

RACHEL CARSON AND HER ATTACK ON GREENERY¹

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The awareness about the damage that humanity and its development do to the planet did not arise from nowhere. Moreover, the first alarms were initially dismissed because they questioned the economic progress and the fundamentals of Western culture at large. This article reminds us of the difficulties of one of those first battles for something that seems so obvious to us today: the damage caused by pesticides both to humans as to the planet.

On April 3, 1963, the marine zoologist and renowned American author, Rachel Carson (1907-1964) made her first televised appearance as the protagonist of the CBS news program, *The Silent Spring of Rachel Carson*.² Before an estimated audience of 10 to 15 million viewers, and after ten months of controversy since the publication of the book whose title evoked the absence of birdsong and the hum of insects, Carson could, finally, massively unveil the fatal consequences emanating from domestic pesticides.

Thanks to *Silent Spring* (1962), Carson has gone down in history as one who demonstrated that while pesticides were used indiscriminately to maintain a synthetic version of the pastoral vision of America (equivalent to a simple, bucolic and materialized life in the permanent greenery of parks, suburbs, golf courses and roads), the same landscape that was sought to idealize and protect was being destroyed. The reason was simple: the chemicals, especially chlorinated hydrocarbons such as DDT (dichloro-diphenyl-trichloroethane), were toxic compounds with an irreversible storage capacity on land and water and, therefore, harmful not only to insects, plants, fish, birds and mammals, but also to humans. And at a time when weapons of mass destruction detonated, and when the analysis were done to determine the levels of radiation in children's teeth, Carson could expose pesticides as one of the dangers of the Atomic Age³:

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We spray our elms and the following springs say nothing about the robins' song [...] not because we sprayed the robins directly but because the poison traveled, step by step, [...] through the elm leaf-worm-robin cycle (Carson, 1962:189).

Therefore, it was time for humanity to assess the long-term risks of actions that could modify the series of patterns of relationships between organisms or, as Carson says, "the web of life – or death – that scientists know as ecology"⁴(Carson, 1962:189).

While this reflection might seem obvious to us today, in the Anthropocene era, this article exposes how Carson's critique of the idea of falsifying nature as an argument to create, maintain and multiply landscapes, offered a platform for action for those who expected an ecological agenda based on the control of water, soil and air pollution. Even more: in the middle of a galloping urbanization that put the idea of progress before justifying any action, we will see how Carson's attack on greenery would also determine the disconnection of landscape studies from their origins, historically linked to gardening, botany and horticulture.

Green Meadows without Spring

Until the strange and nightmarish events of the year 1965, the community of Green Meadows was as pleasant a place to live as anyone could wish to find [...] for many years the town and the surrounding farms had been a harmonious part of the earth that supported them, and so they remained until shortly before the fateful year of which I write. (Carson, ND).

With this paragraph Carson began her first version of "A Fable for Tomorrow", the introductory chapter of *Silent Spring* that transported the reader to a known area, "a

FIG1 A la distancia, la visión de Green Meadows propuesta por los ilustradores Lois y Louis Darling (1962) para el capítulo introductorio de *Primavera silenciosa* correspondía al de una comunidad rural, un escape de la ciudad para vivir en medio de la naturaleza. / From a distance, the *Green Meadows* vision proposed by illustrators Lois and Louis Darling (1962) for the *Silent Spring* introduction chapter, corresponded to a rural community, an escape from the city to live at the heart of nature.



FIG 2 Captura de pantalla del programa de CBS, / Screenshot of the CBS program "The Silent Spring of Rachel Carson" (3 abr. 1963)

city in the heart of America where all life seemed to live in harmony with its environment," (FIG. 1) or at least until "the voices of spring" were silenced⁵ (Carson, 1962:1,2). In Green Meadows there were no flowers, the edges of the roads "seemed to have been swept away by fire", the cattle "had developed symptoms of acute intoxication", and the farmers had put signs in their orchards announcing: "DANGER - Fruit in the ground is poisonous."⁶ In the first versions of the text, the cause of the destruction had not been "an evil spell," as the final publication proposes, but "a granular white powder" that "housewives had swept where they could."⁷ Moreover, Carson stated that "the nightmare" was the result of actions promoted by the US government that "had sent airplanes over thousands of acres to deposit a heavy dosage of an extremely lethal poison from a small beetle."⁸ Carson's elegy for the pastoral dream updated the questions of Ishmael, the narrator of Melville's whale story, about the absence of green lands as evidence of the domain of a meaningless urban life. In the same terms Carson wondered: "The birds... where have they gone?" (Carson, 1962:2).

The persuasive style of her narrative was not casual. Carson was already a recognized author, whose trilogy about underwater world had allowed her to be included in the list of best-selling authors in the US, thanks to a style that perfectly combined sophisticated scientific evidence with friendly stories of ocean life.⁹ And in the same way that she was able to reveal the Atlantic coast to her readers, she would now demonstrate how her countrymen's arrogance had no limits, manifesting their conquest attempts to eradicate insects with the same impetus as their aspirations to colonize space.

