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Disparity between Investment and Achievement at Secondary Schools of Rupandehi, Nepal

By Bishnu Prasad Pokharel

Abstract- Five schools: Sainamaina Secondary School, Janakalyan Secondary School, Parroha Secondary School, Durga Bhawani Secondary School and Paschim Parroha Secondary School, Rupandehi, Nepal have been purposively selected and studied to find out the disparity between investment at schools and rate of return from the schools in the form of achievement level. This study reveals that there exists a gap between investment and achievement. The findings showed the grim picture of the rate of return. Competitive doing, motivating working condition, and cooperative and academic principal make the schools worth. The existing disparity between funding and achievement at Secondary Schools can be bridged up through planning and implementation.

Keywords: investment, process, rate of return, achievement, disparity, planning, implementation.

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Disparity between Investment and Achievement at Secondary Schools of Rupandehi, Nepal

Bishnu Prasad Pokharel

Abstract- Five schools: Sainamaina Secondary School, Janakalyan Secondary School, Parroha Secondary School, Durga Bhawani Secondary School and Paschim Parroha Secondary School, Rupandehi, Nepal have been purposively selected and studied to find out the disparity between investment at schools and rate of return from the schools in the form of achievement level. This study reveals that there exists a gap between investment and achievement. The findings showed the grim picture of the rate of return. Competitive doing, motivating working condition, and cooperative and academic principal make the schools worth. The existing disparity between funding and achievement at Secondary Schools can be bridged up through planning and implementation.

Keywords: investment, process, rate of return, achievement, disparity, planning, implementation.

I. INTRODUCTION

This paper presents the existing strategies and ratio of investment and the level of achievement at the secondary schools of Sainamaina Municipality, Rupandehi. Investment is the total physical and monetary expenditure allocated for the sake of effective achievement. The techniques of teaching and evaluation, administrative mechanism, evaluation, and evaluation system perform principal role in the determination of achievement. The strategies adopted for academic improvement have all failed to satisfy the people's demand. The satisfaction of the guardian is the prime quality marker in which most of the schools are unsuccessful. However, the schools under study failed to get the social recognition.

This paper observes five government-aided schools through purposive sampling to find out the difference between the outlay and the output achieved. It points out the effort that has been made so far to encompass the overall upliftment of the school level education. Since the time school education started in Nepal, there has been an intensive effort from the side of the government to make school-level education fruitful and productive. Much effort has been made to make the endowment goal-oriented and cost-effective. However, the level of achievement did not increase according to the target of the government.

Rupandehi lies in the western part of Nepal. It has one Sub-Metropolitan Municipality, five Municipalities and Nine Rural Municipalities. Among

them, Sainamaina Municipality lies in the western part of Rupandehi. The researcher selected Sainamaina Secondary School Sainamaina-1, Janakalyan Secondary School Sainamaina-6, Parroha Secondary School Sainamaina-4, Durga Bhawani Secondary School Sainamaina-1, and Paschim Parroha Secondary School Sainamaina-5, Rupandehi purposively to analyze the disparity between government backing and achievement of government-aided schools.

Students have to be aware of the culture in which they belong. Erosion of culture degrades the feeling of nationality and then demotivates learning. By focusing on not only the result of the students but also the result of the schools, the internal research wing has to work continuously. The information desks of the institution have to function well, providing the right information not only the fact of the school but also the importance of culture and cultural values of the locality.

II. INVESTMENT, LEARNING AND ACHIEVEMENT

Funding should bring the desired outcome, which, is possible to achieve through planning and implementation. As an individual decides for enrollment, he assumes for the expected benefits and costs involved after getting admission. It is the case about physical and human resource backing in schooling. Endowment should bring about a positive result, which is possible to achieve through the implementation of the innovative techniques. Jones (2010, p.3) defines funding, "The field of investments, therefore, involves the study of investment process. Investment is concerned with the management of an investor's wealth, which is the sum of current income and the present value of all future income". The process of funding decides the result of the endowment. It requires return, which is possible only when processing is accomplished through a planning.

The baking process needs to assume the expected outcome from the target school. Mayo (2003, p.6) states the purpose of endowment, "An investment is made because the investor anticipates a return. The total return of an investment is what the investor earns. This may be in the form of income, such as dividends and interests, or the form of capital gains, or appreciation if the asset's price rises". The rate of return

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after funding is the primary requirement because the wealth transfers from one sector to the next. Whether it is in school education or any other company, investment demands high or at least an average rate of return.

The learning environment, virtual classroom, the principal of the school, and maximum utilization of the resources are the primary factors that determine the improvement of the achievement level of school. Learning with curiosity brings a permanent change in learners. De Simone and Werner (2012, p.56) define learning "as a relatively permanent change in behavior". Highlighting the importance of human resource development, they maintain that "employees must also use it on the job to improve performance" (76). Cooperation between students and teachers gears up learning.

Virtual classroom stimulates learners for the improvement of the achievement level of students. For the desired result or outcome, "Virtual classrooms, as the name suggests, are the classrooms functioning in a system of virtual reality" and further assert, "A virtual classroom tries to stimulate, in every way it can, the learning platform provided by a conventional classroom" (Mangal and Mangal 774, 2012). This type of classroom replaces the conventional chalk and talk tutorial period by the technology friendly classroom. They argue, "Virtual classrooms, capable of replacing partially or totally the conventional, evaluative and administrative functioning of a regular classroom by adopting the advanced communication and ICT technologies like the internet, email, online chatting, www, LD, ROMs, DVDs teleconferencing and video conferencing" (774). For virtual classroom, study materials are prepared by the subject experts so as to make the teachers easy to deliver in the session.

The principal of the school is a leader who has the tactfulness to lead school in an organizational system. He has a significant role in increasing the rate of return in the form of achievement. De Simone and Werner (2012, p.494) define that "The role of a leader is critical to organizational learning". The success and failure of the school lie in the performance of the leader.

For successful completion of the agenda, there has to be a commitment for the maximum utilization of resources. Cialdini, R.B. (1993, p. 58) writes about the strategies of asset mobilization, "Each of the strategies is intended to get us to take some action". Hansen's (1971, p. 174) links investment in school education with the economic benefit, "The cost of schooling and the money returns resulting from endowment in schooling are currently receiving more and more attention by economists". The cost of education and the benefit from it is the recent debate that stimulates the internal analysis of the funding and fulfillment. Sharma (1994, p. 115) points out that utilization of the resources helps to achieve a goal. He asserts that, "One of the important tasks in addition to achieving better use of country's

educational resources, is to make external assistance for education more efficient and more effective". Educational resources that are available in the community need maximize utilization for the maximum rate of return.

Achievement refers to the accomplishment or performance obtained based on predefined criteria. This type of achievement test measures the extent to which an institution has mastered certain aspects. This test has to be officially recognized. The governing body has to set the level of the target that they expect from the concerned stakeholders for the desired outcome. Thomas (1936, p. 208-209) presents about teaching, "Effective instruction in English demands from the teacher a sensitive and intelligent response to the changing ideas of the world. He should especially alert and intelligent in his appraisal of new movements, new procedures and new techniques in the field of education". Townsend (1994, p.68) presents the view that children's background does not play important position of the performance at school. He believes that "The role of effective schools is related to the success of all the children in the school, regardless of their background". Discussing the importance of effective classroom, Good and Brophy (1997, p.132) contend that the effective management of a session "begins with advanced planning, in which the teacher thinks through the intended curriculum and its implication about the kind of learning environment that will be needed to support it". Use of resource and encouragement to teachers to utilize leads to the effective benefit of the investment. Hence, time management by teachers, teachers' attitude to the subject and profession, students' opportunity to learn, test items, and classroom tasks are given to students directly or indirectly affect students' success. Teachers have to be aware of the fact that students having high track need thinking tasks whereas students having weak intelligence level need memory tasks.

The successful principal of school envisions a definite mental picture in their mind for the future of the institution. He has to share mental picture with others for justification and verification. They play a vital role in minimizing the gap between funding and achievement. Holmes (1936) examines the value of administration: "Intensive training in administration asserting that all administrative officers in schools should work in the system". When an institution embraces a compromise view about an administrative leader, it moves on compromise throughout its life. For the effective functioning of an institution, a compromise view should be discarded. An administrator has to have the feeling of risk manager for the introduction and implementation of a new policy and other managerial tasks. The intervention is required to break the continuation. Implementation of the recent technique is possible only through the principal, who is ready for risk management.

The risk manager has to depend on predetermined performance standards of different responsibilities that the person assumes. For Greene and Serbein (1978, p.18), "The field of risk management, like all professional fields, is not static. The risk manager has the responsibility to keep abreast of new developments in his field, to evaluate these developments and to implement ideas and procedures that will enhance his department". For the intervention and introduction of the new system in the school, the principal has to play an instrumental role as a risk bearer and manager.

III. METHODOLOGY

The researcher collected the data from the five schools of Rupandehi purposively. Each school has distinct nature so far as the background of the students is concerned. A large number of Dalit and indigenous students study at these schools. The researcher visited the schools, observed the written documents, interviewed the students individually and in the group, took interview of ten teachers one by one, interviewed ten guardians of bright, average and weak students and discussed with principal and the members of the management committee. Finally, the researcher showed the result of the schools to the concerned authority. He used both primary and secondary data. Following were the secondary sources for study. Beare, H., and Slaughter, R. (1993). Cialdini, R.B. (1993). De Simone, R.L., and Werner, J.M. (2012). Good, T.L., and Brophy, J.E. (1997). Greene, M.R., and Serbin, O.N. (1978). Hansen, W.L. (1971) Jones, C.P. (2010). Mangal, S.K, and Mangal, U (2012) Thomas, C.S. (1936), and Townsend, T. (1994).

IV. ANALYSIS AND INTERPRETATION

Physical infrastructure, teachers and community participation are the key concerns of endowment. Physical infrastructure refers to the visible corporal structure at the school. It encompasses the land that the school owns, playground that students can use daily, classrooms, furniture, electricity and computer. Along with these, the use of electronic devices in teaching, and learning activities in the session fall within this criteria.

Not all students carry food from home to eat during the Tiffin time. The school has to manage cafeteria within the school premises. Fresh and hygienic food in the canteen is the prerequisite for quality. Pure drinking water is the fundamental requirement that affects the health and hygiene of the students. Once the students feel mentally tired reading the books, listening to the lectures of the teachers and practicing the classroom tasks, they need to refresh themselves, which is possible only through games. Sports materials like volleyball, football, cricket chess, and ring are play materials for the students. Sanitary management gears learning. When students do not find a clean toilet with

soap and the management of sanitary pads for girls, they feel uneasy visiting the school. That is why restroom has to be fresh with abundant water. For science, computer and English students need a lab that makes teaching lively and practice-based. Though most of the schools have ceased to use blackboard and chalk, some of them have been using till now. The use of technology in the tutorial period is the call of the time.

The foremost stakeholder of school is a subject teacher. The success level of students differs based on the qualification of the teacher. Moreover, the teacher has to feel himself or herself secure about the job. The permanent teachers feel more secure than contract or temporary teachers. The ability of teacher to use a computer in the classroom is also significant factor making teaching effective. Teachers who are literate about the use of electronic devices in the tutorial period can visually deliver the current technological and scientific innovation that gets imprinted on the mind of the students.

Community participation is the sign of direct involvement of guardians in the school education. When the community is indifferent, the school family does not feel any supervision outside. Community participation for purchasing land and construction of infrastructure affect the learning environment. If guardians have donated, they do have an internal drive to participate in all the constructive activities of the school. Consequently, the quality of the institution improves.

Twenty-seven main criteria had been developed to find out the funding at the school, 46 criterion for classroom teaching and professional development, 15 criteria for achievement level have been designed. Every checklist deserves three full marks. Based on the checklists, schools obtain score According to the predefined criteria, the total weight-age of the investment is 25 percentages, classroom teaching and professional development deserves 30 percentages, achievement level deserves 40 percentages and the number of students deserves five percent for the determination of the quality of the school.

a) *Investment at Five Schools of Rupandehi*

Investment at school is the total expenditure for the maximum rate of return for a better performance. It encompasses land, furniture, computer, and the teachers for making the teaching and learning-friendly. The following table presents the ratio of backing to make learning effective.

Table 1: Investment

S.No.	Name of the School	Full Marks	Obtained Marks	Percentage
1	Sainamaina Secondary School	81	62	76
2	Janakalyan Secondary School	81	61	75.28
3	Parroha Secondary School	81	55	67.88
4	Durga Bhawani Secondary School	81	47	58
5	Paschim Parroha Secondary School	81	47	58

(Field Survey 2019)

The table indicates the ratio of backing at different schools. Sainamaina Secondary School obtained 62 marks out of 81. The total percent is seventy-six. Janakalyan Secondary School got 61 marks out of 81. The percent is 75.28. Parroha Secondary school secured 67.88 percentages, Durga Bhawani Secondary School got 58 percentages and Paschim Parroha Secondary School got 58 percentages. In backing, the highest percentage is 76 obtained by Sainamaina Secondary school and the lowest percentage that is 58 obtained by Durga Bhawani and Paschim Parroha. All the schools crossed fifty percentages in backing. The ratio of funding is not as much as required but it is not much poor as well simply because all the schools crossed fifty percentage.

The endowment of all school is satisfactory for the reason that except Paschim Parroha Secondary all schools do have enough land. The government has invested for the infrastructure development of the schools.

b) Classroom Teaching and Professional Development at Five Schools of Rupandehi

Classroom teaching, student, teachers' professional development and visionary management committee are main factors to make instruction and learning effective. Teachers' planning to increase the total academic attainment is significant for institutional development. For the implementation of the new technique to solve a problem, action research is required. Every teacher has to accomplish at least one action research a year. Formative evaluation gives feed back to the teachers about how far their students have learned what they have taught. Strategy for professional development and yearly publication make the institution effective. The management committee has to be very conscious about the overall development of the institution. On completion of the formation of vision, mission, and goal, in every meeting quality-related agenda has to get importance.

Table 2: Classroom Teaching and Professional Development

S.No.	Name of the School	Full Marks	Obtained Marks	Percentage
1	Sainamaina Secondary School	138	109	78
2	Janakalyan Secondary School	138	93	74.03
3	Parroha Secondary School	138	68	49.26
4	Durga Bhawani Secondary School	138	48	49.26
5	Paschim Parroha Secondary School	138	85	61.56

(Field Survey 2019)

The table presented here indicates the marks got by different schools for the classroom activities and professional development. Sainamaina Secondary School obtained 109 marks out of 138. The total percent is seventy-eight. Janakalyan Secondary School obtained 93 marks out of 138. The total percent is 74.03. Parroha Secondary school got 68 marks. The percentage is 49.26. Durga Bhawani Secondary School got 48 percentages and Paschim Parroha Secondary School got 61 percentages. So far as the classroom teaching and professional development is concerned, the highest percentage is 78 got by Sainamaina Secondary school. Durga Bhawani and Parroha Secondary school got the lowest percentages that are 49.26.

Two schools got less than fifty percentage marks in tutorial activities and professional development. For effective tutorial period, the school does not need for additional backing. When the school formulates and implements the system, the percentages

improve. Processing is the significant factor that increases or decreases the achievement. For this reason, administration and inspection wing has to pay additional attention to processing.

c) Achievement Level at Five Schools of Rupandehi

The ultimate goal is the tempo of return after endowment. The rate of return determines utilization of funding. For the optimum rate of returns there have to be effective classroom activities. The regularity of students, teachers, dropout rate, repetition of course group, and attainment level of Nepali and Mathematics of class 5 and 8, and the result of SEE. Satisfaction of guardian, students and teachers are the major parameters for the determination of the achievement level of the school. The table below shows the result.

Table 3: Achievement Level

S.No.	Name of the School	Full Marks	Obtained Marks	Percentage
1	Sainamaina Secondary School	45	22	48.87
2	Janakalyan Secondary School	45	21	46.65
3	Parroha Secondary School	45	18	40
4	Durga Bhawani Secondary School	45	22	48.87
5	Paschim Parroha Secondary School	45	16	35.55

(Field Survey 2019)

The table indicates the marks got by schools for the success level. Sainamaina Secondary School obtained 22 marks out of 45. The total percent is 48.87. Janakalyan Secondary School obtained 21 marks out of 45. The total percent is 46.65. Similarly, Parroha Secondary school got 18 marks out of 45. The percentage is 40. Durga Bhawani Secondary School got 22 marks out of 45. The total percentage is 48.87, and Paschim Parroha Secondary School got 16 marks out of 45. The percentage is 35.55.

The academic level of all schools is not satisfactory. The highest percentage is 48.87 got by Sainamaina Secondary school and Durga Bhawani Secondary School and Paschim Parroha Secondary

School got the lowest percentage. None of the schools crossed 50 percentages. This is the grim picture of the government-aided schools of Sainamain, Rupandehi.

d) *Number of Students at five Schools of Rupandehi*

Sainamaina Secondary School has 610 students from grade one to twelve. Janakalyan Secondary School got 809 students in two different sectors from class one to twelve. Similarly, Parroha Secondary School has got 996 students. Durga Bhawani Secondary School has 462 students from grade one to twelve. Paschim Parroha Secondary School has got 475 students encompassing from level one to ten.

Table 4: Number of Students

S.No.	Name of the School	Full Marks	Obtained Marks	Percentage
1	Sainamaina Secondary School	5	5	100
2	Janakalyan Secondary School	5	5	100
3	Parroha Secondary School	5	5	100
4	Durga Bhawani Secondary School	5	3	60
5	Paschim Parroha Secondary School	5	4	80

(Field Survey 2019)

In the Terai region, the average students required from grade one to twelve is six hundred that is to say one class needs 50 students. Sainamaina Secondary School, Janakalyan Secondary School, and Parroha Secondary School got full marks whereas Durga Bhawani Secondary School got only 3 out of 5, and Paschim Parroha Secondary School got 4 out of 5. The number of students is satisfactory in three schools whereas the rest two schools need to increase the students.

e) *The Disparity between Investment and Achievement at Five Schools of Rupandehi.*

The ratio of funding is plausible in most of the schools. However, the academic level is very low. None

of the schools crossed fifty percent marks. The gulf between endowment and success has generated blunt criticism from the public. Without knowing, the situation people have not become negative about schools. The average rate of return can partially satisfy the people. For increasing the level of return, there has to be obligation from the major stakeholders. The rate of return at the ratio of funding is the communal demand.

Table 5: The Disparity between Investment and Achievement

S.No.	Name of the School	Obtained percentage in Investment	Obtained Percentage in Achievement	Difference
1	Sainamaina Secondary School	76	48.87	27.13
2	Janakalyan Secondary School	75.28	46.65	28.63
3	Parroha Secondary School	67.88	40	27.88
4	Durga Bhawani Secondary School	58	48.87	9.13
5	Paschim Parroha Secondary School	58	35.55	22.45

(Field Survey 2019)

The table indicates the difference in the funding and attainment level of schools. Sainamaina Secondary School has 27.13 percentage of disparity. There has not been the academic success as per the endowments. Janakalyan Secondary School has got the highest level of gap. The funding is 75.28 percentages whereas the achievement is only 46.65. The disparity is 28.63 percentage. Similarly, Parroha Secondary School has 27.88 percentage difference. Durga Bhawani Secondary School has the minimum gap between funding and academic success. The difference is of only 9.13 percentage. Paschim Parroha Secondary School has 22.45 percent difference. The table presents the grim picture of Secondary level public education. All the schools failed to meet the level of academic excellence as much as the school has invested.

The gap between endowment and achievement demotivates the investor. Then the school education system degenerates. De Simone and Werner (2012, p. 514) recommend certain actions to be taken to bridge the gap between funding and attainment. Rate of return is very little in comparison to the funding.

1. Prepare a written policy statement on equal employment opportunity
2. Designate an affirmative action officer
3. Publicize an affirmative action policy statement
4. Analyze the surrounding labor market to determine if its current labor force is representative.
5. If a projected group is weak in any area within an organization, develop goals and timetables.
6. Establish an internal auditing and reporting system of its program and activities
7. Develop support for affirmative action both inside and outside the company.

Without considering the most important factors of investment policy, the investor does not invest. The credibility becomes low when most of the significant factors are not valued during the implementation phase. The investor has to consider the significant factors during the implementation phase.

Good schools do not have many gaps between funding and achievement. Be are 1989 as cited in Be are and Slaughter (1993, p.73) discusses the features of a good school, "as having clear educational aims, which apply to the behaviors of staff no less than to students. Good schools target learning outcomes. An attitude of success permeates the whole school. Good schools are relentlessly on the search for a better way of doing things". Students and guardians develop positive thinking about good schools. Consequently, local, regional, provincial, and national people develop positive attitude about such schools.

V. FINDINGS

Till now, the ministry of education of Nepal and its wings have presented views about education

highlighting the static picture. Reformation in the structure of the school education does not guarantee quality. Along with this, cultural agenda has lost its tempo that in turn degenerates into a moral outline. We need an urgent change in education because people bluntly criticize school- activities, syllabus, curriculum and teachers. The main reason of the criticism is the disparity between sponsorships and achievement. Guardians and students have felt that the rate of return at school education is very low. The disparity in five schools ranges from 9.13 percent to 28.63 percentage. School education has to be analyzed showing in the line of economic benefit. Once, the stakeholders do not get benefit, they bluntly criticize. Clear vision having a sense of direction is the call of the time to minimize the gap.

VI. CONCLUSION

The state of return on the costs of schooling is less satisfactory than general expectation. Lack of high or average rates of return to endowment in schooling needs a debate for explanation and justification. Once the rate of return becomes low, the social faith in education deteriorates. The disparity between funding and rates of return generates dissatisfaction in public. Hence, community begins to suspect for the grant. The defective relationship between investment and academic success generates multiple questions about the need for endowment. The concentration of the stakeholders has to be on teaching, and learning. Teacher's value task to the students and they regularly involve in academic activities like learning. In every assessment, they focus on the change on achievement level. Every school has to conduct tests for students, and the test of the school to find out the challenges and plan for the better performance. Students do not have to have hesitation in expressing their skill and curiosity so that they constantly play with ideas. Once students do not have hesitation even to make mistakes, they are psychologically ready to learn.

VII. RECOMMENDATIONS

The educational institution becomes successful when investment, processing, and achievement have got internal harmony. All the five schools studied so far do have a low rate of return in comparison to the investment. The average rate of return needs improvement for which teaching-learning activities play important role. In the same way, professional development and policy level intervention need to introduce. Followings are the recommendations.

1. Classroom activities need improvement through certain objective evaluation techniques.
2. Reward policy for principal and teachers need implementation.

3. Management committee has to make at least one agenda in every meeting about quality improvement.
4. Regular subject-based training for teachers.
5. Role model school of teachers and management committee with checklist
6. Result analysis and implementation plan of every subject with academic level of students.
7. Teachers have to research related to the weaknesses/ lapses in teaching and learning. Examples: Drop out, repetition, absent and result analysis.
8. Guardian awareness program is the basic requirement to maximize regularity and minimize dropout.
9. Past three year's achievement level of schools needs analysis every year from the local Municipality and then implementation of reward policy.
10. Food and shelter support policy has to be made for the students who do not have parents.

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Social Impact of Migration: The Case of Armenia

By Arpie G. Balian

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Keywords: migration; health disorders; isolation; social problems; education.

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I. INTRODUCTION

Anush Sargsyan¹ is a young woman born in Dalarik, a village in the Armavir District of the Republic of Armenia. She is 32, completed the local high school but did not pursue higher education. Her father was killed in the Karabakh war with Azerbaijan and her two older brothers, Gor and Hakob, went to visit their uncle in the United States and did not return. Anush lives with her mother, has never held a job, and is not interested in acquiring skills and competencies that might lead to a productive career. She is content and has no issue with the way things are given the comfort and decent life the steady remittances from her brothers in the U.S. afford. She even knows the names of certain American cities and places in North Hollywood where her brothers live and work. She speaks about them with enthusiasm but is not interested in visiting them in the U.S.

Traveling through rural Armenia, one comes across similar cases that make one wonder if Anush would have strived to earn a degree and become a professional had there not been the uninterrupted flow of remittances her two brothers sent home regularly? A series of similar questions emerge that merit attention, particularly from the perspective of a small developing state that relies primarily on human capital for economic and political development. Beyond the short-term economic impact of remittances sent by migrants, are there significant longer-term social effects to consider?

Interest among social scientists to study the consequences and impact of migration has grown considerably in the recent past. More precisely,

migration outflows (whether for emigration or labor migration) have been issues of concern throughout the former Soviet Republics particularly because of large outflows since those states gained independence in the early 1990s. Migration is assumed to have a wide variety of social effects on the country of origin, although research in identifying the social impact on the source country is relatively sparse. Most studies have focused on the impact of migration on the receiving or destination country. Other studies have focused on the behavioral issues of migration, mostly of the migrants themselves, but not delving into the social problems that migration causes at home.

Hence, an examination of the social impact of migration on the community left behind may add new knowledge in the field and may invite the attention of policymakers on the issue. This study focuses on analyzing the effects of migration on the sending or home country. Considering that managing migration more effectively has become a policy debate in many post-Soviet developing countries, this study looks to measure the social impact of labor migration by way of analyzing those effects and providing relevant data for policy consideration. Such a study is particularly relevant today in view of the ongoing debate in the RA National Assembly, government and the media on migration trends. The high unemployment rate and slow-moving economy of Armenia combined with increased labor demand in the Russian Federation and in other countries have made migration a viable option for the local labor force.

