

**An American Utopia:
Adriano Buzzati-Traverso (1913-1983) and the
International Laboratory of Genetics and Biophysics in Naples**

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The Project

In a monographic issue of *Studies in History and Philosophy of Biological and Biomedical Sciences* (33, 2002) dedicated to molecular biology in postwar Europe, Bruno J. Strasser re-examined and compared the institutionalization of molecular biology in four European local contexts (Cologne, Cambridge, Paris and Geneva), examining how the new field was construed and how it was legitimized and acquired its broader meaning. From this comparative approach, five common themes stand out:

- 1) the role of physics in the atomic age
- 2) the relationship between fundamental research and medical applications
- 3) the “Americanisation” of scientific research
- 4) the value of science in the reconstruction of national identities
- 5) the drive towards interdisciplinary research

The aim of my current research project is to supplement this comprehensive European framework—the “global” picture, to use the expression coined by Soraya de Chadarevian and

Bruno J. Strasser—with the inclusion of the Italian case and in particular with the reconstruction of the complex scientific, ideological and political patterns leading to the founding of the International Laboratory of Genetics and Biophysics (ILGB) in Naples, headed by the Italian geneticist Adriano Buzzati-Traverso (1913-1983) between 1962 and 1969.

The research is based on a wide spectrum of sources, including Buzzati's personal papers (Università di Roma La Sapienza, Sezione di Storia della Medicina), the Alexander Hollander Papers (University of Tennessee), the Unesco archives (Paris), CERN archives (Geneva), the European Union Archives (Fiesole) and several archival collections at the American Philosophical Society (Wright Papers, Dobzhansky Papers, Luria Papers, etc.).

By adopting a methodological approach which combines science biography, institutional history and social history of science, I simultaneously follow three different perspectives. First of all, a biographical perspective, because the project analyses Buzzati's fundamental role in the development of population genetics and molecular biology in Italy from the 1940s onward, pointing out different phases of Buzzati's biography: his training in Germany during the 1930s with Timofeef-Ressovski; his American experience during the 1950s as founder of the Division of Marine Genetics at the Scripps Institution of Oceanography in La Jolla; his scientific contribution as head of the Institute of Genetics and the CNR (National Council of Research) Centre for Biophysics in Pavia during the 1950s. The aim of the project is also to reconstruct the public commitment of Buzzati, connecting his attempts to bring to Italy the "American" model of scientific research with his devastating criticism of the failures of the Italian academic system. Not surprisingly, Buzzati and the ILGB became the target of anti-American sentiments in the left-wing movements of the late 1960s.

The second perspective is characterized by a local and national dimension. From this point of view, the project considers Buzzati as a key figure in order to study the reciprocal patterns of exchange and collaboration between physicists and biologists in post-war Italy. His action as head of the Division of Biology of the CNRN (Italian Atomic Energy Commission) was instrumental in the development of radiobiology in Italy during the 1950s and in the constitution of the ILGB in the 1960s. The connections between radiobiology and molecular biology have been studied by many scholars, but the Italian case remains so far almost completely neglected.

Finally, this research implies an international perspective, which is articulated into two parallel historiographic levels. The first one concerns the involvement of American (Rockefeller Foundation, Ford Foundation, U.S. National Science Foundation, and US AEC) and European agencies (EURATOM) in the development of genetics and molecular biology in Italy, and in particular in the Buzzati projects: the Institute of Genetics in Pavia, the CNR Centre for Biophysics, the ILGB in Naples, and the *Internation Studium of Molecular Biology*. The second level is focused on international scientific cooperation, emphasizing Buzzati's action as founding member of ICRO (International Cell Research Organization, UNESCO) and EMBO (European Molecular Biology Organization). In both these contexts, Buzzati contested Kendrew's model of a supranational laboratory of molecular biology, although stressing the constitution of a federal organization. The aim of my research is to connect Buzzati's strategy in the international arena with the parallel process of organization of the International Laboratory of Genetics and Biophysics in Naples. The results of this approach could confirm John Krige's interpretation of the "difficult road" to the European Molecular Biology Laboratory.