Thanks to her contacts in The United States Fish and Wildlife Service (USFWS), where she was the editor in charge of their publications between 1936 and 1952, Carson obtained first source information which indicated that, probably since the late 1940s, Americans had been exposed to operations of mass pesticide application, planned and executed by the Department of Agriculture and local governments (FIG. 2): the experimental use of DDT and heptachlor in sections of the east coast to fight graphiosis – a fungicidal disease that affects elms – the use of dieldrin against red ants (*Solenopsis*) in southern states; the fruitless battles in the center of the country, fought with DDT, lead arsenate and chlordane, against the Japanese beetle (*Popillia japonica*); and campaigns to use DDT to eradicate the hairy lizard (*Lymantria dispar*), also on the east coast.¹⁰



This is how Carson in *Silent Spring* – serially published in *The New Yorker* between June and July 1962 – introduced a compelling accusation against mankind's destructive capacity by establishing that pesticides constituted an air and mobile threat as dangerous as radioactive rain. Its target of criticism was not only the chemical producing companies, but also those who facilitated its production and promoted its use: a government that hoped to maintain an insect-free environment and, with it, the greenery of its cities and roads; real estate developers and the golf industry embracing the image contained in perfect weed-free grass mats; and the inhabitants of the suburbs, competing with each other for the better cared for garden and the more resistant to climatic swings.

And that Sunday of April 1963, Carson's words stating that science and technology applied without control were threatening life on earth resonated throughout the program, from the opening credits with a nightingale slowly disappearing from the screen while it was covered by a dense and gray smoke cloud, to the images of trees, paths, houses, citizens and children threatened by clouds of white dust, spread by airplanes and tankers (FIG. 3). In order to avoid all kinds of skirmishes, the producers of the program used Carson's soft but firm voice reading excerpts from her book to articulate interviews with ten other participants, mostly members of government agencies.¹¹ While the US Secretary of Agriculture, Orville Freeman, led the official position of skepticism in the face of Carson's "complaints", Robert White-Stevens, from the Agricultural Research and Development Division of the American Cyanamid Corporation, appeared as spokesperson for the organized counterattack of manufacturers, distributors and pesticide users.¹²

In her interventions in the program, Carson emphasized that with her book she did not seek to prohibit the use of chemicals, but to request the necessary investment to investigate their role in the alteration of species; create specific compounds for the control of particular insects; and evaluate the use of biological agents as an alternative to pest control. But, as she supposed, her opponents put aside a polished scientific training in comparative anatomy, physiology and evolutionary animal biology at Johns Hopkins University and the USFWS, presenting her as a single novel writer, uninformed and outside the institutional framework of knowledge production and, therefore, unable to understand the 'fundamental' role of pesticides in the country's economic development.¹³ In fact, recent reports had established that

1961 set a new record in pesticide sale, reaching a total value of 300 million dollars, equivalent to a production of more than 300,000 tons.¹⁴ With this test, White-Stevens would insist that this 1.8 kg of production per capita was the scientific answer to fight agricultural pests capable of bringing humanity back to the “dark ages.”

Carson’s televised distance from the scientific community was not only recorded in her vocal tone, but also in contrasting images with white apron scientists sitting behind their desks and surrounded by test tubes (FIG. 4). Carson’s images while observing and taking note of what she sees on the outskirts of her property on Southport Island, Maine, immortalized her as a successor to a tradition defined by Henry David Thoreau’s explorations across the Concord and Merrimack rivers, John Muir’s climbs in Sierra Nevada and the walks of Aldo Leopold in Wisconsin prairies, expanding with them the traditional meaning of field work, making it a means of knowledge *in situ* to record the particularities of a place, and thus properly evaluate the action of mankind on what was considered wild and pristine nature.

Certainly, in this context Carson appeared caricatured as a nature lover, promoting its balance through organic gardening.¹⁵ But White-Stevens’ biblical association to the consequences of a pesticide use suspension, where “the insects and diseases and vermin would once again inherit the Earth,” putting it at risk of famine and suffering, was cleverly refuted by Carson with Hesiod’s golden age, stating that chemicals were “modern and terrible weapons” that “primitive scientists” had used against insects and, therefore, against the earth itself (Carson, 1962). The closing image, with the look of Carson lost on the horizon (FIG. 5), reflected that her pessimism against the role of humanity, which, in the face of 60s’ nuclear scene, manifested itself in the latent threat of the untimely appearance of an atomic cloud, an idea reaffirmed in her final words:

We still talk in terms of conquest; we haven’t become mature enough to think of ourselves as a tiny part of a vast and incredible universe. Man’s attitude towards nature is today critically important simply because we have now acquired the fateful power to alter and destroy nature, but man is a part of nature and his war against nature is inevitably a war against himself [...] Now, I truly believe that we, in this generation, must come to terms with nature and I think we are challenged as mankind has never been challenged before to prove our maturity and our mastery, not of nature, but of ourselves (Carson, 1962).