II. THEORIES OF MIGRATION

Studies of migration define emigrants as those individuals or families that move to another country to establish permanent residence. In most cases, emigrants leave behind relatives (sisters, brothers, parents and grandparents, or distant family members, uncles, aunts, great uncles and great aunts, nephews, nieces, etc.) and friends. Also, there are multiple situations where emigrants have initially moved to find employment across borders and have ultimately decided to establish permanent residence. Somewhat different from emigrants and of central interest to the current study are labor migrants that are considered to be those citizens that cross their home state border for employment (at least initially). Both emigrants as well as labor migrants send home remittances to family and/or relatives and friends at home there by making a difference in the wellbeing of the home society.

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¹ While the case description is real, the names of people and places used in text are fictitious.

Considering that statistics on labor migrants are most often unreliable and difficult to track and analyze, this study uses the definition of a labor migrant used by the United Nations (UN) 1990 International Convention on the Protection of the Rights of All Migrant Workers as “a person who is to be engaged, is engaged or has been engaged in remunerated activity in a state of which he or she is not a national.” The main purpose of labor migrants is to find better-paying jobs across borders, mostly in construction and other jobs demanding skilled labor. Labor migrants also include men engaged in farming in certain months of the year and seeking seasonal work abroad in the down months.

A dominant theory that explains why people migrate, i.e., illustrating the causes and effects of migration, is neoclassical theory. In line with how these theorists posit in relation to development, here too the drivers of migration are assumed to be associated with economic considerations, unemployment, costs and benefits relative to working at home versus abroad (Todaro and Smith, 2006). Closely related to the latter is the push-pull theory of migration that sets forth push factors in terms of solutions to overcome hardships in the home country, including economic, political and social hardships. Logically, it follows that pull factors would include the advantages offered by the destination country, including better wages, living and working conditions, and political system. Narrowing down this argument to labor migration it is likely that highly qualified professionals would find more fitting opportunities and job security in developed countries as opposed to the confined labor markets of small developing countries. Whereas pull factors related to migrant laborers or unskilled workers stem from the availability of jobs and better pay (Arango 2000; Bauer and Zimmermann 1999; Czaika and De Haas 2012; Docquier et al. 2014; Kim & Cohen 2010; Lee 1966; Ruyssen et al. 2014).

While neoclassical theory places emphasis on financial drivers, such as wage differentials, the New Economics of Labor Migration (NELM) theory considers various other factors, questioning some of the elements considered in the former (Badie and Withol, 1993). The main divergence from earlier theories is that labor migration decisions in developing countries are influenced by the lack of state institutional safeguards or insurance protection from risks and market failures (Stark, 1991, 2003). Remittances are integral to NELM theory, particularly as they apply to the causes and consequences of migration (Faist 2000; Taylor 1999).

On the flip side, *World Systems theory* (Wallerstein 1974; Sassen 1988) views migration as a natural phenomenon of globalization and the existence of unequal development between the highly developed countries and the periphery. Along a parallel argument, *Dual Labor Market theory* (Piore 1979; Stalker 2000; Wallerstein 1974) regards migration as a structural

phenomenon claiming that highly developed industrial economies are designed such that they would require migrant inflows to fill those jobs that are necessary for the economy to function but are generally unwanted by the native population because of their relatively less advantageous work conditions and lower wages.

Also, whereas neoclassical theory views migrants as utility-maximizing agents for the country of origin in terms of the money and skills they would bring back, the structuralist model presents a more pessimistic, adverse observation. Papademetriou (1985: 111-112) argues that for sending countries migration contributes to the “*uncontrolled depletion of their already meager supplies of skilled manpower — and the most healthy, dynamic, and productive members of their population.*”

III. UNDERSTANDING THE SOCIAL IMPACT OF MIGRATION

Studies have shown that migration impacts the wellbeing of the household itself, as well as the home community and even the broader community in making development advances and growing the economy (Azam and Gubert 2006). In the current study, social impact of migration is analyzed in terms of the human and social consequences that occur, particularly within the context of influences that may require social services and/or corresponding policy legislation (national or regional).

a) *The Value of Remittances*

In order to understand the impact of migration on the social wellbeing of the country of origin, it is important to understand the impact of remittances sent home paying special attention to social non-pecuniary consequences of remittances. Included in this category is the “*impact on health, education, gender, care arrangements and social structures, and ethnic hierarchies in migrant communities*” (De Haas 2007). From a benefits’ perspective, De Haas argues that

“Migration leads to a ... transfer of investment capital and accelerates the exposure of traditional communities to liberal, rational and democratic ideas, modern knowledge and education. ... The general expectation was that the flow of remittances—as well as the experience, skills and knowledge that migrants would acquire abroad before returning—would greatly help developing countries in their economic take-off” (DeHaas 2007, p.3).

In contrast, a number of other scholars maintain that migration tends to augment the social effects of underdevelopment (Lipton 1981; Rhoades 1979; Hayes 1991; Rubenstein 1992; Binford 2003) and, aside from the ‘brain- drain’ effect, relatively stable village communities break down or even collapse when the

pillars of the community depart. This leads to a passive community of elders, weakening skilled workforce, and a predominantly remittance-dependent community of unemployed citizens (Adams 1969). The lack of young working hands results in underutilized farmland and underproductive agriculture.

The use of remittances for different purposes is also viewed from a socio cultural perspective as being detrimental. Lipton (1980) and Hayes (1991) argue that the regularity and aggregate amount of remittances and parcels sent home by migrants result in a sort of liking for foreign products. This further increases the feeling of dependency thereby reducing the motivation to work and decreasing community solidarity, by way of weakening the opportunities for growing human as well as social capital and undermining *"the socio cultural integrity of migrant-sending communities"* (De Haas 2007, p.5).

b) *Migration and Human Capital*

Katseli et al. (2006) look at the impact of migration predominantly through an analysis of remittances sent by labor migrants and posit that the increase in household income often leads to reduced child labor and improved educational attainment (at least in terms of high school completion). But, this is not always the case and the opposite is more often true in small states. Thus, considering that education and work experience are important contributors to human capital formation, home countries are more often disadvantaged in this respect. This is consistent with what Carling (1996, p.50) states—that *"labor emigration has the potential to affect the stock of human capital in the country of origin,"* commonly labeled as 'brain drain'.

On the other hand, Yezer and Thurston (1976) view migration as an investment from the perspective of human capital theory. Along the same argument, Stark and Wang (2001) argue that migration can induce migrants to amass a socially desirable level of human capital. As a result,

"An economy open to migration differs not only in the opportunities that workers face but also in the structure of the incentives they confront; higher prospective returns to human capital in a foreign country impinge on human capital formation decisions at home."

These authors examine the relationship between the actual and optimal formation of human capital in an economy in comparison to providing public subsidies intended for human capital formation under normal conditions, absent migration. Their study shows that in the event that a state has in place a migration policy geared toward placing some restriction or control on migration, there will be greater tendency for pushing toward the optimal formation of human capital at home. By this, the authors claim benefit from migration policies that act as catalyst for brain gain (versus brain drain).

c) *Migration, the Family Unit and Health*

As stated earlier, it is often challenging to delineate precisely what the social impact of migration is on the source country, but clearly the immediate and extended family unit are affected both positively and negatively. A 1994 RAND paper highlights that although migration may have a negative impact on families, but this may not be large (Asch, 1994, xvi). In another study by the OECD Development Center (2006, pp.5-9) Katseli et al. (2006) argue that migration may directly or indirectly affect the source state's human capital accumulation, children's education and health, as well as the social wellbeing of the family unit, especially women. Aguila et al. (2012, p.34) bring out yet another important aspect of the social impact of migration, namely, that *"social networks reduce the cost of migration for other groups of non-migrants, inducing them to migrate and thus perpetuating the process."* Migration rates may grow more rapidly in the case of labor migrants, but also show growth patterns in the case of emigrants.

Migration also affects health taking on different forms. Hildebrandt and McKenzie (2005) argue that migration might influence child birth rates or the decision of parents in different ways. *"Migration may alter the fertility decision through a number of avenues, such as changes in household income and the opportunity cost of time and changes in knowledge about contraceptive practices"* (Hildebrandt and McKenzie 2005, p.11).² For small states, such as Armenia, this may be detrimental to development. In her study, Golinowska (2008) argues that labor migration firstly causes separation of family members when the head of the household migrates for work, often causing traumatic experiences to family members left behind. More importantly, the effect of migration on health could be serious in some cases culminating in further deterioration and disabilities. Some migrants are known to carry sexually-transmitted diseases that are subsequently transmitted to spouses causing health problems (Manasyan and Poghosyan 2012).

The effect of labor migration on families is also discussed by Carling (1996) who brings forth several illustrations. In his view, remittances *"... may also facilitate marriages in societies where dowry or bride wealth are common ... Remitted earnings can also enable young couples to establish independent households earlier than what would otherwise have been possible"* (p.45). This argument is put forth as a positive force driving labor migration at the onset and probably serving as a decisive influence in some cases. But, in some conservative societies (where dowry is regarded as an advantage), labor migration of women is not always viewed as a positive standing for them, often

² The study looks exclusively at Mexico, using statistical data from 1997.

having negative effects on 'men's choice' among other so-called candidates.

IV. POST-SOVIET MIGRATION TRENDS

The collapse of the Soviet Union triggered transformations in political, economic, social and cultural arrangements, beliefs and attitudes. Though hope and despair coupled with anticipation and anxiety prevailed, 'independence' also offered new opportunities for those who quickly found their way in chaos. For the most part, however, the shift created confusion for the vast majority of the population of the Newly Independent States (NIS)³ who did not know how to function in a non- autocratic regime and hesitated to make a move.

In the case of Armenia, the pre-independence 1988 earthquake, the economic collapse following independence in 1991 and the political instability and conflict with Azerbaijan on the Nagorno-Karabakh enclave is believed to have exacerbated the effects of migration. It is assumed that migration is triggered primarily by economic factors and may fluctuate in intensity from time to time and, in spite of inflows from diasporic Armenian communities, migration outflows continue to occur at a relatively high rate.

In contrast, Georgian migration is different where more women than men migrate (Badurashvili and Nadareishvili 2012), which tends to be traumatic for the traditional Georgian society. Also, the migration experience is often challenging for Georgian women from the standpoint of the difficulties they encounter with reintegration and re-adaptation to ethnic traditions upon return home. This often incites more migration. Much like in Georgia, women are active migrants in Belarus, but this is largely in the form of urban-rural migration for better job opportunities and improved living standards (Bobrova, et al. 2012). At the same time, somewhat in line with the earlier depiction, migration impacts the family unit; urban migrants get married and have children later than the women that are left behind in rural communities.

Aside from individual decisions to migrate generally articulated in terms of solutions to economic issues, "*nationalism and separatism, territorial claims, and hegemonic ambitions have provoked ethnic conflicts, civil wars and, as a result, refugee flows and internally displaced persons*" (Tishkov et al. 2005, p.26). In the case of Armenia, the conflict with Azerbaijan has produced both internal and external migration. Internal migration flows have generally been movements away from border villages for more security. For those who have stayed, external migration has been exhibited both in terms of labor migration, as well as emigration.

V. THE CASE OF ARMENIA

Though internal migration has moved young people from rural communities to the capital Yerevan and, in much smaller numbers, to other major cities within the same district (*marz*), the current study does not consider the effects of internal migration. Rather, it tackles labor migration, which mostly involves male heads of households leaving to the Russian Federation and, to a lesser extent, to other CIS countries and Eastern Europe. This flow is dominated by 25-50 year old males who leave their families to find employment elsewhere (although many do not return).

The Social Snapshot and Poverty in Armenia (World Bank 2016) ⁴ presents data from the 2015 Integrated Living Conditions Survey (ILCS) showing that 5.3% of households and 10.3% or 130,000 of household members 15 years old and above were absent from home for at least three months in the period 2012-2015. Of the total number of absentees from home, 78.5% had migrated to other countries, of which 89.3% to the Russian Federation. Another study by the Global Knowledge Partnership on Migration and Development has reported that migration outflows as at 2013 account for 26.3% of the Armenian population (KNOMAD 2016).

In the case of Armenia, the dominant majority of migrants are males, which is mostly explained by two factors: first, males are generally considered to be heads of households, while females are considered to be the principal caretakers of the family, specifically the children. Secondly, labor migrants, especially men going to Russia for work, are primarily engaged in construction and agriculture (Manasyan and Poghosyan 2012). This trend of labor migration is consistent with the findings of a similar study on Latvia confirming that migrants' wives take care of the household and children, which also leads to an increase in household chores and other work they must do themselves. Similar to Armenia, there are cases of negative impact that lead to break up in the family, mostly as a result of the migrants' long absences, unofficial marriage abroad and need to provide for two families, or not returning home at all (Krišjāne and Lāce 2012; Manasyan and Poghosyan 2012).

VI. RESEARCH PROPOSITIONS AND METHODOLOGY

The study uses a mixed method within an explanatory design that explains (a) why migration is viewed as a negative force in Armenia; and (b) what are the non-economic social consequences and difficulties resulting from or caused by migration. Thus, the propositions considered in the study in relation to the research questions are as follows:

³ NIS includes Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

⁴ The referenced publication uses a survey based on the UN definition and methodology of international migration.

- P1: Remittances positively impact education and human capital growth in the home state.
- P2: Migration negatively affects families and especially the children left behind.
- P3: Migration negatively affects the health of family members left behind.
- P4: Despite the immediate financial advantages that remittances provide, social problems arise in the longer-term.

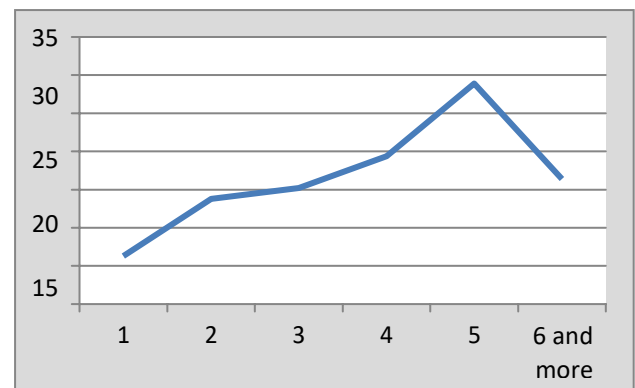
An explanatory case study approach was selected to explain 'social impact' and to fully understand the phenomenon of migration delving deep into the social effects it may have on the Republic of Armenia. The mixed method has facilitated understanding those impacts using a variety of data sources to answer the research questions and associated propositions. Data sources included government migration statistics; a survey of urban and rural households with at least one migrant worker ($n = 536$);⁵ and informal conversations with select cases from the sample surveyed ($n = 23$). The variety of sources used and the continuous process of triangulating the findings provided the opportunity to establish agreement among independent sources or to clear inconsistencies. In unusual instances, direct observations were made to supplant information where the data raised questions of insincerity or imbalance. The testing of the survey questionnaire and actual administration were conducted in June 2016 through June 2018. The length of time was dictated by the necessity to return to the target sites multiple times for data verification and supplemental data collection or validation.

VII. DATA ANALYSIS AND INTERPRETATION

In the initial phase of the study, the analysis used secondary data on migration available through the RA National Statistical Services to identify villages or towns with the highest outflows of labor migrants to countries of the Eurasian Economic Union (EEU).⁶ These statistics were used to develop the sample size that would ensure the validity and generalizability of findings. The number of survey respondents is 536, which exceeds the valid sample size required for the population of labor migrants ($N = 232,647$).⁷

The data collected from the survey ($n = 536$)⁸ was analyzed to depict the general characteristics of the population surveyed and to establish correlations among dependent and independent variables. Chart 1 depicts the size of the household, without counting in the migrant(s) from the households surveyed. In many cases, the household count included grandparents as is customary in Armenia and, in a few cases, great aunts and uncles. The graph peaks at the most dominant household size of five (5), usually comprising the migrant's wife, two children, and the migrant's parents. The trough level is one (1) representing the smallest household size, which in the sample surveyed is simply represented by the wife of the migrant left behind. The number of cases in this category is low and represented by newlyweds having a migrant husband.

Chart 1: Household Distribution



The percent distribution by age-group and gender of households in the sample surveyed is depicted in Chart 2. These data include the migrants themselves. The bar chart depicts that, except for the ≤ 15 and ≥ 71 age groups, where males have dominance over females by 0.2%, all other age groups are female-dominant, though the migrants themselves are mostly males (94% of total migrants). The female dominance of the sample surveyed (and also of the inferred population, in general) is largely attributed to the absence of males from the home country and also to the demise of Armenian soldiers in the conflict with neighboring Azerbaijan on the Nagorno-Karabakh territory.⁹ The ≤ 15 and ≥ 71 age groups evidently are not affected by this and reflect normal gender distribution trends.

⁵ A larger number of households were approached randomly but were not administered the survey if they did not meet the key criterion of having a migrant family member. This number represents the actual number of survey respondents, i.e., the wives or mothers of labor migrants that took the survey.

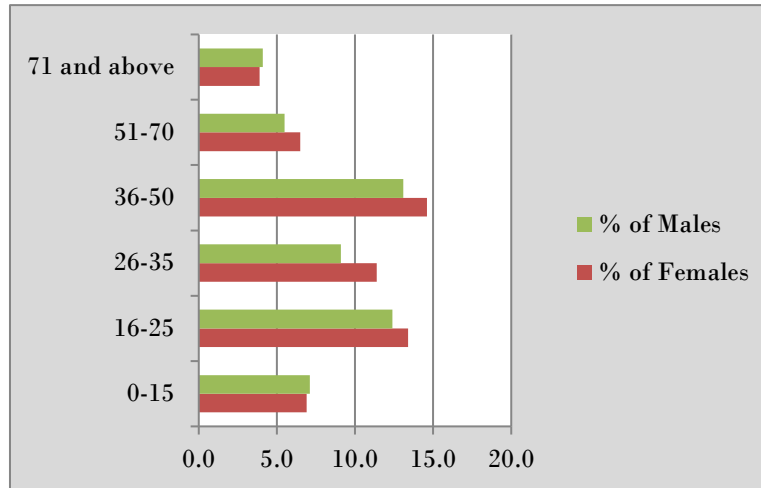
⁶ The countries included in the statistics are the Republics of Belarus and Kazakhstan, the Kyrgyz Republic, and the Russian Federation, the latter representing the destination with the largest proportion of labor migrants from Armenia.

⁷ Armstat, 2017.

⁸ This sample size far exceeded the valid sample size of 384 at a confidence level of 95% and a margin of error of 5%. Considering that the surveys were conducted face-to-face, additional villages were added to increase variation to the extent possible.

⁹ The war between Armenia and Azerbaijan, which broke out before the declaration of the independent Republic of Armenia ended in 1994 but the conflict continues to be unresolved. Skirmishes across the border still cause fatalities. In Armenia, military service is mandatory for males 18-27 years of age.

Chart 2: Distribution of Sample Surveyed by Gender and Age

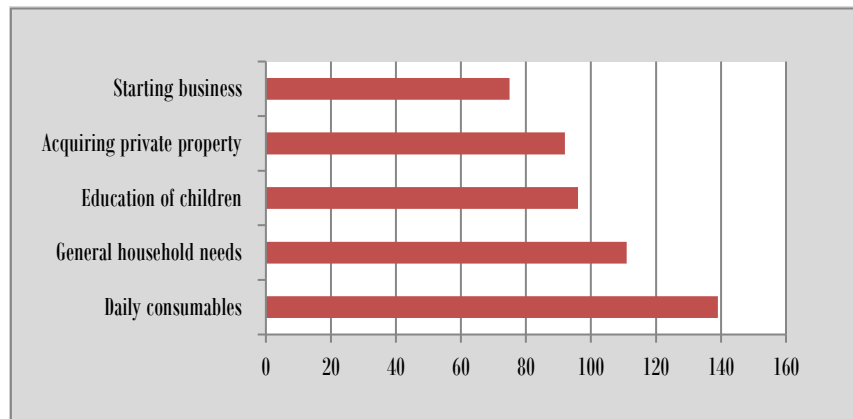


As to the reasons supporting labor migration, the analysis revealed that labor migrants generally opt to work in countries other than their home state to increase earning potential. This is driven by several underlying factors, not mutually exclusive, the most dominant being unemployment or seasonal unemployment (45%); pursuing better-paying job opportunities (42%); inspired or encouraged by friends (38%); or simply responding to job announcements (3%). Considering that drivers or reasons of migration, albeit important, are beyond the boundaries of this research, no further analysis was performed on this component.

Next, the analysis centered on variables related to spending patterns of remittances sent home by

migrants as those are distinctly related to social issues. To answer this question, the survey respondents were asked to indicate only one spending priority (even though they also could be spending some smaller proportion of remittances on other things). As shown in Chart 3, 26% of the households surveyed spend the remittances they receive principally on daily consumables (mostly food items) and 21% spend them on general household needs, including utilities, supplies and purchases of personal items. Whereas the former was dominantly representative of city dwellers, the latter represented the spending pattern of villagers that grew fruits and vegetables and had animal farms (albeit on a small scale for household consumption).

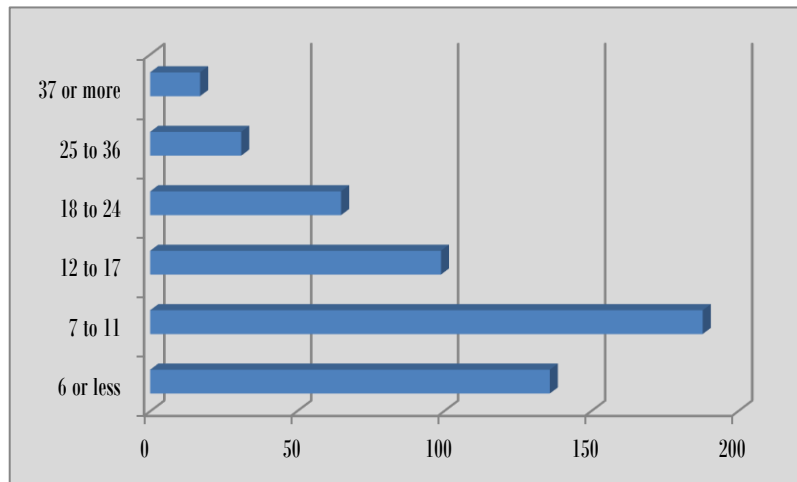
Chart 3: Spending of Remittances



Spending remittances on the education of children, especially on higher education, was ranked as a priority by 18% of the sample surveyed, but prevalent only among city dwellers with children in higher education. The respondents that ranked education as priority for spending remittances were in the 36-50 age-group, i.e., families with near or at university-age children. Equally important for 17% of those surveyed,

also among city dwellers as in the previous case, was investing in owning a home (real property) either for themselves or for a son (not daughter, as specified by respondents) preparing to get married. This is a preferred investment that stems from the desire for future stability and security (generally evident among peoples that have been displaced or driven out of their homes because of war or political unrest).

Chart 4: Months Migrant Away from Home



The much less popular preference for spending remittances is investing in private business, at 14%. This too was found to be dominant among city dwellers who understood the long-term advantages of starting a business. Of the 75 respondents indicating business investment as a priority spending category, 51 were women engaged in micro retail with no physical outlet. Among those whose husbands were earning more or sending home larger remittances, a prevalent practice was to stash away money to be able to accumulate savings for a business startup (without adequate proof of realization). The remaining 4% of priority areas included eleven (11) cases of spending on health issues (usually major surgery, though this could have been a priority at time of survey only); eight (8) cases of saving for upcoming weddings (mostly of a son, though there were three instances of dowry for daughters); and four (4) cases of saving to buy a vehicle (those were farmers who were on seasonal work abroad and aimed at making enough money to buy a truck for agricultural use).

Looking into the social impact of labor migration, the survey first measured the length in months of the migrants' longest absence from home.¹⁰ As depicted in Chart 4, the most prevalent length is seven (7) to eleven (11) months with 35% of those surveyed in that band, 18% in the band of 12-17 months and 12% representing those who have spent up to two years abroad in one tour. Outside of these bands, there are those seasonal migrants who usually travel abroad to work for part of the year and work on their farms for the rest; this group spends six (6) months or less working abroad and constitutes 25% of those surveyed. In the last two bands are those that were working abroad for more than two years (6% for 25-36 months

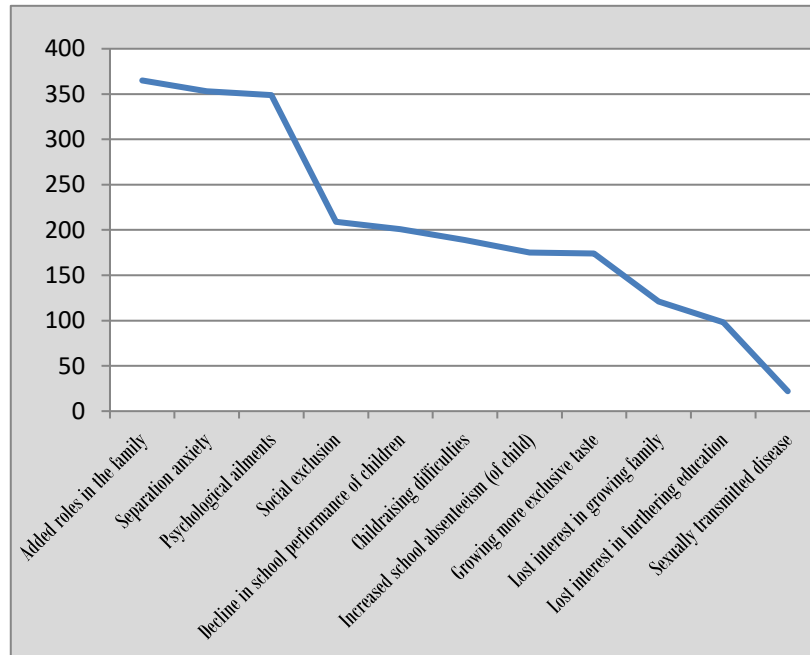
and 3% for longer). Many of the spouses of migrants in the last two bands (and a few in the third band) cast doubt on their husband's return home and struggle to get adjusted to their situation.