Adriano Buzzati-Traverso and the Rockefeller Foundation

The collaboration between Adriano Buzzati-Traverso and the Division of Natural Sciences and Agriculture of the Rockefeller Foundation (RF), between 1948 and 1963, was an intense period.

In this report, I would like to focus in particular on three relevant moments of this relationship: first, Buzzati's appointment at the Scripps Institution at La Jolla, between 1954 and 1956; second, RF financial support to the "Proficiency courses on the biological action of radiation and its exploitation for agricultural and industrial aims" at the University of Pavia, between 1958 and 1961; third, the reaction of RF officers to Buzzati's project to establish an international school (or laboratory) for genetics and biophysics in Italy, between 1959 and 1962. In the Rockefeller Archive Center (RAC), the documentation concerning these three topics is available respectively in RG 1.2, Series 200D, Box 225, Folders 2168-2171; RG 1.2, Series 751, Box 9, Folders 109-112; and in the diaries of RF officers, in particular Gerard R. Pomerat, Robert S. Morison and John Z. Maier.

Buzzati received his first RF grant-in-aid in 1950 for visiting and lecturing activities in the United States. From June 9th through the 17th he attended the XV Cold Spring Harbor Symposium on Quantitative Biology. In his report on the symposium, Morison wrote a brief note: "Adriano Buzzati-Traverso, Istituto di Genetica, Università Pavia, Italy, made an excellent impression, both personal and professional." From September 1951 to February 1952, Buzzati spent a semester as a visiting professor of zoology at the University of Berkeley, substituting for Curt Stern, who was in Europe on a leave of absence. While in California in December 1951 he visited the Scripps Institution, giving seminars on the potential fruitful developments of population genetics of marine organisms and on his research at Berkeley with the paper chromatographic technique. A few weeks later, Buzzati received a letter from Roger Revelle, director of the Scripps Institution, inviting him to spend

a semester in La Jolla, working on population genetics of marine organisms and on paper chromatography applied to problems of tuna and sardine fisheries.

In August 1952, Revelle invited Warren Weaver to visit the Scripps Institution of Oceanography. There was a specific reason for urging this visit. The University of California was in fact considering the establishment of an “Institute of Marine Resources” in order to foster research, education and public service in the development of fisheries and other resources of the sea. The new institute was conceived as a university-wide organization, but with its headquarters on the La Jolla campus, parallel and closely associated with the Scripps Institution of Oceanography. This initiative implied a profound stimulation of the fundamental work in marine biology at Scripps. In order to stimulate the attention of the RF, Revelle sent to Weaver a project on the genetics of marine organisms, which Buzzati had elaborated on in August 1952: “Here is one of the dozen or so leading geneticists in the world who feels that there are many unsolved but solvable problems in marine genetics, and who is anxious to devote himself to them. Our faculty here would welcome such a colleague with open arms.”

Buzzati’s project distinguished three types of problems to be considered in the application of genetics to marine biology:

1) the study of marine organisms with the aim of gaining information of general biological significance (genetics of algae, geographic isolation, genetic systems in sessile versus free living forms, rates of evolution, mutation rate as a factor in evolution, and experimental evolution)

2) the application of genetic principles to the biological problems of the oceans (genetics and population genetics of marine forms, coral reefs, phoreactivation, and identification of larval forms)

3) possible applications of genetics in the development of marine resources, such as fisheries and marketing problems or salt water agriculture

On September 13, 1952, Buzzati informed Gerard R. Pomerat about his decision to accept a permanent position at Scripps in order to improve and develop the local program in the field of marine biology, in particular from the genetic point of view: "I realize, of course, that in this way I have to abandon my Italian plans for the development of genetic studies here. But on one hand I have lost the hopes I had two or three years ago that the financial conditions of research workers might improve within a reasonable time, and on the other hand I would leave the laboratory in good hands, capable of carrying on my efforts."

The research program which Buzzati had expanded during the 1952 semester at La Jolla constituted the embryonic form of a much more detailed project, which he prepared in June 1954, in order to apply to the RF for a grant-in-aid. Based on an "unified and effective experimental attack" to the problem of the productivity of the sea, the project included comparative biochemical and nutritional studies on phytoplankton organisms under laboratory controlled conditions, physiological and genetic studies on zooplankton forms, and experimental studies in population genetics of marine organisms. In order to implement this program and to achieve the best results, the project envisaged the introduction at Scripps of four new professorships; one visiting professorship over a period of three years; and five post-doctoral fellowships over a period of three years.

