

**EDITORIAL****From dissemination to Citizen Science****Enrico Alleva and Simone Macrì***Centro di Riferimento per le Scienze Comportamentali e la Salute Mentale, Istituto Superiore di Sanità, Rome, Italy*

Since the early 1980s, the European Union (now European Commission) launched several funding initiatives, Framework Programmes (FP) 1 through 7 and now Horizon 2020, aimed at fostering scientific cooperation across the European Research Area. Our generations (EA was born in 1953 and SM in 1976), albeit in different times and modalities, resolutely believed that scientific activities shall represent the natural companion of the European Commission when it comes to generating knowledge and professional opportunities (<http://scienzaesocieta.gruppi.ilcannocchiale.it/?t=post&pid=1825779>). It is thus worth emphasizing the importance of conducting research in an Institution traditionally active in calibrating the needs of the subsequent FPs. For example, Amilcare Carpi de Resmini, who then became the Director of the Laboratory of Organ and System Pathophysiology of the Istituto Superiore di Sanità (Italian National Institute of Health, ISS), actively contributed to the shaping and general formatting of the first FP, the official starting of European science, back in 1983.

Upon launching FP1, the European Commission strived to integrate those countries that were scarcely represented in science in order to favour a wide dissemination and sharing of resources. The inclusive nature of these funding initiatives, originally pertaining to resource-sharing among scientists, has taken a different form when decision makers realised that science shall be widely disseminated rather than being exclusively entrained within the specialist scientific community. Specifically, notwithstanding the steady increase in available funds between FP2 through FP4 (1987-1998), and at variance with North America (particularly US), science was still perceived by the lay public (taxpayers) as distant from daily lives and expectations. Science was seen as something produced and conducted by “wizard alchemists” and only intelligible to those inhabiting an “Ivory tower”. Thus, the subsequent FPs explicitly devoted considerable resources to guarantee that science be disseminated to the general public in a rapid, efficient and intelligible fashion. The simplest dissemination practice has taken the form of thematic websites in which funded

projects' leaders were requested to describe the goals, methodologies and general impact of their scientific endeavours (e.g. <http://matrics-project.eu>; <http://www.h2020awe.eu>; <http://www.heals-eu.eu>). Such continuing effort towards increasing science transparency, availability and dissemination to the European citizenship was a pleasant and very welcome responsibility.

Horizon 2020 programme, the present and future of European research, is now taking laymen involvement in science a step beyond: Citizen Science, herein defined as an effort to extend the role of the general public through a transition from passive recipients of knowledge to active participants in data collection and generation of knowledge. In the *Oxford English Dictionary*, Citizen Science is defined as “scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions”. Numerous scientists have exploited this involvement when it came to collect vast amounts of data without the need to resort to a specific education in a given scientific field. This approach was adopted in several studies ranging from astronomy (<http://www.citizensky.org/>), to ornithology (<http://www.birdcam.it>), and environmental monitoring [1] (<http://engineering.nyu.edu/news/2012/10/15/brooklyn-atlantis-robot-captures-life-litter-gowanus-help-citizen-scientists>). The general public has been involved also in studies in which laymen simply offered computational capacity through their home computers [2]. Recent efforts broadened the potentials offered by Citizen Science by requesting public participation in the observation of dog behaviours in the field of applied ethology [3-7]. Dogs, in particular, owing to their progressive gathering within the ever-growing boundaries of the urban settings, represent a natural test-bed of data collection by interested and motivated citizens.

All these examples concur to indicate that Citizen Science constitutes a crucial tool to deepen the mutual exchange between scientists and the general public in the constant strive to integrate scientific endeavours in the daily lives of European citizens.

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