While the main thesis of *Silent Spring*, from a scientific point of view, was that the concept of tolerance was not enough to regulate the use of pesticides, its greatest public impact was in denouncing that US suburbs, supposedly the safest places in America, had been sprayed with agents as lethal as the atomic bomb.¹⁶ But, ironically, this attack had been the main strategy to tame and preserve the artificiality of the old pastoral vision, embodied in curved paths, groves and green meadows (FIG. 6).

In the United States, the idea of living in the middle of nature gained strength with the development of the National



FIG 3 Captura de pantalla del programa de CBS, / Screenshot of the CBS program "The Silent Spring of Rachel Carson" (3 abr. 1963)

Highway System that, starting in the mid-1950s, would favor the efficient movement of the population, based on the idea that its dispersion in low-density groups, would decrease the number of victims in case of a nuclear attack (FIG.7). In fact, when announcing the plan in 1955, President Dwight D. Eisenhower argued that new roads were necessary not only to support the projected population increase, but also to ensure "quick evacuation of target areas, mobilization of defense forces, and maintenance of every essential economic function" in case of war (Eisenhower, 1955). Contradictorily, those who would flee from the so-called Zero Zones would find security in configured areas thanks to the use of forces equivalent to those of a massive attack or, as Carson says, "in hundreds of suburban real estate developments, where the first act is to cut down all the trees and the next is to build an infinitude of little houses, each like its neighbor" (Carson, 1954).

Her focus of criticism would then advance to the same suburb inhabitant who, "judging by the carefree liberty with which dusts for lawn treatments by suburbanites are laced with chlordane," apparently does not announce the high levels of toxicity involved (Carson, 1962:24). Therefore, if the 'suburbanites' remained unaware of pesticide damage, logic forced them to ask why. Carson's next step would then be to question research investment of the industries involved, particularly their support to universities and, more specifically, the institution that "deliberately confused" the use of chemicals in crops with "the daily use of housewives and home gardeners": the US Department of Agriculture (USDA) (RCP, C.64, c.1147).

The "Green Section" of Agriculture and Golf

The USDA was created on May 5, 1862 with the purpose of studying, controlling and monitoring plant and animal diseases, a focus that it controlled until the beginning of the twentieth century when it sought to promote the improvement of engines and the productivity of agricultural activities. Almost simultaneously, in July 1862, the Morrill Decree was verified, which established the creation of a national system of agricultural colleges to educate the working classes, linking from the start the new department



4A



4B



4C

FIG 4 Captura de pantalla del programa de CBS, "The Silent Spring of Rachel Carson" (3 abr. 1963). De arriba a abajo: Freeman, White-Stevens y Carson / Screenshot of the CBS program "The Silent Spring of Rachel Carson" (Apr. 3, 1963). From top to bottom: Freeman, White-Stevens y Carson

FIG 5 Secuencia de imágenes del programa de CBS, / Image sequence of the CBS program "The Silent Spring of Rachel Carson" (3 abr. 1963)

with the production of knowledge and public service.

The research was instituted in 1887 with the approval of the Hatch Decree, ensuring the operation of agricultural experimentation stations in the institutions.

Grass research was part of the USDA initiatives and evolved at the same time, from the search for varieties of better quality and greater resistance, to the development of large-scale plantation in the 50s. Even though grass is literally a *gramineae*, its economic uses were not limited to forage production (Dayton, 1948). In fact, in order to improve the 'appearance' of rural scenery, in 1901 the US Congress allocated 17 million dollars to search for "the best native and foreign [pasture] species [...] for turfing lawns and pleasure grounds" (Goldin, 1977:143). This event, coupled with the invention of the lawnmower in 1868, the opening of the first golf course in New York in 1888, and the foundation of the first Garden Club in Georgia in 1890, supported the use of grass with aesthetics purposes. Even more interesting is that, the national need for green grass every day of the year, was activated through research carried out by the USDA in its academic experimental agricultural stations, in association with the golf industry.

November 20, 1920 marks the beginning of the formal collaboration between the USDA and the American Golf Association (AGA) thanks to the creation of the Green Section, an organization of clubs in charge of developing scientific instruments to manage the fields adequately, ensuring "full assistance from practically all the scientists of the country [...] actively investigating the various factors that determine quality in turf."¹⁷ (us Golf Association, 1921:7)



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The first studies were focused on the identification of pests and the search for suitable varieties for the game development. However, by 1926 and until the dawn of World War II, research applied to the development of optimal conditions, independent of soil types and climate, which meant experimentation with fertilizers and the production of successfully controlled pests and weeds. In 1941, the Section reported that they had about 5,000 golf courses in the US, adding a total of 263,045 ha, which, in their own words, needed “to be maintained under conditions which in agriculture would be considered as intensive cultivation [...]” Likewise, it is estimated that an area of more than 4 million ha and almost 5 million km of roads “are or should be in turf” (*Timely Turf Topics*, 1941:1,4). Such a statistic was not minor: the success of turf production was valued as if it was an agricultural crop was the first step to treat as such not only golf courses, but also parks and gardens.