The RF accepted the proposal in September 1954 and in December of that year, provided an outright grant of one million dollars, over a period of eight years, for the development of marine biology at the Scripps Institution. As Robert G. Sproul, president of the University of California, stated in December 1954, the grant was considered "one of the most important ever to be received by the University," because of its magnitude and because it was devoted to the full-scale start of a new program of research. As part of the activities

made possible by the grant, from March 24th through March 31st, 1956, Buzzati organized a symposium on *Perspectives in Marine Biology*, published in 1958 by the University of California Press.

From July through August of 1956, the increasing budget of the Italian Atomic Energy Commission (Comitato Nazionale per le Ricerche Nucleari, CNRN) gave Buzzati—thanks to the mediation of the Italian physicist Edoardo Amaldi—the opportunity to return to Italy. On September 12, 1956, Buzzati met Pomerat in New York, remarkably revealing his delusion about the situation at Scripps:

He [Buzzati] went to La Jolla with very high hopes, but has begun to discover that he is not particularly happy there. He misses in part the high intellectual life of Pavia and Milano, but is particularly distressed by the fact that at La Jolla, Revelle gives them inspired leadership, but no real administrative attention, so that for sheer lack of good “housekeeping,” life at La Jolla is a constant series of small exasperations.

No more than ten days after this meeting, Buzzati rejoined his position at the University of Pavia, this time permanently.

Appointed in December 1956 as a member of the CNRN Commission for the Application of Radioisotopes, Buzzati—after visiting several U.S. laboratories such as the Division of Biology and Medicine of USAEC in Washington; the Division of Biology of the Oak Ridge Laboratory in Tennessee; the Blandy Experimental Farm at the University of Virginia; the Division of Biology of the Brookhaven National Laboratory and finally the Division of Biological and Medical Research of the Argonne National Laboratory—elaborated in June 1957, a five-year program of development of radiobiology in Italy, which included the organization of research groups for the investigation of the biological effects of radiations; the constitution of a “Gamma field” for studies in vegetal genetics and of a laboratory for the study of marine radioactive contamination; and the organization of a training program in genetics and radiobiology for young researchers.

As head of the Biology Division of CNRN, from October 1957, Buzzati directly implemented this radiobiological program. From 1958, eight research groups were funded by CNRN, and among them, in particular, Luca Cavalli-Sforza's research group on mutation rates and mutational loads in man at the University of Pavia, which also received important grants from the RF and the USAEC, the biochemist Enzo Boeri's research group on radiation produced free radicals at the University of Ferrara, and the microbiologist Franco Graziosi's research group in the genetics and biophysics of phages and bacteria, at the University of Rome. In 1959 the Laboratory of Vegetal Genetics was inaugurated at Casaccia, near Rome, and in 1960, the Laboratory for the Study of Marine Radioactive Contamination was founded in Fiascherino, near La Spezia.

Thanks to the CNRN funds, the Pavia Institute of Genetics grew rapidly. As Morison noted in his diary, on June 1957, "these new funds appear to make possible the realization of a dream he has long had to establish a real center for genetics in Pavia." To start with, the institute broadened its field of study, including investigations on the genetics of, and the biological effects of, radiation on bacterial viruses, bacteria, yeast molds, insects, flowering plants, human cells and man. Secondly, it enlarged its staff by offering adequate salaries and positions, Buzzati's most important collaborators in Pavia were Luca Cavalli-Sforza in bacterial and human genetics, Giovanni Magni in yeast genetics, and Renzo Scossioli in plant breeding and radiation genetics. At this stage, an attempt was made to change the pyramidal and highly hierarchic structure of Italian university institutes into a new one, patterned after the department system of American universities.