The next set of questions related to the types of social problems encountered by the family left behind. Respondents were asked to check up to four (4) answers from the provided list and were given the option of adding-in items excluded from the list. Analysis of the data from respondents helped to identify the dominant social problems related to labor migration, as shown in Chart 5.

Unquestionably, the most dominant social issue caused by labor migration is that those left behind are bound to assume added roles in the family. In this respect, the follow-on interviews with mothers and wives of migrants helped to draw common themes among urban and rural households. Whereas the latter claim that not only do they have to assume additional household chores, but also have to take care of responsibilities in the family farm; urban residents spoke about additional chores related to children's curricular and extra-curricular activities. As one interviewee explained, *"I never had to worry about my son's schoolwork before. That was something my husband loved doing. Now, that too is on me and I am not as good at it."* In contrast, a rural resident raised the shortage of productive labor in the village to sustain agriculture. *"My husband and his brothers are not here, which makes us women having to work on the farm in addition to looking after our children. Often, I pull in my son to help out with those chores."*

¹⁰ The length of time in months the migrant has worked abroad every separate time travelled or tour of duty.

Chart 5: Social Problems Encountered by Family at Home



Another dominant theme was found to be anxiety disorder caused by the absence of the father; 66% of respondents marked separation anxiety as a problem that has had negative behavioral consequences. This type of health condition is described by those interviewed further as being “*fear of being among people so as to avoid people asking me questions or not participating in public events afraid that others are pointing to me or they are judging me,*” elaborated a young woman whose husband had been away for over two years. Another interviewee talked about the negative encounters that her son, a twelve year-old, had in school. “*Just before the holidays, a classmate asks him if his father is coming home for the New Year. He goes ballistic and starts pushing and shoving that boy, throwing around books and notebooks in the classroom. He is a good boy and helps me around the house, but he is incapable of dealing with comments or questions about his father.*”

The majority of respondents who had indicated having separation anxiety, also indicated suffering from other psychological disorders, such as depression, eating disorders, and even obsessive-compulsive behavior (65% combined) and social exclusion (39%). Follow-on interviews showed that respondents with such disorders suffered from feeling helpless and worthless or did not hope they would be together again; and some had developed extreme under-eating disorder (though this can be manifested in the opposite way). As one woman elaborated, “*his long absence makes me wonder what the future holds for us. I am always at home, doing housework or working on the farm. Well, I don’t even visit or meet with my friends anymore. I’ve lost touch with everything.*”

The picture presented by an older woman in a relatively smaller village was more alarming. “*Take a walk through our streets and you will understand why our village is depressed, economically and socially. Our men are gone, we don’t have enough working hands to work on our lands.*” This is consistent with what Adams (1969) describes as a passive community of elders, weakening skilled workforce, and a predominantly remittance-dependent community of unemployed citizens. In larger rural communities, however, passiveness also was observed in the younger generally content with their lives “*just the way it is,*” as indicated by a 23-year-old female living at home.

Among family members included in the sample, 18% showed indifference toward learning and were disinterested in education (much like Anush introduced at the opening of the study), though a few indicated that they may want to learn sewing or needlework. All of those were 16-35-year-old village residents with migrant brothers or spouses who also had not attended university. This shows that, particularly in small rural communities, individual educational decisions are led by the quality of life and attainments of those in their immediate surrounding. This refers to the relative position of individuals in a community as characterized by economic capital and human capital (Weeden & Grusky 2005). Here, economic capital means one’s material resources like income and assets as indicators of social status (Oakes & Rossi 2003).

VIII. CONCLUSION

Among the propositions considered in the study, the analysis has shown that remittances positively

impact the education of the younger generation in the home state, particularly providing for the higher education of children left behind, though this is reflected in 18% of the population surveyed and ranked third among the priorities of spending remittances, after daily consumables and general household needs. Moreover, this spending priority was not found to be true outside the capital, which could partially explain the slowdown of human capital growth in rural communities and the unequal distribution of wealth and economic growth between urban and rural populations. Also, 21% of migrants who were away from home (in a single tour) for over 18 months, were all from rural Armenian villages. This too has contributed to the slower growth in human capital in rural Armenia, which could be improved if intangible resources, such as skills and knowhow that migrants acquire working abroad, were used for narrowing rural-urban inequalities with returning migrants' investment in human capital at home.

Moreover, the male figure, mostly father, is perceived by Armenian society as an important influence on children's upbringing, particularly with respect to their educational attainment and prospects, but the 'breadwinning' obligation was found to be dominant. Though patterns of child behavior varied by social context, the findings agree with much of social science and policy research on the negative impact of fathers' absence on children's socioemotional development (Lamb, 2010; Shwalb et al., 2013). Among the adults surveyed for this study, 38% mentioned a decline in their child's school performance and 33% referred to the rise of school absenteeism. Overall, 35% indicated experiencing child raising difficulties, some verbalizing the envisaged *"father's role in authoritative parenting, which would lead to better emotional, academic, social and behavioral outcomes for our children."*

The negative impact on the health of other than children was observed in the form of separation anxiety disorder in women among younger spouses who feared that their separation would be unending and gradually became unsociable, withdrawn, and irritable. Only 4% of those surveyed checked "sexually transmitted diseases" caused by labor migration but, when probed further, none admitted that their migrant was infected by the disease. Social taboos placed by Armenian society on sexually transmitted diseases is probably the reason why people didn't like talking about it or referring in any way to their husband's promiscuity.

The last proposition considered dealt with the longer-term social problems arising from remittances sent home by migrants. Though many of the negative impacts of migration mentioned above also are true in the longer-term, what is specifically relevant to remittances is the panacea for the poor to gain a "foothold on the ladder" as argued by (Sachs 2005) which, however, turns to a permanent way of life.

Admittedly, migration reduces socio-economic inequalities to some extent, it also decreases migrants' desire to find a job locally and increases migration propensities by others. Families get used to the steady flow of income and are not willing to do with less and want to avoid a downward spiral.

Adopting a controlled and somewhat restrictive migration policy is not necessarily an effective instrument to curtail labor migration. Rather, considering that job opportunities in the regions are relatively lacking, state policy should be focused on creating incentives that would be attractive to potential migrants gradually affecting the multiplier effect of labor migration.

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Neuronas Von Economo: Sustrato De La Intuición Como Autopercepción Integrada

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Resumen- Los estudios comparados de Allman, Hof y Gucht, respecto de las neuronas en huso en humanos y odontocetos en tanto sistema particular diferenciado, revelan funciones de integración del registro perceptivo del cuerpo y emociones derivadas de la historia vital.

El hallazgo que supone la neurogénesis postnatal y posterior desarrollo puberal del sistema von Economo, introduce la comprensión de aquellos factores que favorecen tanto la adaptación del cuerpo al espacio durante la primera infancia, como la crucial aceptación de los cambios adaptativo-conductuales durante la adolescencia, cuando tienden a la retroalimentación positiva de las posibilidades del propio cuerpo, o la confianza en sí mismo, de carácter saludable, autosostenida y orientada hacia la contribución del bien común.

Los estudios de las funciones de integración del sistema fusiforme, además de aumentar nuestra comprensión sobre el sustrato neuronal que reúne la suma de percepciones y huellas fisiológicas de la experiencia adaptativa, representan a su vez, un aporte sólido a las Neurociencias de la Ética y la Fenomenología kantiana, por cuanto ambas reflexionan sobre la necesidad de incorporar percepciones objetivas que ofrezcan solidez a la elaboración de conceptos abstractos.

Palabrasclave: neuronas en huso – percepción integrada – intuiciones y conceptos.

GJHSS-H Classification: FOR Code: 140299, 110904



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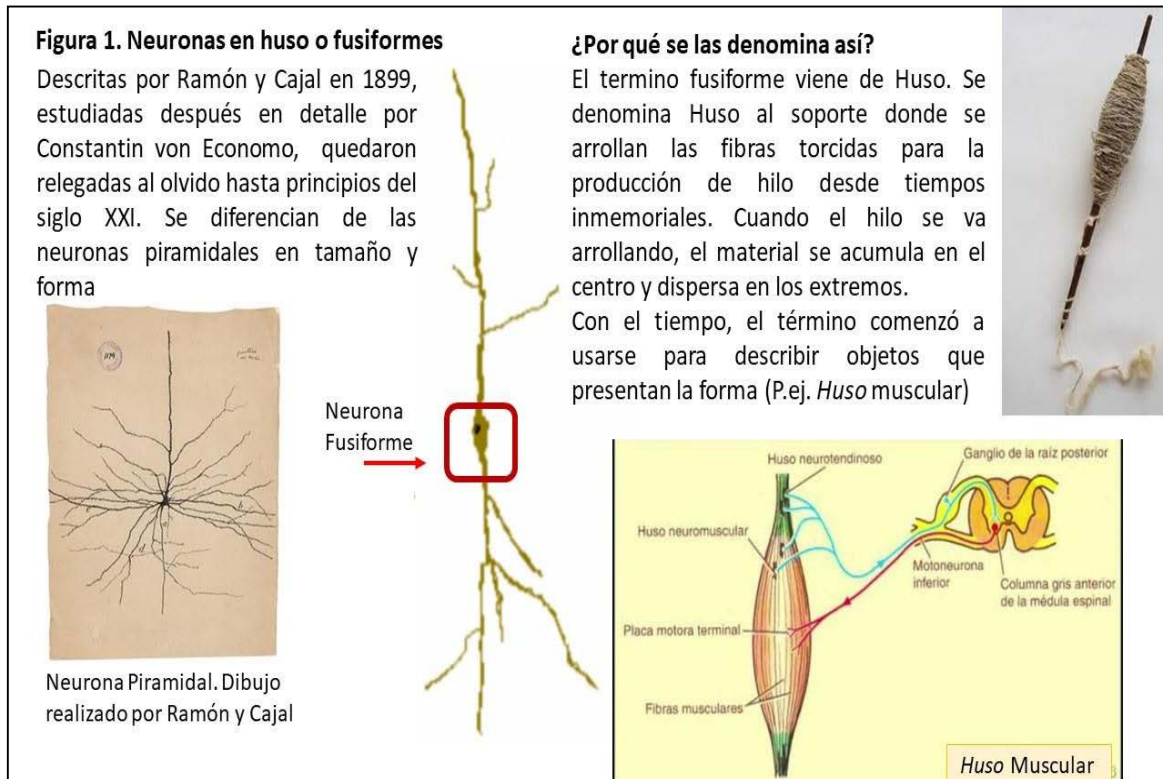
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I. INTRODUCCIÓN

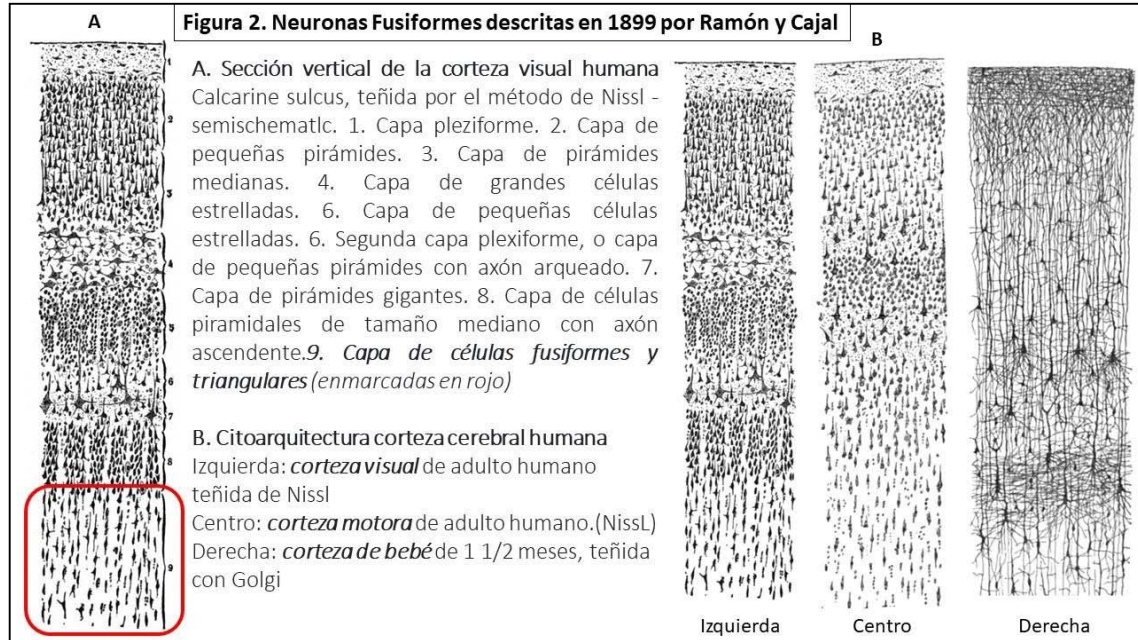
Se conoce actualmente como sistema de Neuronas von Economo (NvE) a las redes de neuronas con forma de huso, claramente distinguibles de las neuronas piramidales en forma, tamaño y ubicación en las capas corticales.

Las primeras descripciones naturalistas de las *neuronas en huso* fueron documentadas por el médico español Santiago Ramón y Cajal (1899). Aquí resulta pertinente distinguir para evitar confusiones, entre las neuronas vinculadas con los *husos musculares*, y las neuronas con el *núcleo en forma de huso* de la neuroglia (Figura 1)



El reconocimiento de las respuestas neuronales vinculadas con la neuroglia, se atribuye a Rudolf Virchow (1921-1902), así como el descubrimiento de las particularidades del tejido nervioso.¹ En 1846, describió la sustancia conectiva no neuronal en cerebro y médula espinal en la que los otros elementos del sistema nervioso (células nerviosas y fibras) estaban embebidos (Virchow, 1846) y denominó a esta sustancia *Nervenkitt* (pegamento nervioso), término más tarde traducido por neuroglia. Virchow también observó que la sustancia intersticial contenía *células especiales con forma de huso*.

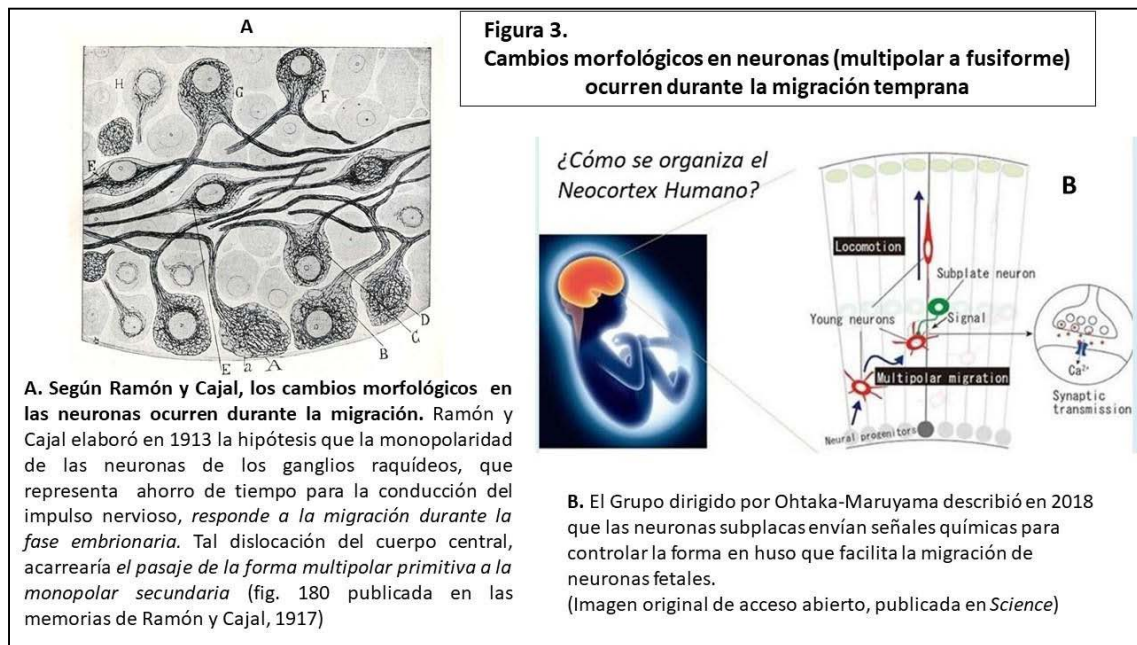
Ramón y Cajal realizó las primeras descripciones naturalistas de la citoarquitectura cortical en 1899, y posteriormente, en 1913. (Figura 2) Además realizó descripciones esenciales sobre la identificación, estructura y función de la neuroglia, y describió magistralmente la neurogénesis de las células fusiformes, la morfología de los astrocitos y su relación con las neuronas y vasos sanguíneos (De Felipe, 2005; Salvetti 2018b)²



¹ Rudolf Virchow (1821-1902) es considerado el padre de la biología molecular y la anatomía patológica. En 1845 introdujo el método novedoso en Etiología que requería de la observación microscópica del tejido enfermo con métodos experimentales. Virchow desarrolló el concepto que las unidades básicas de la vida eran las células del organismo viviente, y que sus condiciones patológicas resultarían en alteraciones funcionales del tipo correspondiente de tejido, (epitelial, conectivo, muscular o nervioso) debidas a factores externos, estableciendo los fundamentos de la Patología celular desde entonces. En medio de las discusiones sobre la generación espontánea de la vida, Virchow además estableció en 1855 junto con Robert Remak (1815-1865) el principio que resultaría central en biología: "Toda célula proviene de otra célula" (omnis cellula ex cellula) que con posterioridad difundiría Pasteur. (Pérgola y Okner, 1986: 339-361)

² Las descripciones iniciales a cargo de Ramón y Cajal publicadas en 1899 condujeron a una profundización de los estudios sobre la neuroglia en 1913, tal como cita en sus memorias "Por nuestra parte, hace años (1913) topamos también en la sustancia blanca del cerebro con un elemento especial, que designamos neuróglia heterotípica, fusiforme, y con escasas expansiones" Sin embargo, Ramón y Cajal dando muestras de su habitual honestidad intelectual, reconoce que la "revelación de la generalidad de este corpúsculo microglial y la descripción de las diversas formas que adopta en el cerebro, se debe a Río Hortega, el cual ha puesto también de manifiesto sus fases evolutivas y su origen leucocítico. Para ello se ha valido de su método especial del carbonato de plata. Acaso algún autor extranjero, quizá Roberston, vislumbró, en preparaciones imperfectas, tan interesantes elementos; mas como ni los describió con precisión ni los dibujó tampoco, es imposible decidir a ciencia cierta qué cosa sea lo que calificó de mesoglia. También debemos a Río Hortega la demostración de que las Stabchenzellen de Nissl, constituyen una variedad de la microglia" (Ramón y Cajal, 1899, 1913 y 1917)

La hipótesis de Ramón y Cajal sobre la neurogénesis de las neuronas en huso durante el desarrollo y maduración del cerebro humano, fue confirmada experimentalmente hace poco. (Figura 3) El Grupo de Tokio dirigido por Ohtaka-Maruyama, describió en *Science* cómo la forma de las neuronas en huso responde a mensajes químicos transmitidos por neuronas subplacas sobre neuronas multipolares.³ De este modo el grupo de Tokio confirmó experimentalmente la hipótesis de Cajal realizada hace más de un siglo. (Ohtaka-Maruyama et al, 2018; Salvetti 2018b)



³ El Grupo del Instituto Metropolitano de Ciencias Médicas de Tokio, dirigido por Chiaki Ohtaka-Maruyama, publicó recientemente en *Science* un trabajo que describe el cambio de forma en las neuronas fetales durante su migración desde lo profundo del cerebro hacia su destino en la neocorteza. El equipo de investigación siguió la migración de un tipo especial de neuronas fetales, que forman sinapsis transitorias con neuronas recién nacidas y envían señales para controlar el viaje. Durante el desarrollo del feto, la neurogénesis profunda deriva de divisiones celulares repetidas de células progenitoras, para producir enormes cantidades de neuronas excitadoras, que al inicio presentan forma multipolar, y migran a la corteza de manera lenta, serpenteante, y sin dirección establecida. El Grupo observó el momento cuando las neuronas multipolares cambiaron repentinamente hacia una forma de huso con dos protuberancias, y comenzaron a migrar rápidamente hacia la superficie del cerebro en procesos de locomoción dirigida. El Dr. Ohtaka-Maruyama (2018) presentó la hipótesis que las neuronas subplacas expresan proteínas para atraer y transformar las sinapsis transitorias de neuronas multipolares recién nacidas en neuronas migratorias en huso. Observó asimismo que estimular las neuronas recién nacidas con el neurotransmisor glutamato, que imita la actividad sináptica, mejora la migración radial.

A partir de la década de 1920, el sistema de neuronas fusiforme pasó a ser conocido como sistema de neuronas von Economo, debido a la difusión alcanzada a principios del siglo XX de los trabajos realizados por Constantin Von Economo (1876-1931)

El barón y médico austríaco Constantin Freiherr von Economo (1876-1931) inició sus investigaciones como asistente de Wagner Jauregg, psiquiatra en Viena. Allí se dedicó a la anatomía y fisiología del cerebro medio, la protuberancia y la vía del nervio trigémino. Von Economo estudió detalladamente el tamaño y número de neuronas fusiformes, y las describió como enormes neuronas alargadas, que presentan el núcleo con forma de huso, y un tamaño que cuadruplica la célula piramidal. Indicó que se trataba de una célula especializada y localizada en el giro insular.

El Dr. von Economo alcanzó gran reconocimiento en su tiempo, luego de describir la encefalitis letárgica como una de las causas principales de la enfermedad de Parkinson post-encefálica también conocida como Enfermedad de Von Economo.

En 1925, publicó junto a George Koskinas *Die Cytoarchitektonik der Hirnrinde des Menschen Erwachsenen*, obra olvidada durante décadas.

Luego de esos avances sobre patologías derivadas de lesiones neuronales, el sistema von Economo fue simplemente archivado en investigación biomédica.

El monumental Atlas citoarquitectónico de la corteza cerebral humana adulta que Economo y Koskinas presentaron en 1925, fue objeto reciente de revisión por Lazaros C. Triarhou, quien reconoce que su elaboración representó un gigantesco esfuerzo intelectual y técnico. Las 44 áreas de Brodman, fueron ampliadas por Economo y Koskinas a 107 áreas corticales. Los criterios citoarquitectónicos del Atlas original confirieron la ventaja de un esquema de parcelación más detallado. Von Economo y Koskinas acompañaron su trabajo con grandes placas fotomicrográficas de sus diapositivas histológicas, junto con tablas que contenían información detallada de la capa morfológica indicada, el tamaño de la neurona y el grosor del manto cortical de cada región descrita. El Atlas von Economo-Koskinas, a partir del éxito de la reedición 2007, fue recientemente digitalizado, dado que ofrece información contrastable con los datos que arrojan las IRM (Triarhou, 2007; Scholtens et al, 2018)

Durante décadas se creyó que el desarrollo fusiforme ocurría únicamente en el cerebro humano, hasta que comenzó a recibir atención al descubrirse en cerebros de algunos primates (no todos) en cetáceos (ballenas, cachalotes y delfines) y en elefantes, tanto asiáticos como africanos. Estas especies son conocidas tradicionalmente por su inteligencia, su sentido de socialización y cooperación para supervivencia. Desde la antigüedad encontramos

relatos de naufragos que recibieron ayuda crucial de mamíferos marinos para llegar a la costa y sobrevivir.

No debiera llamar la atención que la publicación del hallazgo de neuronas de huso en el cerebro de estos mamíferos, consiguiera impulsar el estudio de las funciones diferenciadas de estas neuronas en el cerebro, y, por ende, en la mente y comportamiento humanos.

Este artículo está dedicado a conocer las funciones recientemente descubiertas de estas neuronas. Para ello iniciaremos con los trabajos de Hof y van der Gucht, quienes realizaron estudios de anatomía comparada de neuronas cerebrales procedente de mamíferos marinos. Seguiremos con los trabajos del Dr. Allman, quien propone a las neuronas en huso como *neuronas de la intuición*.

Finalmente, y a modo de corolario, el extraordinario hallazgo de las funciones de las neuronas en huso además de aumentar nuestra comprensión sobre el sustrato neuronal que reúne la suma de percepciones y huellas fisiológicas de la experiencia adaptativa, representan a su vez, un aporte sólido a las Neurociencias de la Ética.

Las Neurociencias de la Ética, procuran comprender y describir el *sustrato neuronal* que impulsa de modo exitoso las conductas adaptativas humanas, particularmente cuando tales conductas individuales derivan de una ética de los afectos positivos. La recuperación de los estudios del sistema neuronal diferenciado von Economo, representa un formidable aporte a las Neurociencias de la Ética y la Fenomenología kantiana. La intuición, según la propuesta del filósofo alemán Immanuel Kant (1724-1804) merece integrarse en toda formulación racional de conceptos. La integración de ambas áreas neuronales en flujo unificado, en particular durante momentos cruciales de la existencia, tales como la primera infancia y durante la adolescencia, representa un factor crucial para obtener adaptación plena al entorno y salud mental auto-sostenida.