The development of World War II would be the next link, becoming the ‘ideal scenario’ for mass use of DDT to eradicate lice and to control insect-transmitted diseases, which threatened the security of the troops (FIG. 8). After a series of reports stating that low doses killed the pests “in a relatively non-toxic manner,” the same companies that had produced the millions of tons required by the US military appealed for the approval of civil use, which was took effect on August 1, 1945¹⁸ (Russell, 2001:124). This provision determined the direct link of the industry with the academic research developed by the USDA: the ‘Turf Research Fellowships’ for postgraduate students were created, and specific funds to test safe uses of the chemicals in the agricultural experimental stations, funding that was equivalent to 10% of the total involved in the creation of a single compound.¹⁹

In 1948 the DAEU Yearbook was already proclaiming: “Grass can make beautiful the hillsides, schoolyards, roadsides, farmsteads; in so doing it brings greater utility and efficiency. Beauty also brings serenity, and serenity is a quality we and the troubled world need” (DAEU, 1948:vi,315,325). The publication also recommended the use of green meadows to “make golf enjoyable,” to “make a house a home” and to “improve the appearance of the highway,” reporting that, according to the experiments carried out at universities, all compounds used to control pests and weeds were safe enough “to allow our children and pets to play on the grass.” (Davis and Harrington, 1948:297) (FIG. 9)

After this general description of the activities developed and promoted by the golf industry, let’s remember the beginning of everything: the efforts of players, partners

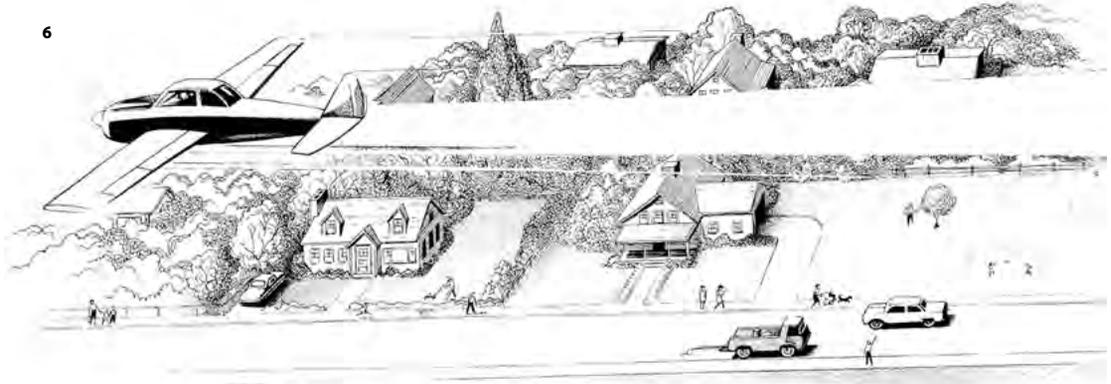


FIG 6 Distribución de pesticidas “indiscriminadamente desde los cielos” y sobre los suburbios, según la ilustración de los Darling para el capítulo homónimo de *Primavera silenciosa* (1962). / Distribution of pesticides “indiscriminately from the skies” and over the suburbs, according to the Darling’s illustration for the homonymous chapter of *Silent Spring* (1962)

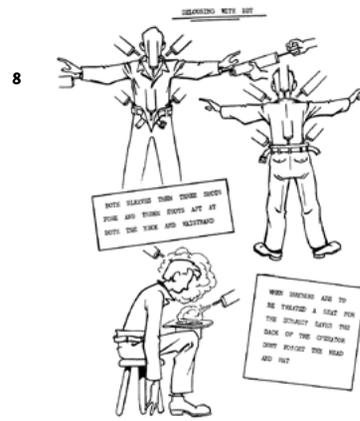
FIG 7 Tal como lo expresara el diagrama explicativo publicado en la revista *Life* del 16 de junio 1947 (p.29), “si las áreas habitadas de E.E.U.U. estuvieran organizadas en cuadrículas de 55 millas, con una densidad de 160 casas y 600 personas por milla a lo largo de sus bordes, una bomba atómica mataría a lo más a 2.000 personas y solo destruiría 500 casas (en comparación con las 135.000 pérdidas y 60.000 construcciones destruidas en Hiroshima).” / As the diagram published in *Life* magazine on June 16, 1947 (p.29) expressed “if the inhabited areas of the us were organized in 55-mile grids, with a density of 160 houses and 600 people per mile along its edges, an atomic bomb would kill at most 2,000 people and only destroy 500 houses (compared to 135,000 losses and 60,000 buildings destroyed in Hiroshima).”

and club administrators to perfect a game imported from Scotland, where it was developed in narrow sandy mounds in the seaside, covered by grass that grows spontaneously. Therefore, the transference of the game from an elongated section of land (or *linksland*) to deep America forced the transference of natural geographical accidents intercontinentally. The clubs built artificial obstacles, sand pits, small lakes, meadows and groves, transforming the golf courses into a landscape that had never existed before. It should also be added that at the beginning of the collaboration between the DAEU and the AAG in 1920, golf was a sport associated with the wealthiest classes, but from the 30s its massive use was intensified thanks to the construction of public use courses in the suburbs, as a measure to “provide pastoral shelters capable of reducing the anxiety caused by the city” (Rader, 1983:67).