Third, in 1957, through an agreement with the CNRN, the institute became Italy's chief center for research on genetics and on the biological effects of radiation, and in advanced training in these fields as well. The new program for the specialized training of young Italian biologists represented a bold approach toward meeting the challenging need for

specialists in genetics and radiation biology and was furthermore one of the first clear attempts at postgraduate teaching in Italy. Begun in 1957 as a two-year course limited to a maximum of fifteen students with doctorates in medicine, natural sciences or agriculture, the program attracted what Buzzati defined, in a letter to Pomerat on November 5, 1957, “a really exceptional group of students,” which included, among others, Corrado Baglioni, Guido Modiano, and Marco A. Bacciagaluppi. On April 21, 1958, Pomerat listed the names and background of each participant in his diary and commented in regard to them, “They are a most attractive lot and (...) they are likely to become very interesting young investigators.” To meet the needs of this specialized training program and to undertake as promptly as possible research in radiation genetics, it was necessary for the Institute of Pavia to increase its staff and to obtain from special sources enough additional salary to attract truly distinguished young investigators. It was still necessary to bring to the institute, on temporary appointments, specialists in radiation biology and in plant and animal breeding that were not available among Italian scientists. Furthermore, the new program required expansion of the institute’s library facilities, a substantial increase in its research equipment, and a more stable provision for one or two student fellowships and research assistantships.

Beginning on April 1, 1958, an RF grant of \$80,000 provided funds for the salaries of temporary visiting lecturers, of two research assistants, and two scholarships at the postgraduate level. It was also instrumental in building up the institute’s library of books and scientific journals and for the purchase of essential additional research equipment. Through the RF grant, between April 1958 and March 1960, several visiting professors visited the Pavia Institute, giving lessons and seminars in the radiobiological courses. It is certainly worth mentioning the following among them: Doerman, Kirby-Smith, Upton, Gustaffson, Errera, Slominski, Nilan, Fisher, Verly, Bonnier, Campbell, Darlington, Dobzhansky, Lederberg, Luria, and Mather. On January 26, 1959, in his diary, Pomerat described

enthusiastically the situation of Buzzati's laboratory in Pavia, "The place is indeed bursting at the seams."

The organization of the Pavia courses was seminal in the development of Buzzati's proposal to establish an international laboratory in genetics and biophysics. In fact, according to Buzzati's autobiographical reconstruction, the first suggestion for developing a more permanent and encompassing group of scientific activities and for transforming the Institute of Genetics into an international center for advanced training in "modern biology" (i.e., molecular biology) in Europe, came from foreign guests invited to giving courses and seminars in Pavia.

The constitution of the International Laboratory of Genetics and Biophysics (ILGB), founded in December 1961 in Naples, was the result of complex negotiations, which may be articulated in two different phases. During the first one, between February through March of 1959 and July 1960, the project, named "International School of Genetics and Biophysics" (ISGB), was conceived in Pavia and structured on an international agreement of exchange and collaboration with the new School of Science and Engineering of the University of California, in La Jolla. The Italian scientific staff was constituted, at this stage, by Buzzati's group in Pavia and by the CNRN research group in Ferrara, headed by the outstanding biochemist (and RF fellow) Enzo Boeri.

Between July and October 1960, several different factors—the government crisis, the promulgation of the first preliminary "Nuclear law," the development of the National Research Council under the direction of Giovanni Polvani, and the untimely death of Enzo Boeri—led to a complete redefinition of Buzzati's project. The new proposal rested primarily on three elements: the financial and organizational agreement between CNR, CNEN (as CNRN was renamed in 1960) and Euratom; the move of the laboratory from Pavia to Naples, motivated by the possible cooperation with the Naples Zoological Station and the local

physicists and chemists actively interested in biology; and the transfer to Naples of Buzzati's genetics group in Pavia, Boeri's biochemistry group in Ferrara and Graziosi's biophysics group in Rome.

The RF strictly followed Buzzati's "pilot experiment" in the field of molecular biology. The genesis of the project was significantly described in John Z. Maier's diary, on January 26, 1959:

At lunch, Cavalli [Cavalli-Sforza] observed what a pity it was that this group, with research resources unparalleled in Italy, would have to be disbanded with the forthcoming concorso, when at least several of the staff would have to move to chairs in other universities, where facilities would be in no way comparable. We really should all stay here, he added. With this Buzzati's eye took on a speculative look as he asked questions designed to assure himself that this was what they really believed. I felt that I was witnessing the birth of an empire.