Comencemos a ver lo que ofrecen entonces los distintos investigadores sobre el tema. *Novedades en la estructura de la corteza cerebral en la Ballena*

En 2007 por los estadounidenses Patrick Hof y Estel van der Gucht realizaron un amplio estudio de citofisiología cerebral comparada de mamíferos marinos. Los investigadores introducen para discusión académica lo que “representa una de las raras descripciones de la *organización cortical de un cerebro místico*” (Hof y van der Gucht, 2007)

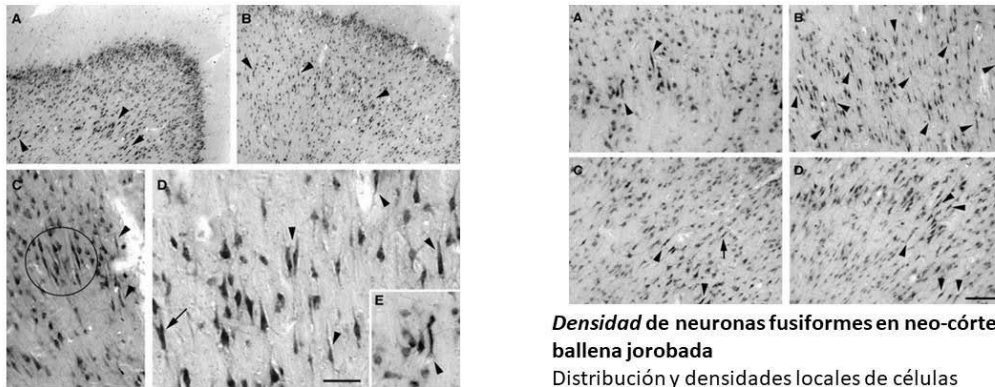
El estudio se concentra en describir la citoarquitectura de la ballena jorobada *Megaptera novaeanglae*, cuyo neocortex que presenta abundantes células fusiformes, o von Economo. Los investigadores fueron claros en expresar que buscaban revelar características organizativas que sirvan como correlatos de las especializaciones funcionales que caracterizan la

conducta de estos cetáceos.⁴ Encontraron que el neocórtex de la ballena jorobada difiere de otros odontocetos en muchos aspectos.⁵

El equipo de Hof y van der Gucht estudió la corteza cerebral de la ballena jorobada (*Megaptera novaeangliae*) en comparación con otras especies representativas. Si bien la biología de la ballena jorobada está bien documentada, prácticamente no había información en la literatura sobre la estructura de su cerebro más allá de descripciones aisladas de características genéricas de la superficie cortical.

El hallazgo más sorprendente en esta especie de ballena, fue la presencia de *células fusiformes grandes*, (Figura 4) similares en morfología y distribución a las descritas en los homínidos, que pueden proporcionar una base neuromorfológica para las diferencias funcionales, así como un *reflejo de su evolución convergente*.⁶

Figura 4 . Hallazgo de células fusiformes en el neo-córtex de la ballena jorobada



Hallazgo Neuronas fusiformes en Neo-cortex de ballena jorobada. (Hof y van der Gucht, 2007)
Células fusiformes (puntas de flecha) en el cingulado anterior (A) y las cortezas insulares (B). Observe su morfología alargada con dendritas apicales y basales claramente visibles (C y D; puntas de flecha),
(Figura 15 en artículo original Hof y van der Gucht)

Densidad de neuronas fusiformes en neo-córtex de ballena jorobada

Distribución y densidades locales de células fusiformes en el neo-córtex de ballena jorobada. Las células fusiformes son más numerosas en la corteza cingulada pregenual (A) y en la corteza frontoinsular (B). También se encuentran en densidades más bajas en la punta de la región frontopolar (C) y a lo largo de los giros orbitales (D).
(Figura 16 original Hof y van der Gucht 2007)

⁴ El orden de los cetáceos, reúne mamíferos completamente adaptados a la vida acuática. El término cetáceo fue acuñado por Aristóteles para referirse a todos los animales acuáticos que cuentan con respiración pulmonar. Los cetáceos se separaron de los mamíferos terrestres entre hace 50 y 60 millones de años y adquirieron, durante su adaptación a un medio totalmente acuático, muchas de sus características actuales, incluida la ecolocalización, capacidades auditivas y comunicativas notables, así como una organización social compleja.

⁵ Los odontocetos representan un suborden dentro de los cetáceos, conocidos también como cetáceos dentados. Entre los odontocetos se encuentran los delfines y las orcas además de la ballena jorobada. Precisamente se caracterizan por la presencia de dientes (odonto: diente) en lugar de barbas, como ocurre en el suborden de los misticetos. Entre los misticetos se encuentran la Ballena Franca, avistada en nuestras costas patagónicas, así como los animales más grandes que existen sobre la Tierra, como la Ballena Azul. Tanto los odontocetos como los misticetos integran el orden de los cetáceos.

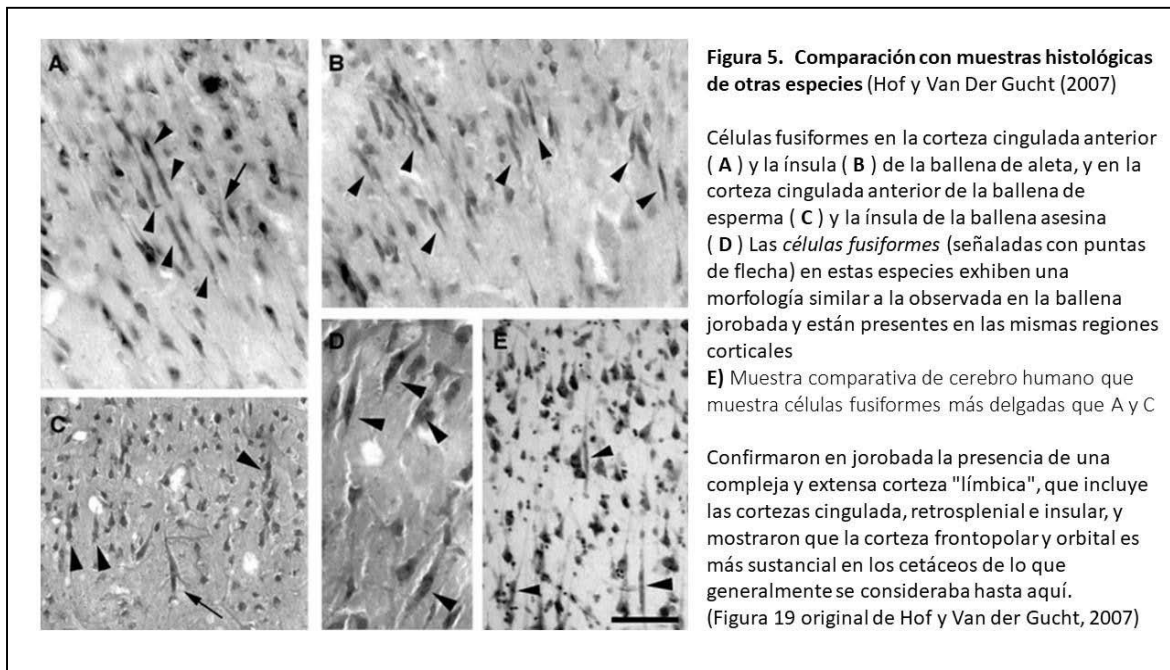
⁶ La evolución convergente, convergencia evolutiva, o simplemente convergencia, se da cuando dos estructuras funcionalmente similares han evolucionado independientemente a partir de estructuras ancestrales distintas y por procesos de desarrollo adaptativo muy diferentes. Sus semejanzas indican restricciones comunes impuestas por la filogenia y la biomecánica de los organismos. A menudo los biólogos distinguen entre evolución convergente y evolución paralela. Se considera que la evolución paralela involucra patrones de desarrollo similares en líneas evolutivas diferentes pero próximas. En cambio, la reversión evolutiva es la pérdida independiente del mismo carácter avanzado en varios linajes de una filogenia. (Fontdevila y Moya, 2003)

Según lo observado por Hof y Gucht, la extensión de las neuronas en huso ofrece una llamativa conexión diferenciada entre emociones y percepciones corporales, donde tales conexiones modulares confieren *niveles óptimos de inteligencia social para relaciones de cooperación tendientes al bienestar y supervivencia del grupo*.⁷

El hallazgo descrito de *células fusiformes* en el neocórtex, es decir, en regiones donde no se habían visto en homínidos, (Figura 5) representa toda una especialización histológica.⁸ Estudios previos demostraron que las células fusiformes representan una clase de *neuronas de proyección* que envían un axón a la sustancia blanca subcortical y *contribuyen a la conectividad de la corteza prefrontal y los centros subcorticales seleccionados*.

La función de las neuronas del huso requiere de estudios más exhaustivos. Existe evidencia procedente de estudios de sus funciones en el cerebro humano respecto que *representan una clase de neuronas de proyección* que envían un axón subcorticalmente y posiblemente de manera callosa. (Allman et al., 2010)

Las neuronas en huso pueden estar involucradas en el control de integración de funciones cerebrales complejas que involucran emociones, control de vocalización, expresión facial o función autónoma, así como regulación de la función visceral, olfativa y gustativa.



⁷ Se sabe que es probable que las proyecciones tálamocorticales de los cetáceos se basen en un cableado muy diferente al de las especies terrestres. Además, el desarrollo de pequeños módulos que forman proyecciones organizadas puede favorecer las redes locales resulten más rentables en términos de demandas de energía en un cerebro muy grande, donde es probable que se opte por redes intrahemisféricas, en lugar de callosales, que ofrecen conexiones más lentas. Tales restricciones apoyarían la economía de cableado y la eficacia de la señalización, crucial para respaldar una función cortical indefinida, pero altamente especializada. Hemos visto en otros informes ofrecidos en esta parte dedicada a la Neurofisiología de la adaptación física al medio, que la conectividad intrahemisférica es crucial en el desarrollo de cerebros eficientes.

⁸ Los datos de Hof y van der Gucht muestran neuronas fusiformes no ambiguas en el cerebro de la ballena jorobada, con la diferencia de que su distribución parece incluir mayor volumen en cingulado y corteza insular. Además, las células fusiformes se encuentran en regiones donde no se habían visto en homínidos como el córtex polar frontal, aunque es probable que no haya homología funcional o topográfica entre la región frontopolar en misticetos y homínidos, así como en muchos otros casos.

Desde la mirada evolutiva, lo observado sugiere que la presencia de las células fusiformes no está necesariamente relacionada con un alto cociente de encefalización, sino con el tamaño absoluto del cerebro.⁹

Recordamos que los *escenarios ontogenéticos y adaptacionistas actúan en sinergia* en lugar de alternativas. Desde un punto de vista evolutivo, es interesante considerar que, en el linaje de los primates, las neuronas fusiformes observadas en humanos y grandes simios, probablemente aparecieron por primera vez en el ancestro común de los homínidos hace unos 15 millones de años.

En el momento de una posible reaparición de células fusiformes en cetáceos, aparecerían en el ancestro de los *grandes simios, presentando un caso interesante y raro de evolución paralela caracterizado por la aparición de un tipo morfológico único de neuronas de proyección*, en un número muy restringido pero significativo de especies altamente sociales, todas caracterizadas por una evolución relativamente reciente, una maduración lenta, una tasa de reproducción baja y pocas crías, un cerebro muy grande y un gran tamaño corporal dentro de sus grupos (Marino, 2002)

Si bien las funciones que desempeñan estas neuronas en las especies de cetáceos en las que se encuentran requieren más estudios, su presencia y distribución en áreas corticales específicas *son consistentes con la evidencia sustancial de comportamiento y complejidad social en cetáceos*. (Rendell y Whitehead, 2001).

En conclusión, las observaciones registran la aparición de un gran número de células fusiformes, haciendo un caso de *evolución convergente con homínidos*. Los cerebros de cetáceos y primates se pueden considerar como alternativas evolutivas en la complejidad neurobiológica y sería convincente

investigar cuántas características cognitivas y conductuales convergentes resultan de una organización neocortical tan distintiva.¹⁰

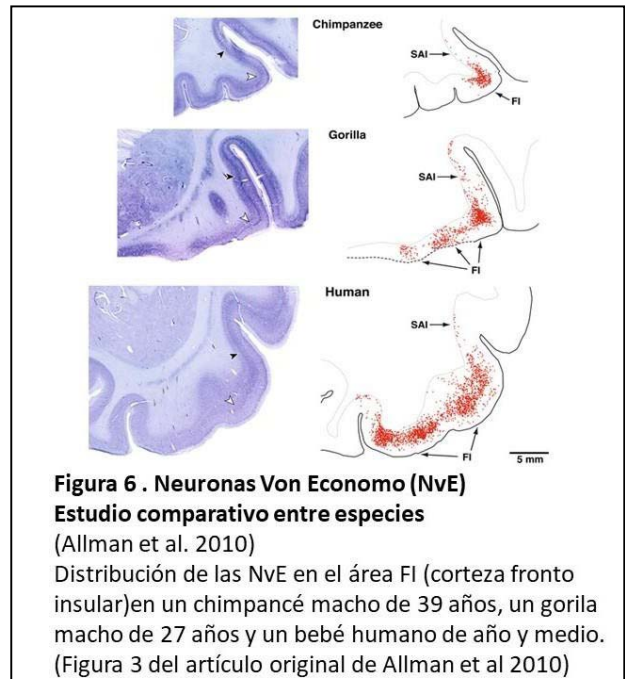


Figura 6. Neuronas Von Economo (NvE)
Estudio comparativo entre especies

(Allman et al. 2010)

Distribución de las NvE en el área FI (corteza fronto insular) en un chimpancé macho de 39 años, un gorila macho de 27 años y un bebé humano de año y medio. (Figura 3 del artículo original de Allman et al 2010)

Los datos publicados por Hof y Gucht (2007) también muestran que la citoarquitectura de la corteza cerebral de los cetáceos es mucho más variable *entre* las especies de lo esperado. En vista del hecho que muchas especies de cetáceos son naturalmente esquivas, están mal documentadas y en grave peligro de extinción, los presentes hallazgos también proporcionan un marco anatómico para futuras investigaciones correlativas y comparativas del cerebro y comportamiento particulares de especies en riesgo.

II. PARTICULARIDADES DEL SISTEMA VON ECONOMO EN LA MENTE HUMANA

John Allman, del California Institute of Technology, viene investigando desde hace años el sistema de las neuronas von Economo (NvE) en tanto sistema de células diferenciadas cuyas funciones únicas pueden ayudarnos a comprender la expresión de sentimientos y emociones, y con ello, la especificidad de la mente humana. (Allman, 2000 y 2001)

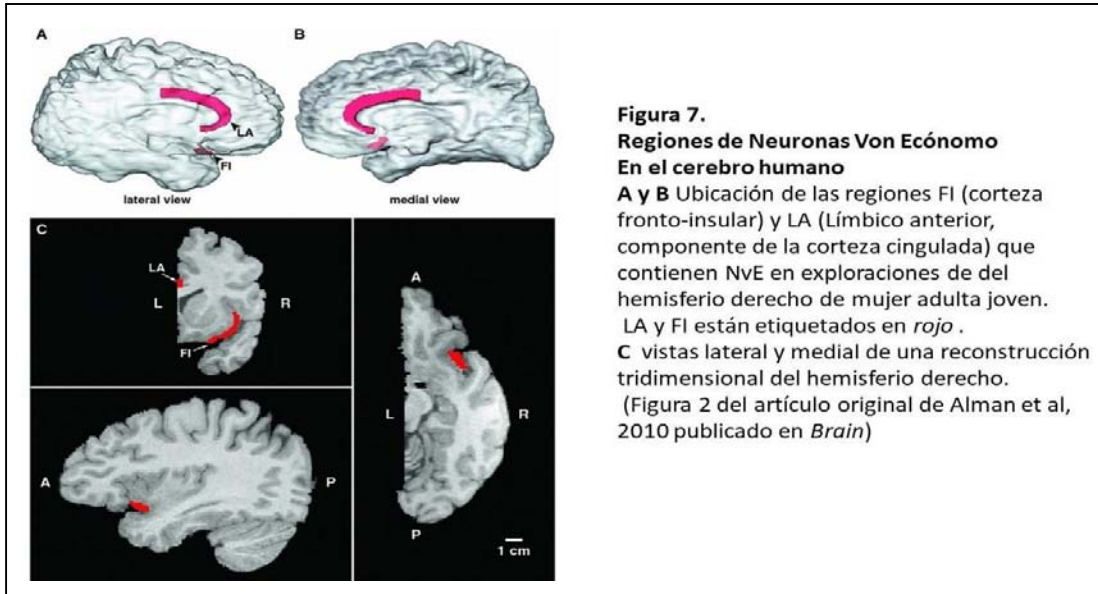
Los estudios citológicos de Allman realizados al comenzar el tercer milenio, presentan hallazgos sorprendentes que revelan las neuronas von Economo bajo una nueva luz. Dichos hallazgos, fueron contextualizados con la información disponible, de

⁹ de hecho, el estudio del cerebro de otros taxones no relacionados directamente con los cetáceos y primates, pero caracterizado por cerebros grandes, como el elefante, será crucial en este contexto. su posible participación de las nve en el control de vocalizaciones en las ballenas, puede ser particularmente interesante en el contexto del rico repertorio de canciones en especies de cetáceos (weinrich et al., 2006) aunque la regulación de tales comportamientos en estas especies probablemente se basa en otros sistemas que en primates. por qué y cómo el tamaño cerebral absoluto sería la fuerza motriz de la evolución de las células fusiformes queda por determinar. es posible que su presencia se correlacione con ciertos aspectos observados en los patrones sociales, como la necesidad de socializar, que se sabe que aumenta el tamaño del cerebro en ungulados, parientes cercanos de los cetáceos. la gregariedad puede verse como una medida de la socialidad y esto, a su vez, sería coherente con el papel propuesto de las células fusiformes en la cognición social (allman et al., 2005). por último, es probable que muchos aspectos de la conectividad cortical y subcortical difieran en los cetáceos de las especies terrestres, como lo demuestran los patrones únicos y la regulación hemisférica del sueño y la vigilia. si las células fusiformes contribuyen a tales funciones y patrones de comportamiento, al tiempo que representan hipótesis interesantes, permanecen dentro del ámbito especulativo.

¹⁰ A pesar de la relativa escasez de información sobre muchas especies de cetáceos, es importante señalar en este contexto que los cachalotes, las orcas y las ballenas jorobadas exhiben complejos patrones sociales que incluyen habilidades de comunicación, formación de coaliciones, cooperación, transmisión cultural, e incluso el uso de herramientas

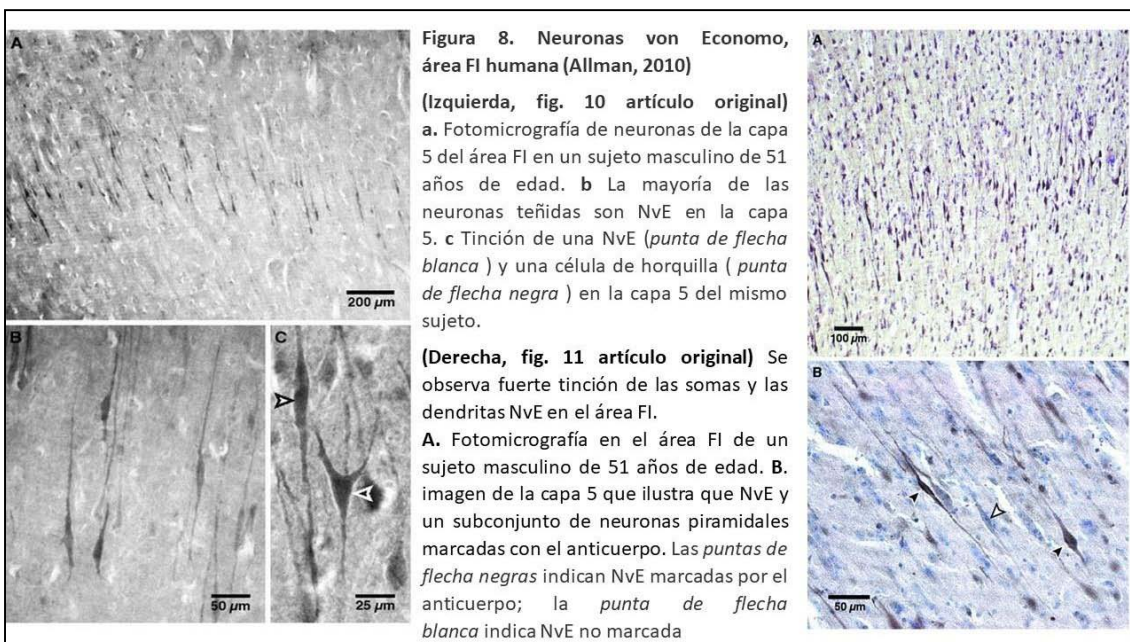
modo que permitan realizar inferencias sobre las funciones de este sistema neuronal específico, con enormes consecuencias para la psiquis humana. El descubrimiento del mismo tipo de neuronas en el sistema de animales de enorme inteligencia como ballenas, delfines y elefantes, ofrecen pistas sobre las funciones de cooperación social que ha sido observada en este grupo de mamíferos. (Figuras 6 y 7)

Allman describe su neurogénesis particular, donde su crecimiento y consolidación depende del vínculo con la madre y de condiciones socioambientales específicas. Además, por otra parte, su disfunción ha sido asociada recientemente con las severas dificultades para interacción social que presentan personas diagnosticadas con autismo o esquizofrenia (Seeley et al, 2006; Allman et al, 2005)



Las NvE son neuronas de proyección, y se distinguen en tamaño y forma de sus vecinas. Poseen una sola dendrita basal grande, a diferencia de las neuronas piramidales, que tienen una serie de dendritas basales más pequeñas. La gran dendrita basal puede haber resultado de una transformación durante la evolución de los programas genéticos para

el desarrollo de neuronas piramidales para concentrar el crecimiento del componente primario de la dendrita basal y suprimir la ramificación secundaria y terciaria. Las NvE tienen una arborización dendrítica estrecha que abarca las capas de la corteza y pueden muestrear y transmitir rápidamente la salida de una matriz de neuronas en forma encolumnada. (Figura 8)



Las neuronas fusiformes son observables en cerebros humanos y en pequeñas cantidades en la semana 36 después de la concepción, siguen siendo escasas en el momento del nacimiento, aunque aumentan en número durante los primeros 8 meses después del nacimiento. La mayoría de las NvE emergen postnatalmente, lo que se puede ver en sus números, concentraciones y en la formación del *predominio hemisférico* de las NvE en el lado derecho en los primeros meses después del nacimiento. Esta aparición podría producirse por la transformación de otro tipo de células en las NvE o por neurogénesis postnatal.

El Grupo de Allman encontró diferencias notorias entre la distribución NvE de humanos y simios. La densidad de las NvE en relación con otras neuronas en la corteza insular y el sistema límbico es significativamente mayor en los simios que en los humanos. Una posible explicación es que puede haber otras poblaciones neuronales especializadas que se expanden diferencialmente en humanos en relación con los simios. La presencia y distribución de NvE resultan variables en los orangutanes, al igual que los informes de su comportamiento social.

Otro hallazgo importante que arrojó la investigación, reveló un *mayor número de NvE en el hemisferio derecho que en el izquierdo*, excepto en sujetos muy jóvenes. La mayoría de las NvE emergen postnatalmente, lo que se puede ver en la variación en número, concentración y en la formación del *predominio hemisférico* de las NvE en el lado derecho durante los primeros meses después del nacimiento. Esta aparición podría producirse por la transformación de otro tipo de células en las NvE o por neurogénesis postnatal. La forma del huso largo y delgado de las NvE con dendritas apicales y basales, a veces ondulantes, se asemeja mucho a la de las neuronas migratorias con procesos de avance y arrastre ondulados, y esto es particularmente evidente en los cerebros infantiles.

Por último y no menos importante, los investigadores recuerdan cómo los neuropéptidos de bombesina, NMB y GRP tienen una participación crucial en la liberación de enzimas digestivas, donde los sentimientos viscerales y el control de los intestinos interactúan con los circuitos involucrados en la toma de conciencia, la motivación y la toma de decisiones conscientes. En este contexto, la expresión de NMB y GRP representa un aspecto conservador evolutivo de las NvE que refleja funciones muy básicas del control visceral, y permite a los investigadores vincular las funciones integradoras de las NvE con el *marcador somático* propuesto por el Dr. A. Damasio (Damasio, 1999; Salvetti 2019).

Todo hace inferir que, de modo similar a como observamos en el sistema de neuronas espejo, el desarrollo óptimo de las funciones integradoras de las NvE dependen en gran medida del entorno y estímulo

socio-ambiental, particularmente, del tipo de vínculo desarrollado con la madre y el entorno espacial. (Allman et al, 2010; Gilbert et al, 2006)

Allman considera que las neuronas de von Economo *“funcionan como controladores del tráfico aéreo”* pero de las percepciones y emociones asociadas con la experiencia. Y eso lo consiguen *canalizando señales de zonas alejadas entre sí con el encéfalo*. De hecho, la *corteza cingular anterior*, una de las dos zonas donde están concentradas estas neuronas, se activa con las emociones intensas y también durante tareas complejas que requieren juzgar y discriminar, como la detección de patrones irregulares de algún tipo. Esta zona de la corteza parece que es fundamental en el *autocontrol* cuando experimentamos sensaciones intensas como amor, o enojo. Un ejemplo llamativo del papel de la corteza cingular anterior en las *emociones y la discriminación de las mismas*, advierte que estas neuronas se activan intensamente y de modo diferenciado cuando una madre oye llorar a su propio hijo y no a cualquier otra criatura (Allman et al, 2002 y 2010).