Now, this transfer is as simple as the game origin, as Scottish urban planner Patrick Geddes explained: “As the shepherd goes along, he knocks now and then a stone into a rabbit hole with his crook [...] Having put the stone in – it is a white one – he fishes it out again, and drives it onto another hole. He idles away his hour, and also invents the game of golf” (Geddes, 1895:525-526). According to Geddes, while primitive fields embellished specific sites, they sought to provide instances of outdoor recreation as well. From the 50s, its development in the us would determine the long-awaited professional renovation of landscape architecture, which allowed access to design areas of “conservation, recreation and planning,” slowly overcoming its role as an activity to exclusively promote the use of ornamental plants or, in other words, as a secondary branch of agriculture. And, ironically, it would be the publication of *Silent Spring* the fact that contributed to disconnect, finally, the landscape studies of its association with gardening activities until linking them to the ecological aspects of the design (FIG. 10).

Epilogue

The publication year of *Silent Spring*, there were 24 formal programs of landscape architecture teaching in the us²⁰. Sixteen had emerged in horticultural departments of agriculture colleges, those founded in 1862 to address the problems of the sector. One hundred years later, ten of their experimental stations were or had been involved in research for the development of chemical products,



with direct support from industry and/or government (FIG.11). In other words, in 1962 almost half of the academic landscape architecture programs in the us were inserted in institutions involved in the production of new fertilizers, herbicides and pesticides that would allow the grass to perpetuate its greenery.

Just one year after Carson revealed the risks involved in maintaining a false notion of landscape beauty, visible in the synthetic greenery of its coverage by deploying a simplification of the variety of nature (Carson, 1962:20), the American Association of Landscape Architects (AALA) established that their members should “exercise ownership of landscape management” (ASLA, 1963:1). For the first time the figure of the landscape architect was called to reorient the efforts to plan and design their environment appropriately. If in a scientific-industrial society like the United States, the economic boom of the postwar period had suffered the ruin of the territory, then the landscape architects were called to correct that situation: “We are uniquely trained to conjoin in and guide the creative process of conserving, shaping, and reshaping for mankind and his purposes a more livable and expressive environment” (ASLA, 1963:1).

In an immediate effort, the study programs changed their understanding of nature from an aesthetic perspective and as an exploitable resource, to an understand it as an ecological system. In 1964, the programs emphasized the management and protection of the natural environment, natural science courses, regional development and planning of recreation areas (Simo, 1999:140). And only ten years after the publication of *Silent Spring*, eight of those same sixteen programs in agricultural colleges had been transferred to new schools or departments of “environmental design”, “environmental sciences” and/or “natural resources.”²¹ (FIG. 12)

Carson’s *Silent Spring* – amplified by her death at the hands of a breast cancer just nineteen months after the book was released – was decisive for the creation of an environmental agenda in the us, which included since the creation of the Agency of Environmental Protection in 1970, to the iconic prohibition of the use of DDT in 1972. However, although the risk of pesticides was demonstrated and how undesirable was to apply greenery patterns to open spaces in disparate climates, the use of chemicals did not diminish.

FIG 8 Panfleto producido durante la Segunda Guerra Mundial que detalla cómo despiojar a un recluta con DDT: “En ambas mangas y luego tres lanzamientos antes y tres después, tanto en el cuello como en la cintura”; “Cuando se trata de altos números [de piojos], sentar al sujeto salva al operador. No olvidar la cabeza y sombrero”. / Pamphlet produced during World War II detailing how to pluck the lice out of a recruit with DDT: “In both sleeves and then three pitches before and three afterwards, both in the neck and at the waist,” “When it comes to high numbers [of lice] sitting the subject saves the operator. Don't forget your head and hat.”

FIG 9 Este es uno de los tantos ejemplos de avisos publicitarios de compañías químicas promoviendo su línea de productos para el jardín y la 'aprobación' de su uso, sin representar un peligro para niños o mascotas. El aviso promocionaba también que fertilizantes, pesticidas y herbicidas se vendían listos para ser usados: "End-o-Pest... *Detiene* los problemas de pestes antes de que comiencen... *Frena* los problemas de pestes si es que han comenzado. Viene mezclado en un rociador con contenedor para rellenar. Usar en flores, árboles, arbustos, frutos comestibles y vegetales". En: *Life* (14 abr. 1952) / This is one of the many examples of chemical companies' advertisements to promote their line of garden products and the 'approval' of their use, not representing a threat to children or pets. The advertisement also mentioned that fertilizers, pesticides and herbicides were sold ready to be used: "End-o-Pest... *Stop* pest problems before they start... *Stop* the pest problems if they have started. It comes mixed in a sprayer with a container to fill. Use on flowers, trees, shrubs, edible fruits and vegetables." In: *Life* (Apr 14, 1952).

