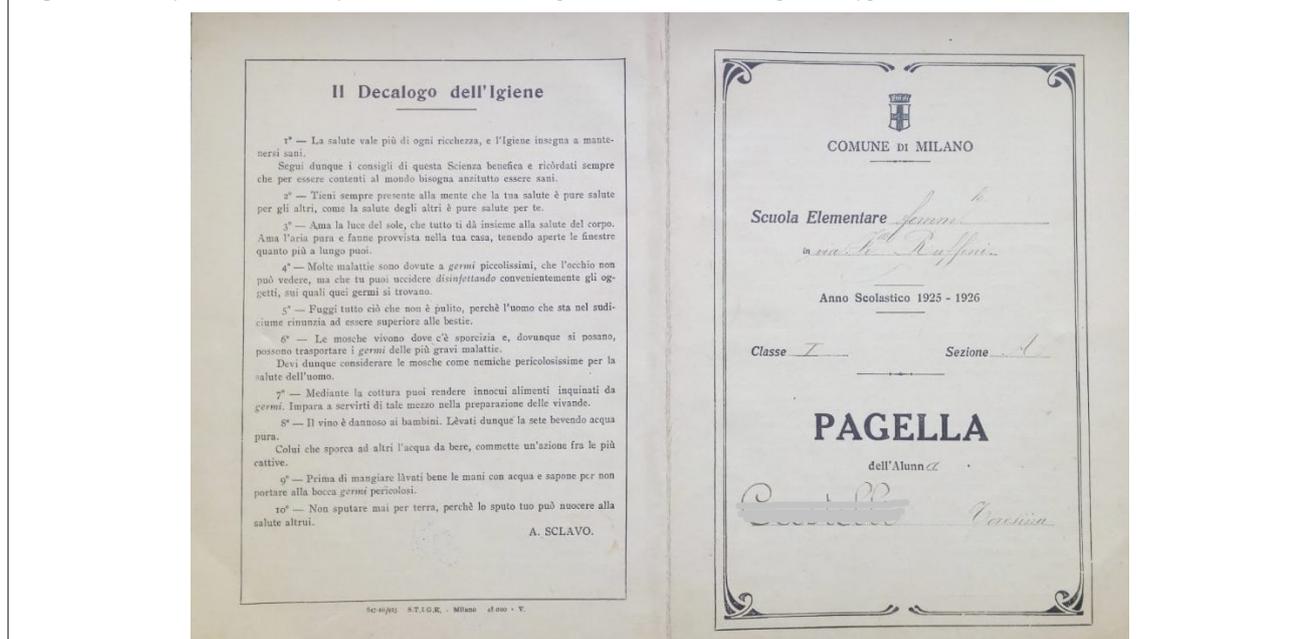
His aim was to create healthy environments where the precepts of hygiene could be integrated with physical education, thereby supporting the fight against tuberculosis [16, 17].

Sclavo concluded this section of the volume with a recommendation to all children and young people:

Fig. 4. Children and teachers in the open-air school created by Achille Sclavo in the Fortress of Siena (Archivio Sistema Museale Universitario Senese, University of Siena).



Fig. 5. School report card for the year 1925-1926, showing Achille Sclavo's Decalogue of Hygiene on the back. (Private Collection).



“To strengthen the human organism, to extinguish tuberculosis infection before it appears, and to recover from the disease, you must live according to the rules of hygiene. This means, among other things, spending a long time outdoors; keeping the house clean and changing the air often by opening the windows; eating adequately and sufficiently; keeping the body perfectly clean and doing appropriate physical exercise” [2].

These prescriptions are also repeated in the *Decalogue of Hygiene*, which closes the book. Among them, the following invitation to children and young people is significant and certainly reflects Sclavo's thoughts on the fight against scrofula and tuberculosis: “Love the sunlight, which gives you everything, not just a healthy body. Love pure air and stock up on it in your home by keeping the windows open whenever you can” [2].

Achille Sclavo's *Decalogue of Hygiene* was widely distributed to the school boards, and from them to the schools; to the Episcopal Curias, which then circulated it among the parish clubs; to the Provincial Offices for Italian Youth and to the Industrial Associations, which in turn distributed it in the seaside and mountain youth colonies.

The distribution of these simple precepts of hygiene was so widespread that in the mid-1920s they were even printed on the back of school report cards (Fig. 5).

Conclusions

Today, Sclavo's book “*The Propagation of Hygiene. Schools and Hygiene*” still remains the highest testimony to the commitment of the great Sienese hygienist to spreading a culture of hygiene in Italy. This was a commitment that Sclavo keenly felt

throughout his life, as a teacher, as a scholar, as the entrepreneur who founded the Sclavo Serotherapy and Vaccinogenic Institute [18] in 1904, and especially as a politician who spoke simply to all citizens, particularly young people.

And it was precisely to his young students that Achille Sclavo had made this heartfelt appeal since 1908:

“Young people, I remind you that Hygiene uses every means to achieve its purposes, so that you can all carry the weapons of Hygiene in your hands, in order to defend the greatest of rights, the right to life. I wish you well in the continuation of your studies, and, as a fisherman with a passion for helping the Science I profess, I take heart from the hope that today I have successfully cast my nets into the wholesome sea of your honest consciences” [19].

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Informed consent statement

Not applicable.

Data availability statement

Not applicable.

Conflicts of interest statement

The authors declare that the research was conducted in

the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Authors' contribution

DO: conceived the study; DO and MM: designed the study. DO and MM: drafted the manuscript; DO, MM, MLC: performed a search of the literature. MB and MLC: critically revised the manuscript, DO and MM: conceptualization and methodology. MLC and MB: investigation and data curation. MM and DO: original draft preparation. MLC: review. MM: Editing. All authors have read and approved the latest version of the paper for publication.

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