La otra zona donde están presentes las NvE, la *corteza ínsula frontal*, (FI) forma parte de un circuito complejo relacionado con el tacto, la percepción del propio cuerpo y emociones más complejas. La actividad de la ínsula anterior inferior, está relacionada con los cambios fisiológicos en el cuerpo, la toma de decisiones, el reconocimiento de errores y la conciencia. (Bush y Allman, 2004; Allman et al, 2001)

El desarrollo de las funciones de las NvE se encuentra involucrado con el funcionamiento ejecutivo de un cuerpo que presenta grandes transformaciones y movilizaciones del sistema emocional y motor hasta alcanzar el autocontrol durante la adolescencia. Houdé (2010) sostiene que la perturbación emocional es consistente con el hecho que los adolescentes a menudo están incrustados psicológicamente en un período de gran reactividad emocional y sensibilidad con sentimientos negativos, que pueden derivarse de los cambios fisiológicos del crecimiento y desarrollo hormonal y corporal. Inmerso en tal torbellino de tales cambios, alcanzar la madurez y el control cognitivo que corresponde con la adultez implica *reconocer y aceptar la necesidad de equivocarse como etapa necesaria*. En esta etapa crucial, el reconocimiento de las *funciones de retroalimentación* de las NvE a medida que el adolescente admite errores y equivocaciones como parte del proceso, contribuye a un desarrollo emocional adaptativo, introduce confianza en sí mismo y permite proyectarse al futuro, impulsado por procesos de retroalimentación positiva favorecidos por el sistema NvE. (Allman 2010)

En el caso de los humanos adultos, estudios recientes vinculan las neuronas von Economo con el sentido del yo, la empatía y la capacidad para organizar y supervisar otras partes del cerebro. Son neuronas

especialmente adaptadas para integrar nuestras emociones y ayudan a concentrarnos. Aunque no producen pensamientos por sí mismas, pueden vincular con éxito diferentes grupos neuronales y reconducir el flujo. (Allman et al, 2010) De todas las especies en que están presentes estas grandes neuronas, los cerebros humanos presentan más cantidad y mayor tamaño relativo. El gran tamaño de las NvE en relación con las piramidales y otros tipos de células cerebrales, les permite tener largos árboles dendríticos y axónicos, que *introducen una rápida comunicación entre zonas alejadas del cerebro*. La necesidad adaptativa de comunicación rápida en cerebros con alto grado de encefalización, representa una presión selectiva hacia la evolución convergente de largas y extensas neuronas en huso en mamíferos de gran tamaño. (Allman et al, 2010)

Las neuronas von Economo en la corteza frontoinsular (FI) impulsan la *retroalimentación* de las emociones, tanto la retroalimentación negativa (para evitar conductas nocivas para sí y el grupo) como positiva (que impulsan a imaginar y trabajar por un futuro mejor) ambas vinculadas con *respuestas inmediatas* ante los imprevistos.

Muchos concluyen que, la evolución de las neuronas von Economo favorecen una adaptación relacionada con el tamaño del cerebro grande. El comportamiento social complejo a menudo requiere respuestas inmediatas, y esto hace que la *capacidad de responder rápidamente a las condiciones cambiantes* (que solemos describir como chispazos de intuición) sea crucial. (Allman et al, 2005)

III. LAS NVE EN LA SUPERVIVENCIA Y MUERTE DE GRANDES MAMÍFEROS

Hay otro aspecto en el que el sistema de neuronas von Economo pueden estar involucradas, y tiene que ver con relatos de viajeros que describen la reacción ante la muerte de los tres grupos de mamíferos que presentan neuronas en huso: elefantes, cetáceos y homínidos grandes

Allman recuerda que la presencia de NvE en el cerebro, ha sido vinculada por especialistas con *funciones sociales complejas*, relacionadas con capacidades únicas de estas especies para la percepción inmediata del entorno, que impulsan hacia formas de cooperación para la supervivencia del grupo. Las NvE sin duda también son las responsables de formas de comunicación avanzada, que impulsan el reconocimiento y búsqueda de otros miembros, mediante el desarrollo de bellos cantos de ballenas, con su enorme variabilidad (Allman et al., 2010)

El reconocimiento de las funciones de neuronas fusiformes en elefantes, quizás aumente la comprensión respecto de las reacciones sensibles descritas ante la muerte por parte de criaturas cuya conducta está

orientada hacia el cuidado, la cooperación y supervivencia del grupo. Circulan en la tradición oral relatos sobre elefantes que escoltan a individuos enfermos, y algunas leyendas populares sostienen que son acompañados hasta sitios referidos como “cementerio de elefantes”. Sin embargo, no se ha encontrado evidencia fidedigna de tales lugares. Las creencias vinculadas con cementerios de elefantes parecen tener origen en lo que se ha observado durante períodos de sequía, cuando los animales migran y se van concentrando en zonas donde quedan las últimas reservas de agua o de comida. En esas zonas, los elefantes se van debilitando y muriendo con lo que finalmente se observa una llamativa concentración de osamentas de elefantes.

Sin embargo, algo que sí ha sido observado en elefantes y gorilas, según relatos de viajeros y exploradores, es que muestran comportamientos de desconcierto en el momento de la muerte de un miembro del grupo, de un modo que presenta similitudes con las reacciones humanas cuando perdemos repentinamente a un ser querido.

En los elefantes se han observado comportamientos característicos alrededor de la muerte. Se les ha visto moviendo con un enorme cuidado los huesos de otros elefantes con sus trompas y patas. También hay referencias de elefantes que visitan el lugar donde murieron otros elefantes.¹¹ Por otro lado, se ha visto a elefantes que acompañan o intentan ayudar a otro elefante que está enfermo o herido, todas conductas impulsadas por *las funciones solidarias* de las neuronas en huso.

Martin Meredith, un escritor especializado en África tiene un libro titulado “Africa’s elephant: a biography” donde cuenta una experiencia de Anthony Hall-Martin. Trata del grupo de un gran elefante, la matriarca del grupo, que acababa de morir. El grupo, incluyendo una joven cría, la tocaban con sus trompas intentando levantarla o animarle a hacerlo por su cuenta. Todo el rebaño de elefantes producía ruidos como si murmuraran. La cría parecía estar sollozando y hacía sonidos que parecían un grito, de repente, todo el grupo se quedó en un silencio impactante. Empezaron a echar hojas y tierra sobre el cuerpo y rompieron ramas de varios árboles con los que la cubrieron. Estuvieron los siguientes dos días de pie junto al cuerpo. A veces marchaban a por agua o comida, pero volvían siempre junto al cuerpo de la matriarca fallecida. (Meredith, 2001)

¹¹ Cuestionamos que algunos denominen “rituales funerarios” al comportamiento de los elefantes. Hay que ser cuidadosos al respecto. Una cosa es la conducta que expresa dolor ante la pérdida de un miembro del grupo, y otra es la conducta simbólica ritualizada que permite superar tal pérdida.

Todos estos comportamientos aparentemente “humanos” pueden ser comprendidos desde las funciones de cohesión y cooperación para la supervivencia del grupo que resultan impulsadas por el carácter particular del sistema de neuronas fusiformes.

El sistema de NvE en tanto sistema neuronal que emergió por evolución convergente en las magníficas especies mencionadas, y su amplio registro de conductas solidarias y cooperativas, merecen diferenciarse del carácter único y particular de la *intuición humana*, también derivada del sistema NvE, pero dependiente de la interacción con las funciones integradoras de la corteza prefrontal (CPF), como veremos al incorporar el tema en el ámbito de las Neurociencias de la Ética.

IV. SISTEMA VON ECONOMO Y NEUROCIENCIAS DE LA ÉTICA

Las Neurociencias, en tanto ámbito interdisciplinar de reciente desarrollo, está abocada a investigar el cerebro y sus funciones más íntimas. Durante el ejercicio de las prácticas, debido a que intervienen sobre lo que se considera la esencia humana (sus pensamientos, emociones, decisiones y valores) surgió la necesidad de algún tipo de reflexión y regulación ética sobre tales prácticas, propiciando la reciente formalización de la *Neuroética* y sus dos derivaciones:

- a) La *Ética de las Neurociencias*, discute los límites éticos de las técnicas invasivas aplicadas al cerebro humano, y
- b) Las *Neurociencias de la Ética*, ámbito de las investigaciones iniciadas por el neurofisiólogo Antonio Damasio, como transdisciplina que procura comprender y describir el *sustrato neuronal* que impulsa de modo exitoso las conductas adaptativas humanas, particularmente cuando tales conductas individuales derivan de una ética de los afectos positivos. Las Neurociencias de la Ética abordan al ser humano en su totalidad física, mental y social.

Las *Neurociencias de la Ética*, por lo tanto, reflexionan sobre la capacidad emocional como poderoso aliado y móvil profundo de toda acción superadora en muchos conflictos humanos. En lugar de reprimir las pasiones, busca maneras de retroalimentar los afectos positivos en la resolución de conflictos. Los aportes de Antonio Damasio que definen experimentalmente la “sensación del sí mismo” a partir del protagonismo de la corteza prefrontal en la dinámica vinculante de esquemas interactivos, darán cuenta de cómo las marcas fisiológicas que la experiencia deja en el cuerpo conforman una huella lo suficientemente profunda como para determinar el tono emocional de las decisiones cotidianas exitosas (Salvetti, 2019)

La recuperación de los estudios del sistema neuronal diferenciado von Economo, representa un

formidable aporte a las reflexiones en Neurociencias de la Ética en general y la fenomenología kantiana en particular.

V. LA PERCEPCIÓN INTEGRADA MEDIANTE “NEURONAS DE LA INTUICIÓN”

Los hallazgos realizados sobre la sensibilidad particular de las ballenas jorobadas publicados por Hof y van der Gucht, y los avances del Dr. Allman cuando propone al sistema de neuronas en huso como el *sustrato neuronal de la intuición*, nos permiten introducir una breve reflexión sobre cómo los datos que proporcionan las neurociencias pueden contribuir a resolver largas disputas filosóficas sobre el carácter de la intuición en el pensamiento humano.

En este caso, nos referimos a la discusión que tuvo lugar en el siglo XVIII respecto de la validez del conocimiento no-conceptual *adquirido mediante los sentidos*, que el filósofo Kant¹² denominó *intuición sensible*, cuando tal conocimiento difiere sustancialmente de los *conceptos* en tanto conocimientos adquiridos *mediante los procesos lógico-analíticos de la razón*. (Stepanenko, 2016)

Para Kant, el conocimiento se adquiere en tres niveles diferentes y sucesivos:¹³

El primero es la percepción *sensible*, que ordena en *tiempo y espacio*, las impresiones objetivas que recibe cada sujeto.¹⁴

En segundo lugar, según Kant, se encuentra el *entendimiento*, cuya función es organizar estas impresiones a partir de ciertas categorías (que tampoco preexisten en el mundo, sino que constituyen formas a partir de las cuales interpretamos el mundo) que nos permiten constituir juicios.

Por último, en el nivel de *razón*, el *sujeto* toma estos juicios, los aísla de toda emoción con el propósito de buscar principios abstractos que deriven en conceptos.¹⁵

¹² Immanuel Kant (1724-1804) filósofo alemán y último pensador de la modernidad. Es considerado uno de los pensadores más influyentes de la Europa moderna y de la filosofía universal.

¹³ El epistemólogo argentino Gregorio Klimovsky (1997) desarrolló una estructura lógica de términos científicos que también distingue entre diferentes niveles de abstracción de la realidad, que toma como punto de partida los datos observables (Salvetti, 2018)

¹⁴ Resulta curiosa la acertada inferencia kantiana, ya que, según hemos tenido oportunidad de advertir en otras investigaciones neurocientíficas realizadas, tanto las percepciones internas como las externas que experimentan muchos organismos vivos, requieren de su integración y consolidación en el Hipocampo, estructura cerebral diferenciada que organiza y consolida los elementos que orientan en tiempo y espacio. (Chang et al, 2017; Bicansky y Burgess, 2018; Pang et al, 2019)

¹⁵ Esta tendencia a buscar principios generales del conocimiento está marcada por las impresiones sensibles, que reciben el impulso de la razón tendientes a la búsqueda de conceptos más allá de la experiencia y con independencia de ésta. El idealismo trascendental kantiano puso el foco en el sujeto que conoce, algo que representó toda una revolución en la filosofía de su tiempo. (Carpio, 2004)

La filosofía desde el tiempo de los clásicos venía insistiendo en la necesidad de aislar los procesos racionales con el propósito de controlar y reprimir las emociones. Sin embargo, Kant en una de sus reflexiones más discutidas, *sostuvo la necesidad de reconocer y reconducir las intuiciones en lugar de reprimirlas o ignorarlas*.

En *Crítica de la Razón Pura* recordamos que Kant distinguió a las intuiciones como ámbito de *impresiones objetivas*. En el mismo texto propuso también la siguiente idea sobre la *necesidad de integrar ambos ámbitos en los procesos de pensamiento*. Básicamente Kant expresó que:

Los conceptos sin referencia objetiva son vacíos, las intuiciones sin conceptualizar, son ciegas Veamos ahora cómo es posible articular la intuición sensible y la abstracción racional en los procesos de pensamiento

VI. LA NECESIDAD KANTIANA DE INTEGRAR INTUICIÓN Y RAZÓN

Es conocida entre los filósofos la censura de Kant a Leibniz por haber concebido la diferencia entre intuiciones y conceptos como únicamente de grado. Conforme a la posición de Leibniz, el conocimiento intuitivo resulta oscuro y confuso, a diferencia de los procesos racionales que derivan en conceptos claros y distinguibles.

Si esta breve digresión filosófica ha de servir como puente para comprender la relevancia del sistema de neuronas von Economo en procesos cognitivos exitosos, conviene regresar un momento a los escritos de Kant para buscar si ha logrado mostrar, de manera convincente y satisfactoria, alguna diferencia esencial entre la intuición y la conceptualización racional, como cosas distintas.

En *Crítica de la Razón Pura*, Kant vincula expresamente la singularidad y la inmediatez con la intuición. La intuición es descripta por Kant como un modo de conocimiento que se adquiere de modo *inmediato*, derivado de la *percepción objetiva*. Por el momento, vale recordar entonces que el mismo Kant propone que la intuición refiere a todo *conocimiento objetivo* adquirido de modo inmediato y a partir de lo que percibimos.

Recuperar estos parámetros kantianos referidos a la *intuición como percepción objetiva de carácter inmediato* resulta relevante cuando estos aspectos han quedado empantanados desde entonces en los debates y rodeos filosóficos centrados en el lenguaje que dejaron fuera el modo en que todo organismo con cerebro percibe la experiencia de estar en el mundo.

La diferencia entre intuiciones y conceptos fue trazada claramente por Kant: *la intuición tiene un carácter singular e inmediato*, y en cambio, el *concepto*

presentaría un carácter universal y secundario, es decir, mediado por la *razón* (López Fernández, 2000)

Si hemos de recuperar el ámbito de la intuición como fuente de conocimiento objetivo de carácter inmediato, cuyos elementos merecen procesamiento secundario anclado en la realidad que nos rodea, es el momento de *comenzar a distinguir al sistema NvE como el sistema neuronal que impulsa y retroalimenta procesos secundarios propios de la corteza prefrontal*, definiendo de este modo el sentido del pensamiento humano.

Las Neurociencias de la Ética, sostienen que en la medida que el pensamiento consigue integrar intuición y razón, los procesos cognitivos tienden a fortalecer y retroalimentar la solidaridad y la cooperación que debieran caracterizar el espíritu humano.

VII. NEV Y CPF: SUSTRATOS NEURALES DIFERENCIADOS DE LA INTUICIÓN Y LA RAZÓN

Desde la fisiología de los procesos cerebrales, hay suficiente consenso que los procesos superiores de la razón humana resultan empíricamente observables en los estudios con imágenes, donde la actividad de la corteza prefrontal “se enciende” mientras busca elementos en las diferentes redes neuronales. Que la corteza prefrontal actúa como una suerte de “director de orquesta” está fuera de toda discusión. (Shestyuk et al, 2017; Beaty et al, 2018 y Brosch et al 2018)

Sin embargo, es el momento de recordar aquí que algunos físicos y matemáticos, entrenados en el ejercicio de procesos secundarios analíticos de carácter racional, han referido la emergencia espontánea de imágenes, ideas o hasta resoluciones de problemas sin haber pasado por un proceso de razonamiento consciente que les permitiera arribar a tales resoluciones. Han reconocido la sorpresa que les produjo tal emergencia espontánea que han atribuido sin dudar a la intuición, invitando a otros a recuperar su validez como fuente de sabiduría.¹⁶

En vista de lo que hemos considerado hasta aquí, ¿Puede el sistema de neuronas von Economo ayudarnos a comprender de dónde surgen tales resoluciones aparentemente “espontáneas”? ¿Habría alguna manera de desarrollar tales resoluciones creativas?

¹⁶ Compartimos algunas reflexiones de notables sobre el enigma de la intuición: “Probamos mediante la lógica, pero descubrimos por medio de la intuición” (Henry Poincaré, matemático, físico teórico y filósofo de la ciencia, 1854-1912) “La mente intuitiva es un regalo sagrado y la mente racional es un fiel sirviente. Hemos creado una sociedad que rinde honores al sirviente y ha olvidado el regalo” (Albert Einstein, físico teórico, 1879-1955) “Dudo que la computadora consiga algún día igualar la intuición y la capacidad creativa del sobresaliente intelecto humano” (Isaac Asimov, escritor, historiador, profesor de bioquímica y divulgador científico, 1920-1992)

Los estudios demostraron que *las células fusiformes representan una clase de neuronas de proyección que envían un axón a la sustancia blanca subcortical y contribuyen a la conectividad con la corteza prefrontal y centros subcorticales seleccionados.* (Hof y van der Gucht, 2007)

Por otra parte, y desde hace cuarenta años, el neurofisiólogo portugués Antonio Damasio (1999) viene desarrollando su hipótesis del “marcador somático” que presenta carácter negativo o positivo. El marcador somático remite a las *marcas fisiológicas que toda experiencia deja en el cuerpo y condicionan la conducta cotidiana* en el momento de advertir las consecuencias de ciertas decisiones. Damasio clasifica tales marcas como negativas (marcador somático negativo) cuando nos damos tiempo para advertir que cierto proceder remite a recuerdos dolorosos que se evitan repetir. Algo similar ocurre con los recuerdos de experiencias positivas (marcador somático positivo) que remiten a recuerdos placenteros para sí y el grupo, que se proyectan a futuro como escenarios posibles. El concepto de marcador somático ofrece un parámetro para la observación tanto de conductas restrictivas como de aquellas conducentes al cambio y transformación social. (Damasio 1999; Salvetti, 2019) El “marcador somático” le permite a Damasio proponer la validez objetiva de sensaciones que surgen “de las tripas” durante la toma de decisiones exitosas para la supervivencia del grupo.

Al respecto, Allman recuerda que la presencia del receptor 2b de serotonina, raro en la corteza prefrontal, pero muy común en las vísceras, sugiere que sistema límbico está monitoreando la actividad en el intestino (Allman et al., 2005) La expresión de los receptores de serotonina en las NvE lo presenta como componente de un modelo neural integrador. Una red neuronal del tipo NvE, permite al organismo *reaccionar más rápidamente* a las condiciones cambiantes que si dependiera únicamente de las decisiones que requieren de procesos secundarios lógicos de razonamiento cerebral. Las NvE y los circuitos relacionados están involucrados en la intuición rápida, que implica una conciencia inmediata sin esfuerzo en lugar de la participación de los procesos deliberativos (Allman 2005)

Toda la evidencia reunida conduce a pensar que *la intuición se desarrolla en interacción con los conceptos racionalmente adquiridos.* “Las intuiciones sin conceptos son ciegas” decía Kant. De allí que muchos sabios han referido que las resoluciones novedosas emergieron de modo sorpresivo luego de haber estado pensando con dedicación y de modo concienzudo en la resolución de un determinado problema, sin éxito alguno. La respuesta apareció en el sueño mientras dormían, o en situaciones cotidianas

una vez que relajaron la tensión psíquica, y abrieron la compuerta a los procesos integradores de las NvE.

Otro ámbito que va sumando evidencia sobre la relevancia del sistema de NvE en reflexiones neuroéticas, remite a sus funciones en la búsqueda del bien común, que permite introducir soluciones prácticas, efectivas y “con los pies en la tierra.” El pragmatismo asociado con las funciones de la NvE presenta un claro contraste con las racionalizaciones propias de un discurso ciego a la realidad cotidiana que nos rodea, tal como también refería Kant. “Los conceptos *sin referencia objetiva* son vacíos”, indicaba el sabio. Y no conducen a nada.

Woodward y Allman (2007) proponen que las intuiciones nos guían a través de interacciones sociales complejas, altamente inciertas y que cambian rápidamente.

Tales intuiciones humanas han sido formadas y desarrolladas tanto por el aprendizaje como mediante la interacción social con el entorno, y, según la evidencia reunida aquí, cuentan con un sustrato neural específico. Los sustratos neurales incluyen las cortezas fronto-insular, cingulada y órbito-frontal, asociadas con la estructura subcortical del tabique, los ganglios de la albahaca y la amígdala.

“Comprender el papel de estas estructuras cerebrales socava muchas doctrinas filosóficas sobre el estado incierto de las intuiciones” concluyen los investigadores (Woodward y Allman, 2007)

Por lo tanto, el reconocimiento crucial del sistema NvE es fundamental en toda reflexión bioética: introduce de *modo inmediato* el conjunto de percepciones reales, y ofrece el impulso para retroalimentar emociones positivas que *posteriormente* serán vinculados por la corteza prefrontal (CPF) en pos de reunir los elementos que definen la Mente Humana.

VIII. PALABRAS FINALES

Esperamos que reconocer y recuperar la validez de un sistema neuronal con características propias, desarrollado por el aprendizaje y la experiencia grupal, con toda la capacidad para consolidar la experiencia, y retroalimentar las emociones de modo positivo, constituya una contribución al fomento de conductas solidarias, cooperativas y tendientes al bien común que debieran caracterizar nuestra humanidad.

Aprender desde la infancia y adolescencia a *disfrutar* del arte, de una comida saludable, de cuidar de nosotros mismos y del entorno, y considerar tal disfrute como algo legítimo a lo que tenemos derecho por el solo hecho de ser humanos, conforman pequeños cambios iniciales pasibles de retroalimentar una transformación social más amplia.

La mirada antropológica puesta en lo social, se enriquece así con el análisis que fluye entre el motor de los afectos y el bien común, donde los aspectos

integradores de sistema von Economo impulsan los valores de solidaridad y cooperación que debieran caracterizar toda Sociedad humana.

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Human Right to Environment in Brazil: Democratic Access to Quality of Life and Dignity to Reach All?

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Summary- As an agent responsible for promoting sustainable development, the state has a role to contribute positively to an ecologically balanced environment, as this can act and interfere directly in the development and implementation of socioenvironmental policies. The environmental balance is one of the components of the desired sustainable development, it being included also a viable economy and a just society. The environment, in turn, must be understood as a fundamental part of the scope and enforcement of human rights, as the right to life, ecologically balanced environment and own sustainable development are key to the quality of life and the scope of the dignity of the human person. This work aims to show that the ecologically balanced environment and the quality of life of the social and environmental point of view is a human right and an obligation of the State, which should promote and provide it to the whole society.

Keywords: *human rights; environment; environmental equity; sustainability.*

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Summary- As an agent responsible for promoting sustainable development, the state has a role to contribute positively to an ecologically balanced environment, as this can act and interfere directly in the development and implementation of socio-environmental policies. The environmental balance is one of the components of the desired sustainable development, it being included also a viable economy and a just society. The environment, in turn, must be understood as a fundamental part of the scope and enforcement of human rights, as the right to life, ecologically balanced environment and own sustainable development are key to the quality of life and the scope of the dignity of the human person. This work aims to show that the ecologically balanced environment and the quality of life of the social and environmental point of view is a human right and an obligation of the State, which should promote and provide it to the whole society. Human Rights correspond to the fundamental rights of every human person, covering both individual aspects as well as its sense of community. Rights are indispensable for every human life which are based on historical principles as liberty, equality and fraternity, essential and indispensable to a decent life. Through research, it was found that the environmental protection is a decisive factor for the consolidation of the human right to sustainable development, as individuals need nature to fully develop in their living conditions.

Keywords: human rights; environment; environmental equity; sustainability.

I. INTRODUCTION

Man's actions toward the environment have caused serious changes on the planet and causing various problems whose effects reach and are felt in all parts of the world. For this reason, discussions about environmental issues have gained strength at the same time in which it operates as an agenda of government actions when the definition of public policies. Some factors such as the intensification of industrialization, population explosion, increasing production, unbridled consumption, urbanization and modernization of farming techniques also brought with it consequences such as degradation of natural resources, pollution of water, soil and air, which resulted in environmental disasters observed until days (BIRTH; Lemos; Mello, 2008). Because of these issues, we have tried to establish a new form of development, Not coincidentally, addressing environmental issues, Boff

(2012) notes that, these days, the theme of sustainability and the environment is one of the subjects most talked around the world, showing the importance that the issue has reached to society, businesses and governments. This is happening not only due to an outcrop of a perception of limited natural resources (which is already evident and is consolidating more each day), but also the understanding that an environment is a good that must be available to all people in a similar way, even in a timeless perspective.