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10A



10B

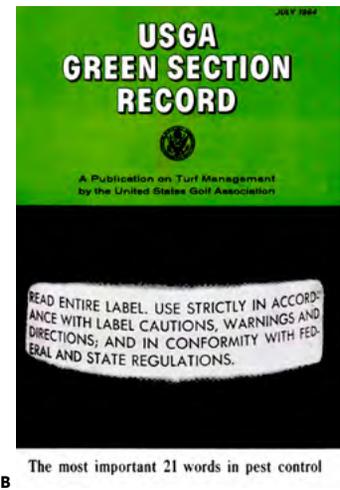


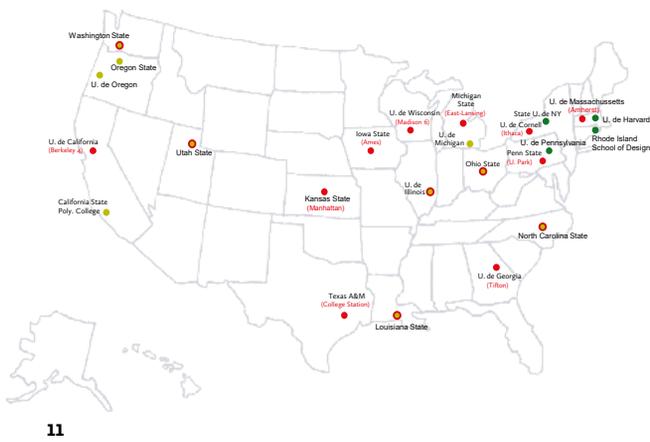
FIG 10 Dos contrastes temporales en la revista oficial de la AAG: en invierno de 1949 (izq.), 'mejor golf' significaba 'mejor césped', ofreciendo un color evaluado en su condición 'pura'. En 1964 (izq.) la portada revelaba una preocupación por el uso de químicos, asociado a una advertencia al lector acerca de "leer la etiqueta completa. Usar estrictamente de acuerdo a las precauciones, advertencias e instrucciones; y en conformidad con regulaciones federales y estatales". / Two temporal contrasts in the official magazine of the FDA: in winter 1949 (left), 'better golf' meant 'better grass' offering a color evaluated in its 'pure' condition. In 1964 (left) the cover revealed a concern about the use of chemicals, associated with a warning to the reader about "read the complete label. Use strictly according to precautions, warnings and instructions; and in compliance with federal and state regulations."

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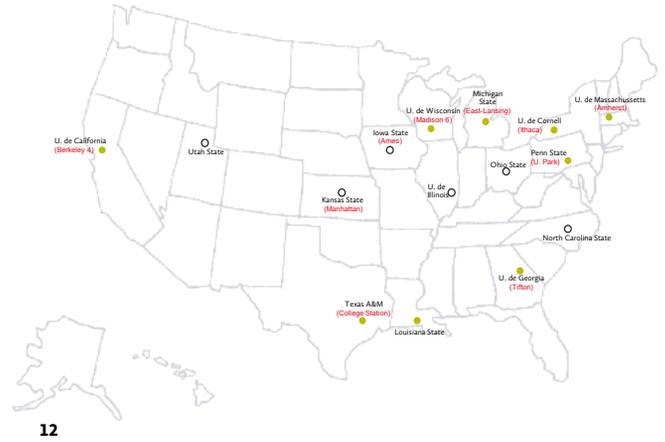
In 1992 the production in the us increased by 400 %, equivalent to the application of 500,000 tons, maintaining the 1962 per capita use of 1.8 kg.²² And, in fact, the idea of landscape as a manipulated version of green beauty also did not disappear. Quite the contrary, Carson's questioning of mankind's attitudes motivated President Lyndon Johnson (1963-1969) to declare that "the beauty of America is in danger," thus beginning a national beautification campaign, based on trees and flowers plantation, the suppression of scrap accumulation sites along the roads, the expansion of the system of national parks and wildlife refuges, and the increase of investment to create and promote instances of outdoor recreation.²³

As a result, it is possible to affirm that Carson's attack on greenery offered a new opportunity for those who hoped to reinstate the notion of nature as a place separated from the human being, as a pristine and immaculate state that should be preserved as such for generations to come. In fact, both the house where Carson grew up in Springdale, Pennsylvania, and the one where she died, in the suburb of Silver Spring in Maryland, Virginia, are inscribed on a list equivalent to our National Monuments. But, ironically, most of the land surrounding her cabin in Southport, the same one registered by the CBS, was sold as part of a real estate development operation.²⁴ **ARQ**

Architect and Master of Architecture, Pontificia Universidad Católica de Chile, 1998; PhD in History and Theory of Architecture, Princeton University, 2009. She has been a resident researcher at Dumbarton Oaks Research Library, Washington, DC (2015, 2017-2018) and guest lecturer at several universities, such as Catholic of Lima (2017), National de Rosario (2016) and Harvard (2012). Her essays have been published in *Studies in the History of Gardens & Designed Landscapes* (UK), *Harvard Design Magazine* (US), *New Architecture* (China), and *ARQ*, *Trace* and *Revista 180* (Chile) magazines. In her publications, undergraduate and postgraduate courses and workshops, as well as in the direction of research and Fondecyt projects, Hecht has developed a fundamental work in the theoretical and methodological field for the development of landscape studies in Latin America. She is currently Professor of the UC School of Architecture and prepares a book that discusses the nature of the landscape of Santiago, addressing how it was configured and who oversaw its development and transformation.