Despite the initial sympathetic approach, the RF officers ultimately decided not to support Buzzati's project. The diaries of Pomerat, Maier and Morison demonstrate that the Division of Natural Sciences and Agriculture particularly did not approve of Buzzati's decision to move the laboratory from Pavia to Naples.

First of all, the complex re-negotiation of the project—from the Pavia ISGB to the Naples ILGB—gave rise to increasing concerns among RF officers with regard to the lack of adequate financial sources for the new laboratory. Both Maier and Morison, for example, on February 1961, were forced to register Buzzati's growing difficulties in fund-raising, "I am afraid, Maier wrote on February 6:

that BT is having rather exaggerated mood swings. At our last meeting he had being notably ebullient and optimistic. Today, by contrast, he seemed somewhat depressed and indeed it was like pulling teeth to get anything out of him ... Today, BT seems quite uncertain as to what kind of help he will need, how much, and when it should begin. He appeared to be thinking much more of the development of the new laboratory at Naples, but said that he is not yet ready to submit a request for that laboratory, there being at present too many uncertainties concerning it.

Secondly, and most importantly, Pomerat was completely aware of the opposition of the University of Naples, in particular the biologists, to Buzzati's project.

Pomerat's diary, on December 7, 1960, underlined specifically this issue:

He [Pomerat] is beginning to worry more and more about the wisdom of Buzzati's plan to move his whole group to Naples. The physicists may be very sympathetic, but the biologists are not. B. may well get outside money to build a big International Institute of Genetics at Naples, but so far neither he or any of his staff have any permanent appointment in the University of Naples and are unlikely to get one as long as the biologists are unsympathetic.

Thirdly, Pomerat and Maier noticed during their visits and meetings that not all of Buzzati's collaborators actually shared his decision to leave Pavia and move to Naples, "One gathers, Maier wrote on May 20, 1961 that, "there is considerable uncertainty about the move among the members of the group at Pavia."

The reluctance of Cavalli-Sforza was revealing: "Buzzati is, of course, pressing him very strongly to go to Naples. This move still remains a possibility, although it is clear that he is not at all anxious to pull up stakes and move there, and, in fact, is just as much mystified by the plan as we are." Even the antagonism between Buzzati and other Italian geneticists was accurately documented in the diaries: Maier noted on May 19, 1961 that Ceppellini "is even more bearish than Cavalli about the prospects for the Buzzatti group and the reasons for moving to Naples. His principal worry is that Buzzatti will monopolize all the extra research money available from the CNR and the CNEN, leaving everybody else out in the cold."

Without the financial support of the RF, the International Laboratory of Genetics and Biophysics was formally established in Naples in December 1961 and began its activities in March 1962. On May 16, 1963, Pomerat visited the ILGB and reported extensively on his diary, with a very positive final impression:

B-T project has gotten off to a good start and promises well for the future. B-T has succeeded in obtaining an enormous amount of equipment, all of it brand new, and has even assembled an excellent library starting from scratch ... His people are a rather heterogeneous lot and it remains to be seen whether they will get along well together, but at the moment they seem to and they are enthusiastic about helping each other to get started.

However, on May 17, talking with Alfonso Maria Liquori, head of CNR National Center for the Study of Macromolecules in Naples, Pomerat received a very different picture of the Italian situation: Liquori in fact pointed out:

How very difficult it is to start anything new in Naples, where people are extremely jealous, where they are quick to accuse one of empire building, and where they resent anything unusual. Lots of people don't like Buzzati's high pressure methods and many resent the fact that he has been able to get relatively tremendous amounts of support.

Not surprisingly Buzzati's "empire" would collapse a few years later, in 1968-1969, under a converging institutional and political-ideological attack.

First, the laboratory was suffocated by the rigid and bureaucratic systems of administrative control implemented by the CNR, which became at the time, the mouthpiece of University opposition to the ILGB; second, it was overwhelmed by political and union turmoil, which ended up with the Maoist anti-American occupation of the laboratory, between May 4th and June 11th of 1969. In a sense, Pomerat's and Morison's pessimistic perspective with regard to the success of the Naples experiment proved to be dramatically farsighted.

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