In Brazil, the Government is in charge of shared responsibility to defend and preserve the environment, thus ensuring sustainable development at the national level, as defined in the 1988 Federal Constitution, in Chapter VI, which deals with the environment, as well as in other constitutional text devices.

Living in a preserved environment, quality of life and conditions that benefit people's health is a human right. However, given the current environmental context, how the state could act to benefit and promote a balanced environment and able to meet the current and future generation needs, thus ensuring that the right people?

It is important to understand the size of the environment related to human rights, given that, usually, there is a misperception that human rights are more linked to other aspects such as rights of prisoners, among other civil, understanding this that does not translate your concept. Therefore become important other approaches involving human rights in its various dimensions. Moreover, there is no way to treat human life without considering the environmental variable, the basis of its own existence.

As for the methodological aspect, this study corresponds to a literature review of work being categorized as to their nature, and qualitative research; the aims, defined as descriptive; and, as to the object, considered a literature search.

II. HUMAN RIGHTS

Comparato (2001) conceptualizes human rights as fundamental rights of the individual, covering not only the individual aspects as well as its sense of community, called fraternity rights. For Ramos (2014, p. 23), human rights "consist of a set of rights considered essential for

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human life, based on freedom, equality and dignity. Human rights are the basic rights and essential to the good life."

Human rights are rights attached to the condition of the human person. Ramos (2015, p. 38) understands that without these rights humans "cannot exist or is not able to develop and to participate fully in life." Although there is a certain list of rights that human beings need to have to have a dignified life (since human needs vary according to the historical and cultural context), there are elements that, over time, have been incorporated into what it is considered essential for it to be developed fully. Historically, these rights are marked by change and constant renewal, from antiquity to the present day and can be considered a product of history provided in accordance Ramos (2015) and Comparato (2001).

According to Ferreira Filho (2011, p. 57), human rights are classified into first, second and third generation (or size), corresponding respectively to the rights to freedom, equality and fraternity, basically the same motto of the French Revolution of 1789, theory advocated by Karel Vasak in 1979.

In this line, Ramos (2014) explains that the rights of "first dimension" are the rights of freedom, which are the individual, civil and political. The "second dimension" are those related to equal rights, whether economic, social and cultural rights, for example.

As Ferreira Filho (2011), the rights classified as "third dimension" (or generation) are the community ownership rights (solidarity and fraternity), which are linked to the quality of life and solidarity between human beings, including the rights relating to peace, development, the common heritage of mankind and the environment.

There's another doctrinal current, defended by Bonavides (2009), which proposes the existence of two other dimensions, namely: a "fourth dimension" of human rights (which he defends match the information rights, pluralism and democracy) and also a fifth dimension group (which corresponds to the fundamental right to peace). Another chain, further, argues that there is also a "sixth dimension", which is the human right to safe drinking water, as explained Santos (2001).

A landmark for human rights occurred in 1948 with the proclamation of the "Universal Declaration of Human Rights" by the United Nations (UN), a huge achievement for humanity in relation to their individual and universal rights. Among all posts rights from the document, it brought in its Art. 3 that has the right to "life", considering that it included the conditions necessary for its maintenance. Similarly, it is understood that every human being has the right to quality of life, as established in the art. 25 of that document. The preservation of the environment is therefore fundamental

assumption, without which even would not be possible life.

Unfortunately, the same way as other rights considered fundamental, it is known that this is a right yet achieved by few, although it is as important as the other (or even more), in need of protection with a range much bigger.

There is a disparity in access to a balanced environment. There is a discrepancy in the use of the environment as an instrument for the quality of life. Access to the environment for all cannot be seen also as something democratic, because it simply is not. Even there is a direct relationship between poverty / wealth and quality of life, as will be discussed later. The environment may even belong to everyone, but not everyone has access, either use it as a fundamental right to a quality life, and, why not say, with dignity.

In the light of our goal of study, it is interesting to note the Declaration of Human Rights of 1948 in it there is no mention on the environment. This shows that issues related to the environment at the time of its preparation, were not treated with due importance, or at least was not in evidence. What is the reason? The environment was not yet regarded as an asset to be preserved or a problem to be solved.

More than seventy years after the Declaration of Human Rights of 1948, which note is the environmental issue gaining prominence in discussions around the planet, as the human being has realized how much wear the natural environment directly affects their lives. The idea that natural resources are limited and increasingly declining lit the warning signal for people to begin to adopt a new attitude and a new mentality in relation to the environment, understanding that the destruction of nature is automatically the destruction of the human being.

III. ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

In recent centuries technological development of mankind has reached a level never reached in history. There were numerous scientific discoveries, which provided a huge production capacity by organizations, but at the same time, has caused wear on the unprecedented natural environment. The human being, through its unbridled pursuit of economic growth, made their discoveries and their technologies the means that may lead to its own demise.

The human being, of all existing animal species, is the one with the greatest capacity to adapt to the environment. Over time, man has modified the environment you live in, always in search of better living conditions. Unable to compete with other animals, because of their physical limitations, man learned to make tools as well as to overcome its limited capacity and offering the same the strength to deal with the

difficulties of the hostile environment in which he lived. At first, the ability to intervene in nature did not result in much damage. This activity that man exercising in nature to provide better living conditions and meet their needs given the name of work (DIAS, 2011). Over time, the interference capability in the medium in which living been expanded,

For Barbieri (2011, p. 01) "environment is anything that involves or about living things." According to this author, the environment comes from the Latin word and the ambi prefix means "around something" or "both sides". In this sense, the word environment brings the idea of involving living beings and things, and everything that surrounds the earth with its natural and artificial elements, "Why the environment is understood the natural and the artificial, that is, the environment unique physical and biological, and what has changed, destroyed and built by humans "(BARBIERI, 2011, p. 01).

It is due to the inordinate use of available resources in the environment, from the production of goods and services that humans have caused the greatest wear in nature, for this production generates waste and harm the natural environment, resulting in a difficult situation reversal. These resources used in production are classified into renewable and non-renewable: renewables are air, water, solar energy, plants, animals, etc.; non-renewable are those which have a finite amount and at some point will run out (such as ores, coal, petroleum, etc.).

Produce without thinking, sell without measure and consume without resetting the nature, they became the basic equation for the unsustainability today and threaten the structure of the planet. This dynamic must be rethought in order to ensure the existence of future generations with concrete possibilities to remain and live harmoniously with the environment, while ensuring the development of this.

The design limitation of natural resources has given rise to the need of the search for balance between the use of the environment as a source of wealth and economic and social development. Sustainability emerges as a fundamental condition for the maintenance of life on Earth and its basic idea ensure "that our actions today do not limit the range of economic, social and environmental options available to future generations" (Elkington, 2012, p. 52).

Currently, the concept of sustainability is widespread and is related to the planet's ability to maintain natural balance, taking into account the economic and social needs present and future generations. Therefore, sustainability cannot be analyzed in isolation in one of its aspects. It basically involves three variables that are complementary to each other, composing a social, environmental and economic system.

Sachs (2009) notes that "sustainability" is often used to express "environmental sustainability", but that term has other dimensions. For him, the first approach refers to the "social sustainability", which considers the very purpose of development as it considers it easier to place a social breakdown before it happens an environmental catastrophe. From there, the message "environmental sustainability", which primarily depends on the social, to then rise to "economic sustainability", which relates to the other "as an economic disorder brings social disorder, which, in turn, clogs environmental sustainability "(Sachs, 2009, p. 71).

The concept itself Sustainability varies according to the literature, but having the same essence, as this concept: "ensuring that natural resources remain with the quality and quantity of original levels over time and allow future generations to meet the same conditions for their survival than the current ", defines Floriano (2007, p. 11) the meaning of sustainability. In the same spirit, Elkington (2012, p 38) brings in its concept: "Sustainability is the principle which ensures that our actions today do not limit the range of economic, social and environmental options available to future generations."

Keeping the environment in balance environment is a condition for the full development of all societies. A healthy and balanced society is one that understands that their welfare is reached when considering in their actions not only the impacts they may have on the present, but also the effects that these actions can generate in the future. This is the concept of "sustainable development", defined by the report "Our Common Future" (also known as the Brundtland Report of the World Commission on Environment and Development, the UN in 1987) as "the ability of companies to meet needs of the present without compromising the ability of future generations to meet their own needs "(WCED, 1999, p. 09).

However, this understanding had already been signed since 1972, from the United Nations Conference on the Human Environment, which resulted in the Stockholm Declaration and the United Nations Environment Program (UNEP). This statement was also a milestone for environmental law when considering the right to the environment as a fundamental right of the individual, equating it to rights already established in the field of human rights, such as freedom and equality (first and second dimension). The document contained in Principle 1 that "the human being has the fundamental right to freedom, equality and the enjoyment of adequate living conditions in a medium whose quality permits a life of dignity and well-being come,

That statement also argues that when there is a relationship in which man protects nature, both are benefited, highlighting in its preamble: "Man is at the same time work and the environment builder that surrounds it, which gives material support and it offers

the opportunity to develop themselves intellectually, morally, socially and spiritually "(UN, 1972, sl). The same text also emphasizes that "the protection and improvement of the human environment is a key issue that affects the people well-being and economic development around the world, an urgent desire of the peoples of the world and duty of all governments" (UN, 1972, sl).

Days (2011) points out, however, that despite the Sustainable Development concept is widely used, there is an exact view of what it is. He explains that for some sustainable development is to achieve economic growth through the rational use of natural resources and more efficient and less polluting technologies; for others, sustainable development is, first and foremost, a social and political project to eradicate poverty, improve the quality of life of society and meet the basic needs of mankind.

Therefore, environmental protection emerges as a human right, whose responsibility belongs to everyone and global, including governments, organizations and society in general.

The full development of the human being depends on many factors, so that it can find the right condition for a life with dignity. The United Nations, to develop the concept of sustainable development brings with it a response attempt to existing environmental problems and risks that the planet runs due to this problem.

Although it seems easy to deal with the environmental issue it is not that simple. The own economic dynamics (directly linked to the use of natural resources) must be taken into account, since economic impact of actions bring therefore a social and environmental impact immediately. Ie economy, society and environment are in a direct, closely linked relationship. Issues related to the context emerge from it, for example, you can reduce wear in nature without affecting the economy? You can move the economy without affecting society? The fact is that it is impossible to move on these issues without impacting on human life, the living conditions of society and the well-being of individuals and cannot be considered any point without a holistic approach.

Therefore, "to be sustainable development should be economically viable, socially just and environmentally correct," as Boff (2012, p. 43), a concept also advocated by Elkington (2012), known as "Sustainability Tripod" (Triple bottom Line), which advocates exactly the balance between these three variables. Similarly, even the Stockholm Declaration (1972) also provides that: "Economic and social development is essential to ensure the man a living environment and favorable work [...]" (Principle # 8), also entailing the concept.

In Brazil, the Sustainability Tripod is a concept that can be applied both macro way, for a country or for

the planet, for example, as well as micro way, as in a house, a school, or business, regardless of size (DIAS, 2011). Sachs (2009, p. 35), in turn, calls the three pillars of sustainable development as "Victory Triple", to simultaneously meet the criteria of "social relevance, ecological prudence and economic viability."

Sachs (2009) emphasizes that to be sustainable development, biodiversity conservation is presented as a necessary condition, although it also seeks to reconcile the social and environmental objectives at the same time without losing the order of concern for the needs of the present generation and future generations. The author also provides an explanation of the difference between conservation and environmental protection, which although with similar meanings, have specifically distinct meanings, however, necessary for the understanding of the environmental issue. As states, the idea of preserving consists of preventive action for the protection of ecosystems against any damage or form of degradation. Keep in turn, is to enjoy, in a controlled manner, the assets and resources that nature can offer, in order to allow its continued use. In the same vein, Nascimento, Lemos and Mello (2008, p. 71) explain that environmental conservation "adopts the criterion of inatacabilidade man of nature and the ecosystem", while conceptualize environmental conservation as "the efficient use of a resource all in order to obtain a good yield, thus ensuring its renewal or self-maintenance." So save means the use of natural resources within the limits able to maintain quality and balance of nature; preserve, on the other hand, corresponds to not use and do not allow human intervention passed on to the environment. 71) explain that environmental conservation "adopts the criterion of inatacabilidade man of nature and the ecosystem", while conceptualize environmental conservation as "the rational use of means whatsoever, in order to obtain a good income, thus ensuring the renewal or self-sustaining. " So save means the use of natural resources within the limits able to maintain quality and balance of nature; preserve, on the other hand, corresponds to not use and do not allow human intervention passed on to the environment. 71) explain that environmental conservation "adopts the criterion of inatacabilidade man of nature and the ecosystem", while conceptualize environmental conservation as "the rational use of means whatsoever, in order to obtain a good income, thus ensuring the renewal or self-sustaining. " So save means the use of natural resources within the limits able to maintain quality and balance of nature; preserve, on the other hand, corresponds to not use and do not allow human intervention passed on to the environment. Save means the use of natural resources within the limits able to maintain quality and balance of nature; preserve, on the other hand, corresponds to not use and do not allow human intervention passed on to the environment. Save

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Elkington (2012) explains that the idea of sustainability, although not fully applied, is widely spread and its observation is considered a major impact on decisions in the business world. Although some executives assert that it is not his duty to save the world, it is widely realized the importance of the role of business as responsible for sustainable development.

Even as understanding Days (2011), the passage of predatory development to the stage of sustainable development has many implications. For the author, it changes the vision and the relationship of people with nature, where it is seen not as a mere supplier of raw material, but as the necessary environment to all human life. In addition, this new type of development involves the rational management of natural resources, while amending the productive and social organization that, over time, has produced and reproduced the existing situation of inequality and poverty, creating new values and taking the focus on profit and putting a priority the welfare of humanity.

However, Doinaire (2013) emphasizes that, in the case of Latin American countries, due to the numerous problems that affect the region (such as external debt, economic stagnation) comes up widening the gap between it and the developed world, there was a deterioration of a great deal of welfare standards of the population, with the production systems and degradation of the incidence of high inflation rates, causing environmental issue to be relegated to the background, with only a few isolated actions. He points out that before these issues becomes difficult to "convince those in power that the environment is a priority" (Doinaire, 2013, p. 30).

Doinaire (. 2013, p 30) further states that the issue of poverty has a direct influence on the environment: "Poverty means, among other things, important environmental deterioration process, as it is virtually ransacked according to basic needs the most needy. " Also points out that "pollution of the poor" is a key element in the environmental deterioration process, providing unprecedented element of environmental concerns, given its characteristics and scope, compared to the environmental problems of the developed world. This issue has a direct relationship to sustainable development, therefore, when considering the poverty factor in its analysis, you can see a difficult application, because the present generation is not being met even in their basic needs.

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IV. THE STATE'S ROLE

Living in a preserved environment, quality of life and conditions that benefit people's health is a human right. In Brazil, the Federal Constitution of 1988 addresses in its Chapter VI the Environment, which, in its Article 225 states that: "Everyone has the right to an ecologically balanced environment and of common use and essential to a healthy quality of life Laid both the Government and the community the duty to defend and preserve it for present and future generations." (BRAZIL, Art. 225, CF, 1988). This position shares the responsibility for ensuring environmental rights not only for the government but also the company itself, which is at the same time, transforming agent of the environment and also who is susceptible in this transformation.

Currently, one of the most direct ways that the state has to contribute to the preservation of the environment, while providing the company the right to sustainable development is through the tax institution, whose revenue can be used for the preservation and promotion the environment, as so-called environmental taxes (also known as ecological taxes), which are part of the so-called green economy.

Taxes are actually tools that the state has to obtain revenue, seeking from them, the appropriate application for the provision of services and development of public policy interest of the whole society.

The national development advocated in art. 3 of the Federal Constitution, will not be achieved in another way without the consideration of the environmental variable, carved in the Arts. 170 and 225 of our Constitution, the basic premise of sustainable development. In turn, is part of the government positively contribute to an ecologically balanced environment, via application of funds or tax incentives, since the state can act and interfere in the economy through the tax institution, whether with tax functions, quasi or extrafiscal.

As Machado Second (2018), the taxes with extrafiscal function are those established with goals that go beyond their own collections. They can be used in various ways, including the achievement of results in order to achieve the reduction of negative externalities (such as the preservation or conservation of the environment and the mitigation of negative impacts suffered) as part of a policy public socio-economic and

environmental development. The state action thus be guided to correct, minimize or even promote the protection of the environment, that is, is a way of inducing national development through an environmental tax policy.

In art analysis. 170, Item VI of the Constitution, which deals with the Economic and Financial Order, it may be noted that to ensure everyone a decent life, a fundamental human right, it should be considered as a basic principle the environmental variable:

Art. 170. The economic order, founded on the value of human work and on free enterprise, is intended to ensure everyone a life with dignity, according to the dictates of social justice, on the following principles:[...]

VI - environmental protection, including by differential treatment as the environmental impact of products and services and their development and delivery processes.

Brazilian realizes that the State had the concern to establish in its Constitution guiding principles of sustainable development as pillars of society, whereas the ecologically balanced environment is essential to achieve this development. This is a concern imbued with the spirit of solidarity / fraternity printed in the Preamble of the Charter itself Brazil's largest, as sustainable development is concerned not only with today, but also future generations and their welfare. The idea of promoting sustainable development is not only preserve the environment and promote development able to provide a quality of life for the whole society, but above all a matter of promoting the dignity of the human person.

V. FINAL

Human rights include a number of rights, ranging from the right to life, liberty, equality, and issues such as the environment. Classified into categories, called "dimensions" or "generations", the environment found in the third dimension of these rights.

The protection of the environment as an essential condition for the right to life, puts this right as part of those that underpin human rights.

Have an ecologically balanced and secure environment is key to economic development, which, in turn, is necessary for society to also develop to its fullest and enjoy a well-being.

It is from the balance between the economic, ecological and social variables that has sustainable development, the result set of actions of all walks of life and whose benefits are felt not only the present generation but also for future generations.

Responsibility for sustainable development is shared among multiple actors such as businesses, governments and society. In Brazil, the Government is the one responsible for all to have secured the right to an ecologically balanced environment, which is considered an asset of common use and essential to a

healthy quality of life, and the State and society the duty of defend it and preserve it for present and future generations.

In this work, the aim was to show that ecologically balanced environment and the quality of life is a human right and an obligation of the State, which should promote and provide it to the whole society.

Indeed, it was shown that the state has a very important role in preserving the environment and ensuring the human right to sustainable development, developing public policies to promote sustainable development and quality of life, while developing mechanisms through which investment is allowed for this purpose.

Finally, it is clear that in Brazil the actions involving the quest for the promotion and protection of the environment are still incipient, lacking expansion and implementation by the state, since it is no easy task allocate resources to an area that, despite from clear its importance, it is a perception that has not reached every society, yet. Many variables influence this scenario, as the population's education level, which shows that the higher the education, the greater concern for the environment. This is still a challenge for Brazil, as a well-informed population is more able to demand of the government such actions. And if the state can be inducer of these actions, the company itself may also, or even more so, since, as own the Federal Constitution (Art. 1, sole paragraph), "All power emanates from the people [...]"

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Invisible

By Elio Grazioli

Abstract- Invisibility has always been a fascinating theme for art but starting from Modernity - the novel *The Invisible Man* by H.G. Wells comes out in 1897 - has taken on new values and characters. Scientific progress and new theories have made it possible to imagine its real and not just magical realization, so that it has become something different from the pure subtraction to the visible. The visible, for its part, has also changed its characters and expanded its field, changes that have in turn been reflected on the conception of the invisible. The result is a significant recurrence of works by artists in the twentieth century in which the invisible has become no longer an oppositional term but a notion and a world of its own characteristics, a state not of denial but of affirmation within the visible itself.

Without indulging in the invisible as a metaphor but limiting itself to cases in which invisibility is actually taken on the explicit theme of works and reflection, the text constructs a path in twentieth century art to show the developments of this reflection. Starting from the Surrealism that finds in the invisible a metaphor of the unconscious functioning, then excellent examples have been found above all starting from the art of the 60s, conceptual, povera, that go well beyond the 'dematerialization' and the criticism modernist 'opticality', to then move on to the invisible architecture 'of certain minimalists; then we touch on the theme of camouflage and finally conclude with even more radical examples of the last decades.

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Invisible

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Without indulging in the invisible as a metaphor but limiting itself to cases in which invisibility is actually taken on the explicit theme of works and reflection, the text constructs a path in twentieth century art to show the developments of this reflection. Starting from the Surrealism that finds in the invisible a metaphor of the unconscious functioning, then excellent examples have been found above all starting from the art of the 60s, conceptual, povera, that go well beyond the 'dematerialization' and the criticism modernist 'opticality', to then move on to the 'invisible architecture' of certain minimalists; then we touch on the theme of camouflage and finally conclude with even more radical examples of the last decades.

Abstract- L'invisibilità è sempre stato un tema affascinante per l'arte ma a partire dalla Modernità - il romanzo *L'uomo invisibile* di H.G. Wells esce nel 1897 - ha assunto valori e caratteri nuovi. Progressi scientifici e nuove teorie ne hanno fatto immaginare la realizzabilità effettiva e non più solo magica, per cui essa è diventata qualcosa di diverso dalla pura sottrazione al visibile. Il visibile, da parte sua, ha esso pure cambiato caratteri e ampliato il suo campo, cambiamenti che si sono a loro volta riflessi sulla concezione dell'invisibile. Il risultato è una ricorrenza significativa di opere di artisti nel XX secolo in cui l'invisibile è diventato non più un termine oppositivo ma una nozione e un mondo dai caratteri propri, uno stato non di negazione ma di affermazione dentro il visibile stesso.

Senza indulgere nell'invisibile come metafora ma limitandosi a casi in cui effettivamente l'invisibilità è presa a tema esplicito delle opere e della riflessione, il testo costruisce un percorso nell'arte del XX secolo per mostrare gli sviluppi di tale riflessione. A partire dal Surrealismo che trova nell'invisibile una metafora del funzionamento dell'inconscio, si sono poi trovati esempi eccellenti soprattutto a partire dall'arte degli anni '60, concettuale, povera, che vanno ben oltre la 'smaterializzazione' e la critica all'otticità modernista, per passare poi all'architettura invisibile di certi minimalisti; si tocca poi il tema del mimetismo per infine concludere con degli esempi degli ultimi decenni ancora più radicali.

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INTRODUCTION

Entra in scena nelle vesti di un forestiero "durante l'ultima nevicata dell'anno, tra un turbinio di neve e folate di vento gelido"¹, il misterioso nuovo uomo invisibile di H.G. Wells, imbucato dalla testa ai piedi per nascondere la propria invisibilità. È l'opposto di quella prima di lui, ricercata per nascondersi e fornita da un qualche strumento magico, come l'elmo Tarnheim nell'*Oro del Reno* di Wagner. Segna il passaggio dalla magia alla scienza, che è quanto si incaricherà di raccontare il romanzo.

L'uomo invisibile esce nel 1897, un momento decisivo secondo Jean Clair², in cui si gioca in maniera evidente questo passaggio. Le invenzioni, il progresso della tecnologia, vi hanno un ruolo determinante che si ripercuote anche sull'invisibile. Nel 1895 Wilhelm Conrad Röntgen scopre i raggi x, i quali, invisibili all'occhio umano, mostrano in trasparenza l'interno del corpo; nello stesso anno Guglielmo Marconi scopre la radiotelegrafia senza fili, altre onde, irradiazioni che si propagano invisibili. (Di quello stesso anno è l'invenzione del cinematografo, il quale, sia detto tra parentesi, per rendere visibile il movimento nasconde all'occhio la realtà dei fotogrammi.) Su queste scoperte fanno leva una quantità di movimenti che vanno dallo spiritualismo allo spiritismo, dalla Naturphilosophie, che già postulava l'esistenza di irradiazioni invisibili che mettevano in comunicazione universi misteriosi e ultraterreni, agli esperimenti famosi del dottor Hippolyte Baraduc, che cerca di fissare su lastra fotografica l'aura emanante dalle emozioni o dagli incubi. Come ricorda Clair, l'espressione "iconografia dell'invisibile" si diffonde nella letteratura sia scientifica che parascientifica e occultista a cavallo dei due secoli. Molti sono anche gli artisti che se ne interessano o ne vengono influenzati per vie e in percorsi del tutto diversi, da Edvard Munch a Marcel Duchamp, passando per František Kupka, Wassily Kandinsky, Kazimir Malevič, Umberto Boccioni, Piet Mondrian e molti altri.

Sono poi soprattutto i surrealisti a rimettere in gioco questo mondo, rispolverando sedute medianiche, ipnosi, telepatia, in cui il "funzionamento reale del pensiero", secondo la famosa formula di André Breton³, slitta verso ogni sorta di premonizioni, anticipazioni, sogni, profezie, manifestazioni di un linguaggio che non procede per linearità e controllo, ma per analogie, condensazioni metaforiche, slittamenti metonimici e ogni sorta di cortocircuito sorprendente. L'inconscio è il regno del visivo, ma che rimanda incessantemente

all'invisibile, al surreale come dimensione altra. E così come l'inconscio è irrimediabilmente intrecciato al conscio, così l'invisibile è fin dentro il reale. La fotografia in particolare è allora usata dai surrealisti in questo senso, per vedere altro – l'iconografia dell'occhio, da quello tagliato in *Un chien andalou* (1929) a quelli moltiplicati nel ritratto della contessa Casati di Man Ray (1928), occupa un capitolo intero del Surrealismo – e indicare ciò che non vedo.