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Notas / Notes

- 1 This article corresponds to an excerpt from the author's dissertation to fulfill the requirements for the Ph.D degree in History and Theory of Architecture, "The Attack on Greenery: Critical Perceptions of the American Man-Made Landscape, 1955-1969," School of Architecture, Princeton University, 2009.
- 2 Conducted by Eric Sevareid and Jay L. McMullen and produced by McMullen and Fred W. Friendly, CBS (7:30 pm to 8:30 pm). Available at Archive.org (Nov 3, 2014), <https://archive.org/details/SilentSpringRachelCarson> (Jul 7, 2019). Also consider as interpretations of the program scope to Freeman (ed.): 445, Lear: 446-452, Murphy: 41-43, 115-116 and Sterling: 180-183.
- 3 Specifically, I am referring to the nuclear bombardment of Hiroshima and Nagasaki on August 6 and 9, 1945 and the 'Baby Tooth Survey,' developed between 1958-1978 by the St. Louis Citizens' Committee for Nuclear Information and which concluded that, in the teeth of children born between 1945 and 1965, the levels of Strontium-90 (secondary product of nuclear detonations) had risen in connection with the development of atomic tests. See details of the events and their consequences in Buell and Dunlap.
- 4 Here Carson refers to the ecology definition of German zoologist Ernst Haeckel, who in 1866 introduced the term to explain the relationships between plants, animals and their habitat. In 1953 the ecologist Eugene Odum established that ecosystems, or groups formed by organisms and their environment, were self-regulated units and directly affected by the actions of man.
- 5 "A Fable for Tomorrow," *Silent Spring*: 1-3. On the evolution of the chapter see Lear: 392-393 and Ovarec.
- 6 'Green Meadows' did not exist as a formal settlement at that time. The search engine "Geographic Names Information System" states that today there are 22 sites with that name inhabited in the US, being 1979 the year of the first entry. See United States Geographic System (Oct. 1, 2014), US Department of Interior, US Geological Survey, <http://geonames.usgs.gov/pls/gnispublic/> (Jul 7, 2019).
- 7 Both Lear and Ovarec have established that, in its final version, Carson omitted references to specific places to avoid a public alert, in addition to making it clear that the aforementioned town did not exist, and that the events described were unlikely.
- 8 Consequently, *Silent Spring* was a criticism of the way in which the American government had promoted, since the 40s, the role of science and industry. According to Thomas Schaub in his unpublished essay, "Empire and Ecology in Rachel Carson's *Silent Spring*" (1996), the labeling of pesticides as fertilizers allowed their manufacturers to assume a key role in scientific research efforts, becoming the main financiers of chemists' studies in universities.
- 9 Carson's marine trilogy included *Under the Sea Wind: A Naturalist's Picture of Ocean Life* (New York, Simon and Schuster, 1941), *The Sea Around Us* (New York: Oxford University Press, 1951) and *The Edge of the Sea* (Boston: Houghton Mifflin Company, 1955). In 1958 Carson had already published 26 articles in specialized magazines and an equivalent number of chronicles in national newspapers, along with publishing two series of specialized newsletters for The United States Fish and Wildlife Service. See Hecht, "Appendix A.1 'Rachel Carson's Timeline."

FIG 11 1962: Programas formales de Arquitectura del Paisaje en EE.UU. y los que surgieron en *colleges* de agricultura (1862) con estaciones de experimentación involucradas en investigación de césped. 1962: Formal Landscape Architecture programs in the US and those that emerged in colleges of agriculture (1862) with experimental stations involved in turf research.

FIG 12 1962-1972: Programas formales de Arquitectura del Paisaje en EE.UU. que surgieron en *colleges* de agricultura (1862) y que se trasladaron a departamentos vinculados a temas 'medioambientales' o departamentos de Arquitectura o equivalentes. 1962-1972: Formal Landscape Architecture programs in the US that emerged in colleges of agriculture (1862) and moved to departments related to 'environmental' issues or architecture departments or equivalents.

- 10 Details about the appearance of insects in the country and the chemical campaigns developed against them in *Agency for Toxic Substances and Disease Registry* (June 25, 2019), www.atsdr.cdc.gov (July 7, 2019); Dunlap, USDA, 1953, Russell and Winston. Specifically, Carson describes the operations in the chapters "Needless Havoc", "And No Birds Sing", "Rivers of Death" and "Indiscriminately from the Skies": 84-172.
- 11 The CBS decision also sought to shield Carson from further attacks. A massive campaign of discredit against her had begun only days after the first publication in *The New Yorker* (justified, in part, because they did not list the 569 "main sources" that the book did add), and that included not only lawsuits threats against the publisher, but also parodies, criticisms and negative opinion columns in media that ranged from the specialized *Chemical & Engineering News* to *Time Magazine*.
- 12 At the time of his death, White-Stevens (1912-1978) was the director of the National Office of Conservation and Environmental Science, Assistant Director of the Experimental Station of Agriculture of New Jersey and Professor of Biology of the University of Rutgers. His relationship with Cyanamid had begun in 1952 and at the time the program aired, he was in charge of interpreting data for the development of new products and "an extension program to promote a better public understanding of agricultural chemicals [...] and thus diminish the harmful effects of advertising from the opposition [...]." See White-Stevens, "Biographical Information Sheet" (1972), Special Collections and University Archives, Rutgers University, New Jersey. The other program participants were, in order of appearance: Luther Terry, US Surgeon General; George Larrick, member of the US Food and Drug Administration (FDA); Wayland J. Hayes, toxicologist of the National Health Service (NHS); John L. Buckley, Director of the Patuxent Wildlife Research Center; H. Page Nicholson, member of the Center for Pesticide and Pollution Studies of the SNS; James Hartgering, member of the Presidential Scientific Committee; and Arnold J. Lehman, Director of the Pharmacology Division of the FDA.
- 13 It would be important to consider that feminist studies have argued that the controversy between Carson and the scientific community was the result of her gender and marital status. For those interested in this interpretation line that articulates gender, ideology and ecological thinking see Briggs, Hynes, Smith and Hazlett.
- 14 Specifically, the total production was 317,378.1 tons, 8% more than in 1960 and 56% more than in 1947, with sales equivalent to 302.9 million dollars, 15% more than 1960 and 76% more than 1947. See Parsons: 61.
- 15 It would not be less important to consider, for example, that former US Vice President Al Gore (1993-2001) has never been accused of being 'air-lover' or 'sentimentalist', even though he has made accusations equivalent to Carson's against the main causes of global warming. It would be equally interesting to compare the amount of articles against both, financed by the same chemical companies whose products today cause the decrease of the ozone layer, the main reason for the accumulation of the so-called greenhouse effect, acid rain and toxic waste, all factors that led to 2012 being the hottest year in the US since the beginning of the official temperature record in 1895.
- 16 The pesticide tolerance index corresponds to "the maximum amount allowed by law to remain in agricultural products, processed foods or fodder without causing harm to humans (with a daily exposure for life, within the limits of certainty)." See Hays: 144.
- 17 According to Jenkins, the fact that presidents William Taft (1909-1913) and Woodrow Wilson (1913-1921) were avid golfers contributed to this alliance and to the importance that the turf took in the investigations of the USDA. About the FDA see *United States Golf Association* (2019), <http://www.usga.org/home/index.html> (Jul 9, 2019).
- 18 The DDT use during the War was authorized despite experiments carried out with animals by the FDA in 1943, which demonstrated that the compound produced muscle paralysis and, in certain cases, death. Despite the above, its success in controlling the typhus epidemic in Naples between 1943-1944 (where three million individuals were sprayed) and its convenient price (15 times lower than other insecticides) paved the way to allow domestic use. Among the companies involved in the production of DDT as a war arsenal are Union Carbide, DuPont, Dow, Allied Chemical, American Cyanamid, Monsanto, Olin-Mathieson, Hercules, Shell and Standard Oil.
- 19 See the pamphlet "Research and Development of Agricultural Chemicals [nd]," RCP C.76, c.1356. The estimated cost per product at that time was \$2,325 million, with \$250,000 allocated for testing.
- 20 That is, those founded in 1862. By "formal" I mean programs accredited by the American Society of Landscape Architects.
- 21 Louisiana State University, North Carolina State University and Utah State University also changed the focus of their teaching to environmental issues. It should be noted that in 1972, none of the remaining eight programs remained in agriculture departments, but had been transferred to schools of art, design or architecture.

- 22 In 1992, approximately 25,000 pesticides were registered with more than 750 active ingredients. Only 2% of the nearly 19,000 that had been synthesized after the postwar period had been re-enrolled in 1972, the approval date of the Federal Decree for the Control of Environmental Pesticides that established a standard of "unreasonable adverse effect" for such registration and a maximum term of 5 years for its execution. See *Thirty Years After Silent Spring: Status of EPA's Review of Older Pesticides. Hearing July 23, 1992, 102nd Cong., 2nd Ses., HR* (Washington, DC: Government Printing Office, 1993): 11.
- 23 "Beauty for America" was the iconic phrase of Johnson's first presidential speech on Feb. 8, 1965. In relation to the campaign and its consequences, see, in the author's doctoral thesis, the chapter "The Road is not the Enemy (but rather a Means for Understanding the American Landscape)."
- 24 Carson lived in Springdale until 1930. Her Maryland house was built in 1956 and until her death she alternated seasons in her Maine cottage, built between 1952-1953. About her efforts to protect Southport's coast from real estate agents see her letter to Judge Curtis Bok (12 Dec. 1956), *RCP* C.102 ("General Correspondence"), c.1927. Even though Carson did not achieve her goal, it is to be imagined that she expected better results in the rest of the peninsula by bequeathing two thirds of his property to The Nature Conservancy Foundation and the Sierra Club. See Lear: 477.

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