Mentre Paul Klee ha lanciato nel suo *La confessione creatrice* (1920) la famosa formula "L'arte non riproduce ciò che è visibile, ma rende visibile"⁴, aprendo un vaso di Pandora su che cosa possa significare 'rendere visibile' e che cosa è 'visibile', in ambito surrealista ci interessa segnalare almeno due casi particolari che danno il segno del cambiamento in atto. Il primo è sì di ambito fotografico, ma non della fotografia realizzata dai fotografi artisti bensì di alcune fotografie pubblicate sulla rivista ufficiale del gruppo, "La révolution surréaliste", foto anonime, trovate e ricontestualizzate in modo da significare altro. Due in particolare danno dell'invisibile una versione curiosa, ovvero quella di fuori campo: sulla copertina del numero 7 del giugno 1926 un gruppo di persone guardano tutte nella stessa direzione qualche cosa che non è nell'immagine, oppure, in un'altra foto sulla copertina del numero 11 del marzo 1928 (Fig. 1), un altro gruppetto guarda dentro un tombino aperto nel manto stradale. Cosa guardano? Cosa vedono? Per i surrealisti il fuori, il sotto, il dentro dell'inconscio; ma anche, per noi se non per loro, qualcosa di inaccessibile, qualcosa di misterioso, verrebbe da dire: nonostante loro, ignari.

L'opposto è il caso, diretto nel titolo, de *L'uomo invisibile* (1929) di Salvador Dalí (Fig. 2). È una delle sue 'figure doppie', qui doppiamente visibili e invisibili, ovvero composte da pezzi che danno forma a un'ulteriore figura se guardati non ciascuno separatamente ma nel loro insieme. Qui appare un uomo composto dai pezzi più disparati: nuvole per capelli, colonne, un nudo, un laghetto e poi altri elementi paesaggistici per il corpo. È l'uomo-inconscio: l'invisibile, come l'inconscio, non è l'opposto o l'assenza del visibile, ma è formato dal visibile stesso, da sue parti disposte in modo particolare, non logico, non abituale, eppure rispondente a un'altra logica, a una logica 'altra'; viceversa il visibile è solo un insieme di dettagli dai quali occorre individuare l'altra figura.

In un certo senso *L'oggetto invisibile* di Alberto Giacometti è il suo opposto: un vuoto, un'assenza, che sono anche un "creux", un negativo, uno spazio segnato dalla disposizione delle mani del personaggio che sembrano afferrare o attendere qualcosa che non c'è; è molto vicino al "niente" di cui, come vedremo, parla Wells nel suo romanzo, che fa paura, perché si sa che c'è qualcosa, ma non lo si vede: in Giacometti non fa paura, ma certamente turba. Tutto ruota intorno a

questa assenza. È l'arte stessa, la sua metafora: "invisibile ma presente", come dice Breton⁵, ma in un modo opposto a quello formato da altro di Dalí, perché del tutto non visibile, non fantasma, pura trasparenza, "cristallino" dice ancora Breton.

Alla fine degli anni '20 il Surrealismo entra in due interessanti collisioni: una in realtà in conflitto ed è il gruppo di Georges Bataille raccolto intorno alla rivista "Documents", che oppone un ferreo, 'basso' materialismo a quello che ritengono l'idealismo di Breton; la seconda è una confluenza momentanea ed è il gruppo raccolto attorno a un'altra rivista, "Le Grand Jeu", che prenderà poi un'altra direzione, di segno opposto, ovvero spiritualista. L'invisibile si può trovare eventualmente in quest'ultimo, con la sua poetica degli occhi chiusi – "Un nulla lucente un vuoto splendente / cieco-veggente delle tenebre bianche", scrive Gilbert-Lecomte⁶ – o forse nell'ambito della magia nella ripresa esoterica di Breton negli anni '40? Forse sì, ma senza essere preso in diretta considerazione. Resta sempre qualcosa di invisibile, qualche allusione o effetto infraviso nei surrealisti della seconda generazione. Si pensi ai flussi simil-fantasmatici dei dipinti di Roberto Matta degli anni '50.

René Magritte affronta il tema in diverse versioni curiosamente molto tardi, significativamente alla fine della sua vita, forse come meditazione sulla morte, ironica, come sempre, ma anche mesta sotto un certo punto di vista. In una versione, intitolata *Il paesaggio di Bauci*, del 1966 (Fig. 3), raffigura un personaggio a mezzo busto il cui volto è trasparente salvo i due occhi, il naso e la bocca che galleggiano sospesi tra cappello e colletto della camicia. Il rimando a Bauci, la compagna di Filemone nel mito raccontato dalle *Metamorfosi* di Ovidio può essere in effetti un rimando alla fedeltà (all'arte/nell'arte?) fino alla morte. Un'altra versione, intitolata *Il pellegrino*, dello stesso anno, vede il famoso personaggio con la bombetta senza la faccia, che è riportata spostata accanto, anche qui sospesa sullo sfondo. Anche il tema del pellegrino potrebbe essere una definizione della vita diretta verso la sua meta finale.

Sarà, quella di Magritte, una versione ironica, ma evidentemente il legame tra invisibile e morte riaffiora costantemente. In fondo non è l'anima, o lo spirito, da sempre la parte invisibile dell'essere umano, a cui segue la domanda su una possibile altra vita, sul dopo, sull'oltre? Fedeltà all'una e pellegrinaggio verso l'altra collegano i due paesaggi-luoghi.

Gli anni '30, anni di regimi repressivi, il dopoguerra e i '50, anni di ricostruzione e dell'imporre della massa e del consumo, fino a metà dei '60 non vedono esempi eccellenti di iconografia dell'invisibile. Qualcosa si potrebbe forse cercare nell'influenza dello junghismo su alcuni artisti, come il Jackson Pollock della prima metà degli anni '40, quando titola le sue

opere all'insegna di donne lunari, di guardiani di segreti, ma il rimando non è diretto; così come nel "sublime" in Barnett Newman o, chissà?, nel colore di Mark Rothko. O, al contrario, nel monocromo bianco di Robert Rauschenberg o nel *Silenzio* di John Cage⁷.

Prima di saltare a quando l'invisibile diventa di nuovo, ma ora in tutt'altra forma, argomento diretto, torniamo un momento al romanzo di Wells. Il suo uomo invisibile è in effetti molto particolare. Trasparente sì, ma quando si fa scoprire per la prima volta la reazione degli astanti è incentrata su un'altra osservazione: "Erano preparati a vedere un uomo, pieno di cicatrici, trasfigurato, orripilante, ma... non *niente*!"⁸ Niente, questo spaventa più di qualsiasi scempio o deformazione. Poi l'uomo invisibile fugge e se ne va in giro "nudo" per non essere appunto visibile e quando interagisce con qualcuno viene allora descritto dall'autore, chiamato addirittura, come "la voce", l'unico elemento percepibile, una voce disincarnata, senza fonte percepibile, puro suono, pura parola. Ma non siamo nella dimensione dell'astrazione, questo niente, questa trasparenza, questa voce sono pur qualcosa. È l'uomo invisibile stesso a ribadirlo: per quanto invisibile, resta uomo, ha gli stessi bisogni di tutti gli altri esseri umani, fa presente, è 'reale': "Reale come?", chiede il suo interlocutore. «Reale», risponde. E precisa: "In realtà, tutta la faccenda non è meravigliosa nemmeno la metà di quanto crede"⁹.

Ebbene, veniamo dunque al ritorno dell'invisibile. Siamo in ambito di quella che si sta affermando come Arte concettuale. La 'smaterializzazione' è uno degli argomenti messi in avanti per giustificarla, dalla critica Lucy Lippard¹⁰ come si ricorderà, ma in ogni caso il concetto è già qualcosa che sta alla sua traduzione materiale come l'invisibile sta al visibile, l'anima al corpo, secondo una certa dialettica consolidata. Questa premessa per dire in realtà che l'entrata in scena dell'invisibile forse è invece motivata dalla volontà di rottura di una dialettica che rischia da un lato di essere semplificatrice nella sua riduzione a due termini contrapposti, dall'altro che un terzo termine lo si vuole indicare come altro, piuttosto che come presunta sintesi. L'invisibile diventa allora un'altra dimensione, un altro modo d'essere, piuttosto che il non-visibile.

Prendiamo Robert Barry. La sua versione più famosa è quella della serie dei "gas inerti", del 1969 (Fig. 4), per definizione impossibili da cogliere non solo con la vista ma con tutti i sensi, che, ricordiamolo, furono semplicemente liberati nell'aria, "restituiti" cioè al loro ambito naturale¹¹, ma Barry aveva già lavorato prima con materiali trasparenti (*Outdoor nylon monofilament installation*, 1968), con onde radio e ultrasuoni (varie opere, 1968), con radiazioni (*Radiation Piece*, 1968). Ora, i problemi sono molti quando si osa tanto, quando si porta l'arte ai limiti. Uno è che con questi materiali

invisibili – portando al limite quello che all'epoca sta già accadendo con altre forme d'arte, dalla Land alla Performance per motivi diversi – occorre certificare che l'evento avvenga, che il gas sia liberato nell'aria, che effettivamente onde radio o ultrasuoni siano in atto, ed ecco che compare la fotografia, paradossalmente, perché chiamata a registrare qualcosa che non si vede e in realtà destinata a raffigurare qualcosa d'altro, l'azione, il luogo, la circostanza. Ma dove c'è un paradosso c'è uno spostamento, qui sta la chiave 'non dialettica'. Dice l'artista: "Benché questo" – il lavorare con materiali che definisce "non percepibili in maniera tradizionale" – "ponga dei problemi, apre anche delle possibilità infinite. È in questo momento che ho rigettato l'idea che l'arte debba obbligatoriamente essere qualcosa che va guardato". E ancora, con rimando diretto a un'altra percezione: "Non rimetto soltanto in causa i limiti della nostra percezione, interrogo la vera natura della percezione stessa. Non vi è dubbio che queste forme esistono, che sono controllate e possiedono caratteristiche proprie. Sono fatte di forme diverse di energia che esistono al di fuori dei limiti ristretti e arbitrari dei nostri sensi"¹². Percepire non ha a che fare necessariamente con il visibile – c'è qui una critica radicale all'"otticità" come carattere specifico dell'arte secondo Clement Greenberg, ma si va ben oltre – così come materiale non significa necessariamente materia palpabile.

Le onde, l'energia, e il pensiero – vedremo ancora fra un attimo – non sono materiali plastici? L'arte stessa, come ciò che fa di un oggetto un'opera d'arte e che da esso emana e si trasmette, non è una sorta di energia di questo ordine? Non sorprenderà che nello stesso anno dei gas inerti, il 1969, Barry sfiderà ulteriormente sia la materia che il linguaggio che il pensiero con *Telepathic Piece*: "Durante l'esposizione cercherò di comunicare telepaticamente un'opera d'arte che consiste in una serie di pensieri che non possono essere trasmessi per mezzo né del linguaggio né dell'immagine"¹³. Qui è dichiarata esplicitamente la ricerca di un invisibile come al di là del linguaggio e dell'immagine stessi, un non diventare immagine, un restare altro¹⁴.

In questa chiave si può prendere anche l'altra versione più radicale del concettualismo, quella di Ian Wilson che dal 1968 non produce più oggetti di alcun tipo ma pretende che i suoi discorsi o conversazioni in pubblico siano le sue opere: "Presento la comunicazione orale in quanto oggetto, tutta l'arte è informazione e comunicazione. Io ho scelto di parlare invece che scolpire"¹⁵. Parlare, cioè, è 'scolpire' vocalmente le parole e modellare le idee, è dare dimensione fattiva al pensiero. L'arte è 'cosa mentale', secondo il refrain leonardesco mille volte ripetuto, ma dove qui si sottolinea il sostantivo "cosa", una cosa tanto concreta quanto invisibile.

Un'altra versione è quella di Douglas Huebler, prettamente ma sottilmente fotografica. Che cosa può significare infatti fotografare l'invisibile? È che ci sono altri aspetti dell'invisibile e sono due aspetti fotografici, ovvero legati al tempo invece che allo spazio, alle cose: il tempo è invisibile, e in alcune sue occasioni lo è doppiamente, una è il caso, un'altra sono particolari istanti al limite.

Duration Piece #5, del 1969, è descritta come nata 'per caso': passeggiando a Central Park, macchina fotografica a tracolla, l'artista sente improvvisamente cantare un uccello, punta la macchina – reazione automatica, “come si fa solitamente in una situazione del genere” – e scatta, poi ne sente un altro e scatta di nuovo, così per una decina di volte. Che cosa ha fatto dunque? “Questo sistema era quindi basato su qualcosa di molto effimero ma anche di molto reale: il canto di un uccello (che non si vede) e le fotografie di un ambiente naturale. Queste foto del resto sono molto belle ai miei occhi perché sono del tutto arbitrarie”¹⁶. Possiamo dire che la fotografia registra il non visibile? Comunque non si tratta del non visibile in quanto tale, ma del fatto che quelle immagini – e l'immagine in sé per estensione – hanno senso a partire dal non visibile; se gli uccelli fossero visibili non avrebbero quel senso, sarebbero foto di genere, della banalità di quelle che si fanno al parco.

L'altra versione è *Duration Piece #31 Boston*, del 1974 (Fig. 5), che consiste in una fotografia raffigurante una donna nuda che si copre con un asciugamano, scattata – come spiega il testo che costituisce l'altra parte dell'opera – esattamente allo scoccare della mezzanotte del 31 dicembre 1973, per cui, calcolando il tempo di esposizione, metà della donna sta nell'anno 1973 e l'altra metà è già entrata nel nuovo anno. È un'immagine colta non solo in un 'tra' sospeso nel cambio di data, ma comunque sufficientemente lungo da essere diviso e da appartenere a due date, come una soglia che al tempo stesso separa e unisce, reale e insieme indefinibile, inafferrabile ma in realtà afferrato.

Qualcosa di questa idea dell'invisibile come ciò che coglie uno stato doppio c'è anche in Gino De Dominicis, in Giovanni Anselmo e in Alighiero Boetti. Nel 1967 De Dominicis presenta i cosiddetti “oggetti invisibili”, *Il cubo, il cilindro, la piramide*, consistenti nel tracciato a terra delle loro basi. L'oggetto non c'è, c'è solo la delimitazione dello spazio che occuperebbe. Viene da pensare al duchampiano piano di intersecazione in questo mondo tridimensionale di un corpo quadridimensionale che i nostri occhi non sono attrezzati a percepire interamente¹⁷, ma per De Dominicis si tratta di un'altra invisibilità, ancora più radicale e mentale, almeno nel senso che è tutta basata sul ragionamento che le supporta. Per De Dominicis infatti “le cose non esistono. [...] Per esistere veramente

le cose dovrebbero essere eterne, immortali, solo così non sarebbero solo delle verifiche di certe possibilità, ma veramente cose”¹⁸. La figura disegnata sul pavimento delimita allora quella che l'artista chiama una “illusione di presenza di oggetto”, ovvero uno spazio che nessun oggetto attraversa o in cui risiede. Ma, poiché lo spazio è appunto “dove un oggetto può muoversi o dove un oggetto risiede, là dove nessun oggetto si muove e dove nessun oggetto risiede non è spazio” e «ciò che non è spazio è oggetto»¹⁹.

Siamo di fronte a un'invisibilità che si basa sulla potenza del ragionamento, sul rigore della 'teoria' – dal greco *theoreo*, 'vedo' – così radicale da sovvertire le leggi della fisica naturale e del pensiero che su di essa fa affidamento, e dunque da apparire paradossale. Così il contorno e la stasi sono i bordi infrasottili dove gli opposti si rovesciano, il perno su cui ruotano: l'invisibile è il visibile in quanto non altro; l'invisibilità diventa il modo per mostrare la possibilità. Allo stesso modo, come indicano due famose opere seguenti, *Tentativo di volo* e *Tentativo di far formare dei quadrati invece che dei cerchi attorno a un sasso che cade nell'acqua*, entrambe del 1969, nella dimensione dell'infinito è – possibile che l'uomo spicchi il volo e che il sasso formi quadrati invece di cerchi nell'acqua²⁰. D'altro canto, di nuovo, l'arte non è questa dimensione che l'uomo fa 'vedere' dentro il reale?

La versione di Anselmo è diversa ma non distante. “L'invisibile”, dichiara, “è quel visibile che non si può vedere”²¹. È dunque dell'ordine del visibile, non della sua opposizione-negazione: c'è del visibile che non possiamo, non siamo in grado di vedere. Non si tratterà allora di cercare di renderlo visibile, ma di “materializzarlo”, dice l'artista, conservando la sua invisibilità. L'ha fatto in due modi. Nel 1971 realizza il primo *Invisibile* consistente in una diapositiva proiettata nello spazio espositivo che si vede solo se si intercetta il fascio luminoso alla distanza giusta, per esempio con una mano, su cui allora si legge la parola “visibile”. A vedersi resta dunque il visibile, ma la sua visione “rivela” che già esso in altro modo non si vedeva, dunque che dell'invisibile esiste, dipende dal modo. Il secondo tipo di *Invisibile* è del 1973 (Fig. 6) e consiste, in varie versioni, di due parallelepipedi o lastre di dimensioni diverse, uno più grande e l'altro molto più piccolo, distanziati qualche centimetro l'uno dall'altro in modo che nella parte mancante si sia portati a completare con “in” la parola riportata sulla più grande, che naturalmente è ancora “visibile”. È dunque l'“in” di “invisibile” a non essere visibile, ma l'assenza lo rivela come parte mancante.

D'altro canto si sarà notato anche che la particella “in”, se indica negazione-opposizione-rovesciamento come prefisso, significa anche dentro, tra, qual è appunto la sua posizione in questa versione. Più che di *coincidentia oppositorum* allora, forse

sarebbe più pertinente parlare di una dimensione altra che non siamo attrezzati a percepire visivamente ma sì in altro modo. È ciò a cui sembrano alludere le altre opere, alcune delle quali non a caso realizzate allo stesso modo, per proiezione o in due pezzi con assenza di "in": prima di tutto l'in-finito, ma anche la dissolvenza, la tensione... Il reale è solo un "particolare" che tende "verso il blu oltremare", come scandiscono altri titoli di sue opere.

Da parte sua Boetti propone un altro tipo di invisibilità, in particolare nell'opera *Lampada annuale*, del 1966 (Fig. 7). Si tratta appunto di una lampada che si accende, per un breve istante, solo una volta all'anno, in un momento imprecisato, casuale e imprevedibile. L'invisibilità consiste nella bassissima probabilità di poter assistere all'evento, che passa perlopiù inosservato, letteralmente non visto. La domanda allora è: esiste dunque ciò a cui non assistiamo? Basta l'attestazione del titolo? Il problema comunque è posto, quello dell'impossibilità di assistere veramente all'evento, che non mette in forse il suo accadimento ma lo sposta su un altro piano, quello della casualità, invece che della causalità, della *tyche*, secondo l'indicazione lacaniana, dell'incontro con il reale. Il reale²² è appunto ciò che si incontra come per caso.

Poi Boetti riprende la questione da un altro punto di vista in almeno due altre opere: nello stesso anno tende un telo mimetico militare su telaio (*Mimetico*) e nel 1969 realizza *Niente da vedere niente da nascondere*, un grande vetro – il rimando a Duchamp diventa evidente – su telaio di metallo. Né enfasi del mostrare, dello svelare, della visionarietà, né però copertura e nascondimento; trasparenza come stato di equilibrio, che lascia vedere e agire la griglia geometrica del telaio che dà ordine alla moltitudine caotica e casuale dei riflessi e delle presenze che vi traspaiono o vi si riflettono. Del mimetismo scrive Giovan Battista Salerno che è "precisamente una forma dell'invisibilità. Esso non rappresenta la natura, ma ne riproduce le tecniche di occultamento. [...] Ancora una volta la bellezza sta nella riproduzione, non nell'oggetto riprodotto, anche quando, come in questo caso, la riproduzione si avvale di un oggetto preso tale e quale direttamente dal mondo. In questo senso il *Mimetico* si può sempre considerare un ready-made, ma [...] il senso del *Mimetico*, la sua prassi, sta piuttosto nella delimitazione, nell'inquadratura dell'impensabile"²³. Mimetismo, prosegue Salerno, è dialettica di natura, macchia, opacità, ottusità – *La natura, una faccenda ottusa* sarà il titolo di altre opere di Boetti – e ordine, forma, trasparenza, acutezza.

Invisibilità e mimetismo sono evidentemente legati tra di loro, ma appunto nel senso che se il mimetismo tende a rendere l'oggetto invisibile, l'invisibilità allora può essere letta in termini mimetici, cioè non come scomparsa ma come presenza altra, strategia di

integrazione in un contesto, non necessariamente ostile ma di cui si mette in causa, si decostruisce la pretesa unica possibilità visiva, si offre una visione differente.

È quanto avviene anche nelle varie forme di quella che è stata chiamata da Birgit Pelzer "architettura invisibile"²⁴, di intervento indecidibile nello spazio. Così nel 1970 Michael Asher modifica gli spazi della galleria del Pomona College di Claremont, in California (Fig. 8), inserendo delle pareti nuove che trasformano le due stanze in triangoli isosceli e introducendo un controsoffitto digradante fino all'altezza dell'entrata, dalla quale è stata rimossa la porta, lasciando un'apertura quadrata che dà direttamente sulla strada. Certo, la stranezza della forma inconsueta delle stanze e dell'apertura sulla strada insospettiscono che qui stia l'intervento dell'artista, ma nient'altro distingue quello spazio da un altro spazio 'vuoto'²⁵. Nel 1973 alla galleria Toselli di Milano Asher si limita a scartavetrare pareti e soffitto della galleria, lasciando l'intonaco nudo. L'anno dopo alla Claire Copley Gallery di Los Angeles fa abbattere la parete divisoria tra lo spazio espositivo e l'ufficio della galleria. Lavori di ristrutturazione o opere d'arte? Niente di visivo permette di decidere e l'opera è inseparabile dal luogo in cui è realizzata, non solo *site specific*, ma è il luogo stesso, la sua percezione modificata.

Cosa ci mostra in questo modo Asher? Lo spazio, la luce, il contenitore espositivo, i meccanismi dell'esposizione? Ciò che è tolto? Ciò che è solitamente occultato, rimosso? Posto a metà strada tra la minimal art e il filone di critica istituzionale dell'arte concettuale, in queste sue operazioni Asher lavora al limite della percezione, quasi più sull'assenza che sulla presenza: l'asportazione della porta ci introduce in uno spazio che non è più interno in senso stretto, ma prolungamento coperto dell'esterno, letteralmente aperto; la mancanza del primo strato di parete rivela "il ruolo che ricopre la parete bianca nella percezione delle opere d'arte a cui fa da supporto"²⁶, quello che lì a poco O'Doherty chiamerà "white cube"²⁷; l'eliminazione della parete tra spazio espositivo e uffici mostra il funzionamento interno della galleria e insieme l'"astrattezza estetica" della fruizione dell'arte.

Alla Villa Panza di Biumo, a Varese, nel 1973-74 Robert Irwin (Fig. 9) e James Turrell aprono delle 'finestre', ovvero dei puri varchi senza cornice né altro dispositivo, nelle pareti e nei soffitti. Artisti della luce, come vengono definiti, ci mostrano diversamente ciò che non guardiamo mai in questo modo: la luce dentro lo spazio, il cielo come superficie luminosa. La materia impalpabile dell'opera è la luce, infrasottile energia ready-made. Come si rende visibile la luce? Cosa vediamo quando diciamo di vedere la luce? Essa è una sostanza-concetto limite. Come la finestra-apertura: né dentro né fuori, *in-between*, è la superficie soglia – ed è la soglia della storia dell'arte stessa, secondo la

definizione albertiana della pittura come finestra sul mondo²⁸. Togliere la cornice è qui togliere tutta quella storia, non isolare più l'oggetto opera, evidenziare il contesto 'per via di levare' invece che di aggiungere. Allora lo sguardo non è più quello che guarda un'immagine che sa essere d'arte perché incorniciata o un oggetto perché posto su un piedistallo o altro dispositivo, ma quello che nota una possibile incongruenza, una sfasatura minima, una situazione limite, una coappartenenza.

Anche certa musica detta minimalista in alcuni casi mira a una presenza così minima da essere stata chiamata 'environmental' o 'ambient' proprio perché tende quasi a sparire, o meglio a mescolarsi, secondo il dettato del *Silenzio* (1952) di John Cage, ad amalgamarsi, mimetizzarsi, con i suoni già presenti nell'ambiente. Sorta di versione sonora dell'invisibilità, di inudibilità, l'amalgama crea qualcosa di terzo, di diverso, dovuto all'inseparabilità dei due, una dimensione ulteriore, una 'possibilità'.

Forse l'esempio più consapevolmente radicale che integra insieme i due aspetti di intervento ambientale e intervento sonoro è l'operazione di Max Neuhaus in Times Square, del 1977 (Fig. 10). L'opera è talmente integrata nella piazza da risultare praticamente invisibile, presentandosi di fatto solo come una griglia di quelle che si trovano normalmente nei percorsi pedonali a copertura di interventi situati sotto il livello del suolo. Così è anche per l'installazione di Neuhaus, che comporta degli altoparlanti posizionati nella cavità sotto la griglia. Si trova in piena piazza, come parte integrante dell'arredo urbano, senza nessun genere di segnalazione né di cartello indicatore. I suoni che escono dagli altoparlanti, dal suolo, si mescolano completamente con i suoni dell'ambiente, certamente non silenzioso e anzi perlopiù tanto rumoroso da rendere quei suoni spesso indistinguibili. Essi sono comunque mescolati agli altri e mai separabili da essi, costituendone un insieme unico e sempre cangiante.

Giustamente è stato detto che più che di una composizione musicale si può parlare qui di una "scultura sonora": "La sonorità che l'artista ha prodotto non è dunque propriamente l'opera. Essa è, invece, una sottile tessitura uditiva disposta al centro di un teatro visuale quanto mai intrusivo, addirittura aggressivo, tessitura che risulta dall'intreccio di un insieme di frequenze sonore, molte delle quali sono ready-made e sfuggono al controllo dell'artista. Per contro, la forma stessa che prende la diffusione dell'opera nello spazio è estremamente disegnata e costruita, strutturata, tanto che si può parlare di una vera e propria scultura sonora"²⁹. Niente di solido, niente di visibile, ma una sorta di densità, non fosse che uditiva, se non concreta, di vibrazioni dell'aria, solo nella zona della griglia e non al di fuori di essa.

Nel 1985 anche Andy Warhol propone una *Scultura invisibile* (Fig. 11). Lo fa in un'occasione defilata, non ufficiale, ma a suo modo pop perché in un club, l'Area di New York, presentandosi per qualche minuto accanto a un cartello su cui era scritta la didascalia "Andy Warhol, Usa / Invisible Sculpture / Mixed media 1985" per poi andarsene: era invisibile quando c'era o dopo, è la domanda. E non appaia così scontata o pretestuosa perché in realtà c'è tutta una strategia di invisibilità che percorre l'opera e il comportamento di Warhol fin dall'inizio, che egli svela, o modula, proprio a partire da quegli anni attraverso la sua peculiare versione del mimetismo. Sono infatti dell'anno dopo, 1986, i suoi *Camouflage*, tele coperte dal pattern del telo mimetico militare, lo stesso di Boetti, ma con variazioni dei colori che lo adattano a ogni contesto. Da quel momento Warhol userà spesso lo sfondo di camouflage su cui sovrapporre le immagini scelte, in particolare il ritratto di Joseph Beuys, il proprio autoritratto e *L'ultima cena* vinciana, in una sequenza già in sé alquanto significativa di personaggi 'invisibili'. Che siano l'opposto dei divi dello spettacolo con cui ha cominciato e dei vanitosi uomini famosi che si fanno fare il ritratto su commissione dagli anni '70?

In chiave mimetica si può in effetti rileggere quasi tutta l'opera di Warhol, soprattutto a partire da quel 1963-64 in cui sembra aver preso decisioni radicali: dai film che registrano in inquadrature fisse volti o oggetti immobili alle simulazioni di scatole di prodotti vari, e poi avanti: i quadri dei fiori che coprono interamente le pareti, quindi le carte da parati su cui sono disposti i quadri con lo stesso soggetto, e poi i temi del travestitismo, del maquillage, per non parlare del doppio, della ripetizione, ecc. Nel 1984 realizza una serie di tele che riportano le tavole di Rorschach, ovvero macchie in cui ognuno individua delle immagini che in realtà sono le proiezioni delle proprie fantasie immaginarie. Il mimetismo ruota intorno a questi meccanismi della visione: il farsi macchia, il farsi superficie, secondo una delle più famose dichiarazioni di Warhol.

C'è una versione assurda, grottesca, che mostra con ironia un po' sbarazzina, con quel rimando probabile alle barzellette, ma radicale nel suo mettere in causa la credulità che vi è in gioco, tutta la parados-salità che in realtà sottende la nozione di invisibile. È quella di Maurizio Cattelan, che nel 1991 denunciò ai carabinieri il furto dall'auto della fidanzata di una sua scultura invisibile destinata a un'esposizione, per poi esporre il verbale della denuncia regolarmente steso senza alcuna obiezione all'impossibilità di quanto dichiarato (*Untitled (Denuncia)*, 1991) (Fig. 12). Esporre l'invisibile è impossibile; oppure esporre non significa necessariamente mostrare, bensì affermare, dichiarare, enunciare, 'denunciare' appunto. In realtà, a leggere il verbale, la parola "INVISIBILE" è riportata tra virgolette, e

tutto maiuscolo, potendo così essere considerata il titolo dell'opera: allora esporre l'"INVISIBILE" diventa un'altra (im)possibilità.

Ma qui inoltre l'invisibile ha anche a che fare con il furto – tema che ricorrerà anche nell'opera posteriore di Cattelan –, ovvero il furto della visibilità. L'anno prima Cattelan aveva dato un'altra versione della galleria vuota, chiudendola ed esponendo un foglio – un altro foglio sostitutivo dell'opera – con scritto "Torno subito". Dov'è l'artista? Dov'è l'opera? Dov'è l'arte? Sottratta più che assente: c'è e non c'è, c'è ma non è quella che ci si aspetta, è altra.

Concludiamo con due varianti del tutto singolari per rarità e per concezione in entrambi i casi. Il primo: alla Biennale di Venezia del 2013 Luca Vitone presenta un'opera intitolata *Per l'eternità* (Fig. 13). Si tratta di un profumo diffuso nella stanza. Altri artisti hanno usato odori e profumi, ma sempre emananti da oggetti o sostanze presenti e visibili; quella di Vitone è invece la versione radicale, del tutto invisibile. Per lui l'invisibilità è lo sviluppo dei suoi monocromi –realizzati con la polvere dei luoghi, di cui l'eternit è una variante per le sue 'polveri sottili' –, con spostamento dal visivo all'olfattivo. Spostamento decisivo, che si inserisce di nuovo in quel filone di critica dell'"otticità" di cui si è già detto e che qui è solo l'aspetto centrale di una riflessione ulteriore sul Modernismo. L'eternit, il cui nome rimanda a un'ambizione di eternità ripreso nel titolo dell'opera, è infatti qui il simbolo della "parabola modernista del '900"³⁰: inventato infatti come materiale risolutivo dal punto di vista funzionale ed economico, si rivela poi un veleno letale e diffuso.

Il profumo di Vitone invade la stanza, la quale appare di nuovo vuota ma è al contrario del tutto piena, "un pieno assoluto"³¹, insiste l'artista, tanto da chiamare *Per l'eternità* una "scultura olfattiva", "un oggetto che vuole essere enorme, gigantesco, che possa travalicare i confini della stanza, ma invisibile"³². Un oggetto inafferrabile, travalicante le dimensioni, che allude dunque ad ulteriori dimensioni, così come l'ulteriore particolarità di questo odore: l'eternit infatti non ne ha propriamente uno, è inodore, quindi quello di *Per l'eternità* è 'inventato', non nel senso di arbitrario ma appunto in quello di rimando ad altro, carattere intrinseco di una certa idea di invisibilità.

L'ultima variante infine consiste nell'invenzione di situazioni reali ma di fatto non direttamente esperibili. Si tratta dell'opera del croato Tomo Savic-Gecan, artista radicale che, come Tino Sehgal, non ammette riproduzioni delle sue opere, che nei cataloghi sono sostituite da brevi frasi secche e descrittive, stampate sempre con lo stesso carattere. È che nel suo caso le sue opere, tutte intitolate *Senza titolo* seguito dall'anno, sono di fatto e programmaticamente irriproducibili. Per esempio: i visitatori che entrano in una mostra a Utrecht mettono in movimento senza saperlo una scala mobile

situata in un centro commerciale a Zagabria (*Senza titolo*, 2001); "Per tutta la durata della 51a Biennale di Venezia, l'entrata di ogni visitatore nel centro d'arte contemporanea W139, ad Amsterdam (Paesi Bassi), modifica di 1°C la temperatura dell'acqua dello Sportdikhubi Reval-Sport, a Tallinn (Estonia)" (*Senza titolo*, 2005); "La vetrata della galleria è stata trasformata in vetri" (*Senza titolo*, 2005); "Il valore di quest'opera è l'opera; questo valore si trova in un costante stato di svalutazione a partire dall'apertura fino alla chiusura della mostra, momento in cui non varrà più niente" (*Senza titolo*, 2007); due spazi cubici bianchi identici e vuoti vengono allestiti uno a Parigi e uno a Bergen, in Norvegia, ognuno restringentesi impercettibilmente di mano in mano che entrano spettatori nell'altro spazio (*Senza titolo*, 2010). Luoghi differenti, cambiamenti impercettibili, trasformazioni, nessun oggetto prodotto o presente, il lavoro è composto su eventi reali ma non documentabili visivamente e non verificabili da parte dello spettatore che trova soltanto un foglio con scritte come quelle citate.

La critica del primato del visivo, la messa in discussione delle categorie formali estetiche – oggettualità, presenza istantanea, immutabilità, autonomia, valore – così come delle convenzioni espositive e di ogni assunto del 'sistema dell'arte', fin nei suoi aspetti mercantili, "senza tuttavia ripiegare completamente sulle 'idee pure' dell'arte concettuale"³³, sono solo gli aspetti critici della sua opera. Savic-Gecan non espone il vuoto, né rimanda a un concetto, non privilegia il linguaggio verbale invece di quello visivo, non mira a riduzioni né sottrazioni, in realtà ha individuato dei fenomeni, delle modalità, degli eventi del tutto reali anche se non visibili o a cui non si può assistere seguendo le condizioni prescritte dall'opera. Questi fenomeni-modalità-eventi anzi seguono delle regole e descrivono un'estetica e dei contenuti come qualsiasi altra opera, ma in modo finissimo e ancora una volta reinventandoli. Il lavoro sul tempo e sullo spazio, sulle materie e le loro trasformazioni o cambiamenti non solo rende 'visibile' in modo non visivo ma differente, immaginativo-mentale e anche effettivamente differito, ma agisce non a caso sugli stessi motivi che ricorrono in molti degli artisti e delle opere qui trattati. In particolare il doppio, a diversi livelli – degli spazi, dei pubblici, dei tempi, dei materiali, dei dispositivi, dei modi –, cosicché ciò che accade da una parte o all'uno non è accessibile all'altro eppure lo trasforma o ne viene trasformato. Questo inoltre in modo più fisico e letterale di quanto si sarebbe portati a pensare, perché realmente e fisicamente collegati.

Qualcosa avviene realmente e attira l'attenzione sulla letteralità delle condizioni del suo accadere, appunto lo spazio, il tempo, il luogo espositivo, l'esposizione, la condizione dell'artista, quella dello spettatore, quella dell'opera, del mercato, del contesto; ma è

letterale anche nel senso che si riduce alla propria presentazione, senza rappresentazione, senza immagine, senza illustrazione, senza figura. Questa presentazione tuttavia, per la sua invisibilità, mette nella condizione di pensare a un altro spazio, un altro tempo, un altro luogo, un'altra materia, un'altra forma. Scrive giustamente Elena Filipovic: "Cosa accade se un'esposizione comincia e finisce senza che il contributo di un artista che vi partecipa [...] possa essere vista, sentita o verificata in un qualche modo? Cosa accade se non si rivela come oggetto estetico se non in un *altro* tempo e un *altro* luogo, e che tuttavia la sua 'partecipazione' a un'esposizione (e la partecipazione del visitatore) in un determinato momento è essenziale alla sua 'esistenza'?"³⁴. Appunto si fa esperienza dello sdoppiamento, del ritardo, della differenza, per quanto sottilissima, necessari per un'esperienza estetica. Lo spettatore stesso si sdoppia: non fa mai esperienza direttamente di ciò che viene dichiarato e che accade, ma sempre attraverso un altro a cui viene collegato dall'operazione artistica.

Forse si potrebbe dire che l'invisibile consiste proprio in questo mettere in rapporto, in questo collegare, mostrare il collegamento, il far parte di una stessa realtà, altra, impalpabile, differente, che viene rivelata solo in questo modo.

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15 Mars 1928

LA RÉVOLUTION SURREALISTE



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Fig. 2: Salvador Dalí, *L'homme invisible*, 1929. Museo Nacional de Arte Reina Sofia, Madrid.

Fig. 1: Copertina del n. 11 della rivista "La révolution surréaliste", marzo 1928.

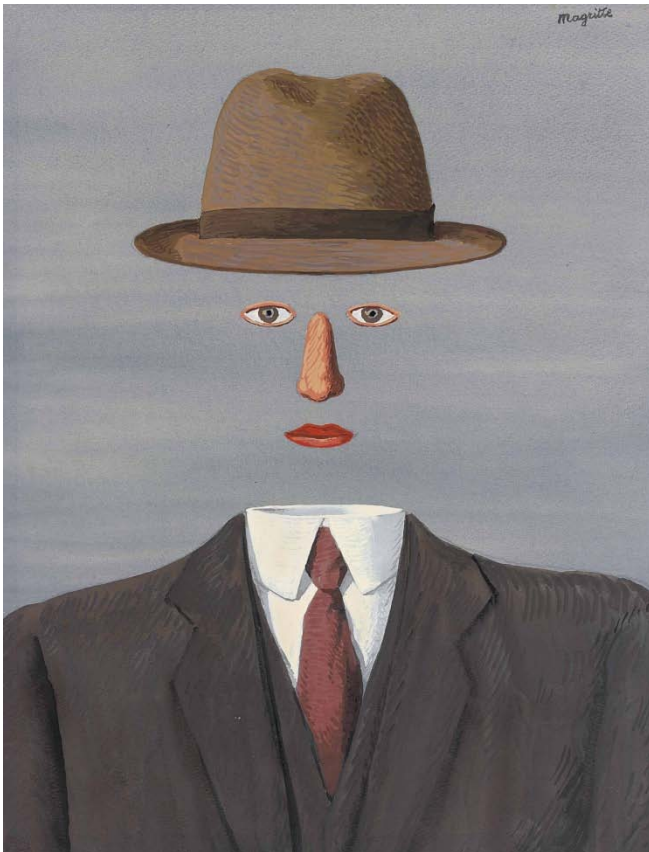


Fig. 3: René Magritte, *Il paesaggio di Bauci*, 1966. The Menil Collection, Houston.



Fig. 4: Robert Barry, *Gas inerte elio deserto del Mojave*, 1969.



Fig. 5: Douglas Huebler, *Duration Piece #31 Boston*, 1974.



Fig. 6: Giovanni Anselmo, *Invisibile*, 1973.



Fig. 7: Alighiero Boetti, *Lampada annuale*, 1966.



Fig. 8: Michael Asher, *Pomona College, Claremont*, 1970.



Fig. 9: Robert Irwin, *Varese Scrim*, 1973. Villa Panza, Varese.



Fig. 10: Max Neuhaus, *Times Square*, 1977.



Fig. 11: Andy Warhol, *Scultura invisibile*, 1985.



Fig. 13: Luca Vitone, *Per l'eternità*, 2013. Collezione Eric Guichard, Londra. Foto Roberto Marossi.

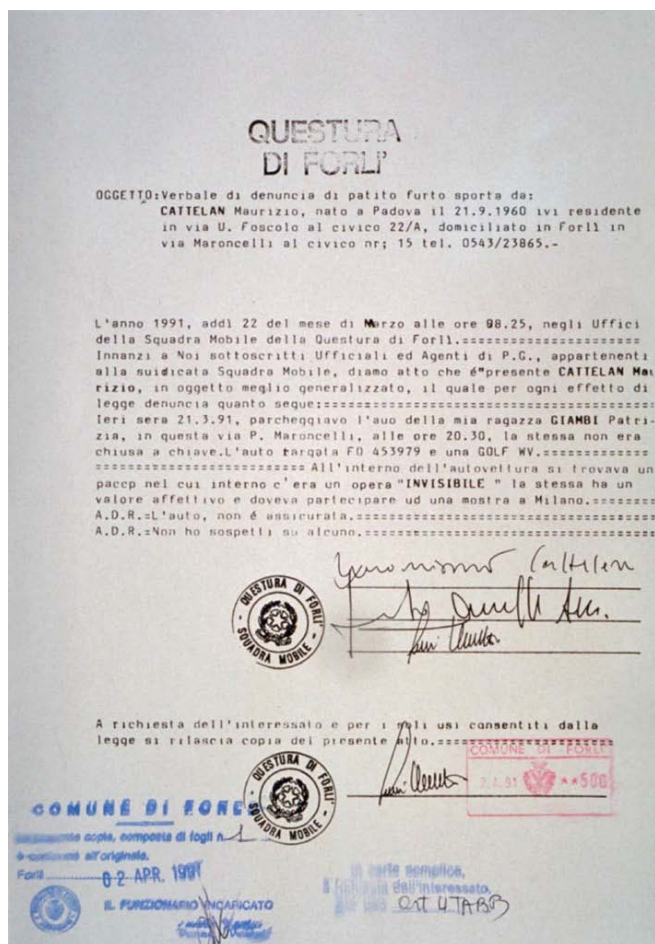


Fig. 12: Maurizio Cattelan, *Senza titolo (Denuncia)*, 1991.

- ¹ H.G. Wells, *L'uomo invisibile*, trad. it. Milano, Mursia, 1998, p. 27.
- ² Jean Clair, *Hybris. La fabbrica del mostro nell'arte moderna*, trad. it. Monza, Johan & Levi, 2015, pp. 21-37.
- ³ André Breton, *Manifesto del Surrealismo (1924)*, trad. it. in Id., *Manifesti del Surrealismo*, Torino, Einaudi, 2003, p. 30.
- ⁴ Paul Klee, *La confessione creatrice*, trad. it. in Id., *La confessione creatrice e altri scritti*, Milano, Abscondita, 2004.
- ⁵ André Breton, *L'Amour fou*, trad. it. Torino, Einaudi, 1934, p. 31.
- ⁶ Roger Gilbert-Lecomte, *"L'incantesimo perpetuo"*, trad. it. in *Le Grand Jeu*, Milano, Adelphi, 2005, p. 163.
- ⁷ Vedi il mio *Infrasottile. L'arte contemporanea ai limiti*, Milano, Postmedia Books, 2018, pp. 25-28.
- ⁸ H.G. Wells, *L'uomo invisibile*, cit., p. 63.
- ⁹ Ivi, p. 75.
- ¹⁰ Il riferimento è a Lucy Lippard (a cura di), *Six Years: The dematerialization of the art object*, New York, Praeger, 1973.
- ¹¹ *Returned* è il termine che usa Barry. Vedi Frédéric Paul, *I always do what I say I'm going to do. Robert Barry, point par point*, in "Les Cahiers du Musée national d'art moderne", n. 118, inverno 2011-2012, p. 27.
- ¹² Robert Barry in Arthur Rose, *Quatre entretiens*, in "Arts Magazine", n. 43-44, febbraio 1969.
- ¹³ Molto rare sono le opere che fanno riferimento alla telepatia. Noi pensiamo anche qui a Duchamp, o meglio a Robert Desnos che si diceva in collegamento telepatico con Rose Sélavy che gli trasmetteva i suoi famosi giochi di parole (1922); poi a *Telepathic Music*, una composizione musicale di Davide Mosconi del 1962; a varie versioni di Robert Filliou di *Musique télépathique*, dal 1976 – e si noterà che si è passati alla 'musica', sicuramente tramite Cage –; infine forse alla telepatia alludeva Douglas Gordon con la sua *Istruzione*, nel 1994, in cui durante la sua personale alla galleria Bonomo di Roma, ogni giorno rispondeva a chi chiamasse in galleria: "Io so a cosa stai pensando".
- ¹⁴ Rimando ancora al mio *Infrasottile*, cit., in cui molte di queste questioni, autori e opere sono trattati dal punto di vista della nozione duchampiana del titolo.
- ¹⁵ Ian Wilson in *Conceptual Art and Conceptual Aspects*, catalogo della mostra al New York Cultural Center, 1970, p. 33.
- ¹⁶ Irmeline Lebeer, *Douglas Huebler. Le monde en jeu*, in "Chronique de l'Art Vivant", n. 38, aprile 1973; ora in *L'art? C'est une meilleure idée! Entretiens 1972-1984*, Marsiglia, Jacqueline Chambon, 1997, pp. 119-120.
- ¹⁷ Sulla intersezione dei piani vedi Jean-François Lyotard, *Les TRANStormateurs DUCHAMP*, Parigi, Galilée, 1977.
- ¹⁸ Gino De Dominicis, *Lettera sull'immortalità – Roma, 10-9-1970*, ripresa in Achille Bonito Oliva (a cura di), *Gino De Dominicis. L'Immortale*, catalogo della mostra al Maxxi di Roma, Milano, Electa, 2010, p. 87.

¹⁹ Gino De Dominicis, *Lettera sull'immortalità – Roma, 10-4-1970*, ripresa in Achille Bonito Oliva (a cura di), *Gino De Dominicis. L'Immortale*, cit., p. 90.

²⁰ Così nel 1979 De Dominicis esporrà alla galleria Pieroni di Roma diverse versioni della *Persona invisibile*, sia in piedi che distesa, costituite ogni volta da un cappello e da calzature, legando il tema dell'invisibilità a quello dell'immortalità.

²¹ Giovanni Anselmo citato in Beatrice Merz (a cura di), *Giovanni Anselmo*, Modena, Hopefulmonster, 1989, s.n.p.

²² Vedi Jacques Lacan, *Il seminario. Libro XI. I quattro concetti fondamentali della psicoanalisi*, trad. it. Torino, Einaudi, 1979, pp. 54-57.

²³ Giovan Battista Salerno, *Arte della copia e misteri della riproduzione*, in ivi, s.n.p.

²⁴ Birgit Pelzer, recensione a Anne Rorimer, *Michael Asher: Kunsthalle Bern*, 1992, in "Les Cahiers du Musée national d'art moderne", n. 125, autunno 2013, p. 111.

²⁵ Naturalmente è inevitabile il rimando all'esposizione della galleria svuotata intitolata *Il Vuoto* di Yves Klein, del 1958.

²⁶ Michael Asher, *Writings 1973-1983 on Works 1969-1979*, citato in Peter Osborne (a cura di), *Arte concettuale*, Londra, Phaidon, 2006, p. 175.

²⁷ Vedi Brian O'Doherty, *Inside the White Cube*, trad. it. Monza, Johan & Levi, 2012.

²⁸ Thierry Davila ricorda tre finestre ciascuna a suo modo invisibile, in particolare poiché «mettono la percezione alla prova dei suoi limiti»: la prima è *Window Wash* di Gordon Matta-Clark, del 1973, una finestra, come dice il titolo, lavata senza che niente la indichi come opera d'artista; la seconda è *Placing Pillows* di Francis Alÿs, del 1990, un altro intervento non segnalato, consistente nell'inserire dei cuscini nei riquadri vuoti, cioè senza vetro, di alcune finestre sparse per Città del Messico; la terza è *Home Run* di Gabriel Orozco, del 1993, quando l'artista chiese agli abitanti degli appartamenti con affaccio sul Museum of Modern Art di New York di esporre un'arancia sul davanzale esterno delle loro finestre. «Il lavoro dell'arte», conclude Davila, «è allora e più che mai votato a mettere i sensi – termine che va qui inteso al tempo stesso come sensazione e come significato – al lavoro, a condurli a fare della percezione un atto di riconoscimento e di delimitazione dei fenomeni del mondo tanto più alterante in quanto suppone un vero e proprio divenire del senziente secondo la finezza, la quasi sparizione o la quasi assenza del sentito» (Thierry Davila, *De l'inframince. Brève histoire de l'imperceptible de Marcel Duchamp à nos jours*, Parigi, Éditions du regard, 2010, pp. 14-16).

²⁹ Thierry Davila, *Max Neuhaus, Time Square*, in "Art Press 2", n. 5, maggio-luglio 2007, p. 43.

³⁰ Intervista a Luca Vitone, in "Abitare Web", 3 giugno 2013, <https://www.youtube.com/watch?v=VujsktGNOuU>.

³¹ Verga Francesca, *Conversazione con Luca Vitone*, in "atpdiary.com", 2014, <http://atpdiary.com/exhibit/luca-vitone-n-b-k-berlino/>.

L'assolutezza qui in Vitone è legata al suo lavoro sui "luoghi" ancor più che sullo spazio, ovvero qui il riempimento della stanza è il corrispettivo delle sue piantine in scala 1:1, delle sue "cartine atopiche" e altro, tanto che egli, nell'intervista citata su "Abitare Web", afferma di aver con il profumo anche trasportato un luogo, Casale Monferrato, maggiore produttore di eternit e sua maggiore vittima, in un altro luogo, quello espositivo.

³² *Ibidem*.

³³ Elena Filipovic, *Les choses sont ce que nous rencontrons, les idées ce que nous projectons*, in Tomo Savic-Geca, *Untitled 2010*, Parigi, Jeu de Paume, 2010, p. 19.

³⁴ Ivi, p. 21.

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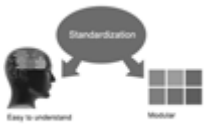
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11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

19. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.



20. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

21. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

22. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.



The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

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As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- o Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- o In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- o Present a background, such as by describing the question that was addressed by creation of an exacting study.
- o Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- o Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- o Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- o Do not include raw data or intermediate calculations in a research manuscript.
- o Do not present similar data more than once.
- o A manuscript should complement any figures or tables, not duplicate information.
- o Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."



Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- o You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- o Give details of all of your remarks as much as possible, focusing on mechanisms.
- o Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- o One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- o Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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	A-B	C-D	E-F
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<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



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