TOWARDS UNDERSTANDING CREATIVITY
A hypothesis about the creative process and the education in Architecture

by
MANUEL MARIA GIMENEZ ABENTE
Arquitecto, Universidad Nacional de Asunción
Asunción, Paraguay

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Signature of the author
Manuel María Giménez Abente
Department of Architecture
May 5, 1983

Certified by
Waclaw Piotr Zalewski
Professor of Structures

Accepted by
N. John Habraken
Chairman, Departmental Committee on Graduate Students

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ABSTRACT

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Manuel María Giménez Abente

Submitted to the Department of Architecture on May 5, 1983 in partial fulfillment of the requirements for
the Degree of Master of Science in Architecture Studies.

This thesis presents a hypothetical vision of
creativity as an integrative process allowed by the
organic human nature; by the way the human being is
organized in aspects and systems from whose
interaction six creative abilities would emerge:
questioning, understanding, intuition, idea, fantasy,
and imagination.

The first chapter is a sort of brainstorming that
leads to an understanding of how poorly the culture
presents its conception of man, and how necessary it
is to conceive man in his whole complexity, in order
to comprehend, not only his behavior, but also his
making.

The second chapter is a hypothetical proposal for a
more complex vision of human nature. A vision
elaborated by the association of elements that
although being known, are not commonly recognized as
being related.

The third chapter presents the six creative abilities
as a result of the functioning of two systems in
man—the emotive and the sensitive—which are part of
his organic nature. Creativity is explained as an
integrative action that man has to allow to happen by
throwing down obstacles that impair the integration
of such abilities. Creativity is also presented
here, from the point of view of the Arts and the
Sciences, concluding that processes are similar in
both, only their approaches being different.
The fourth chapter is oriented towards Architecture and education in relationship to creativity. Analyzing first, how the practice in Architecture demands the approach of both the Arts and the Sciences. Presenting then, how civilization and culture evolve by reinforcing the aspects of the organic human nature; and how, in an analogous way the educational process needs to reinforce other aspects. The education in Architecture also needs to accompany this cycle, in which the rule is not "how to develop creativity," but instead "how to adapt to the steps that creativity follows," in order to let it happen. The issue is not then "creative process within architectural education," instead it is "Architectural education within the creative process."

The conclusion emphasizes some points from the previous chapters, and also presents other relationships that emerge when looking at the four chapters together.

Thesis Supervisor: Waclaw Piotr Zalweski
Title: Professor of Structures
FORWARD

As I am more interested in learning about the gaps that methodology and implementation cannot thoroughly cover, and as I had been working in the Building Systems Group of the S.M.Arch.S. Program, I began this thesis as a case study of the influence of intuition in structural design. I was aiming at the point where the innovative structural system is conceived, and where basic decisions are made without yet being tested—the creation.

During my research I was led to issues that I did not expect to study. My advisor, Professor Waclaw Piotr Zalewski provided me with highly inspiring material from Robert E. Ornstein, Julian Jaynes, and James L. Adams. Relationships started to appear in my mind, connected with some information that I had accumulated in a period of training in practical psychology, with Dr. Jose Luis Romero Villar, S. J., from whom I learned much.

I decided to follow this associative labyrinth. I let myself change the thesis topic and title before the evidence that it was "creativity" instead of "intuition" what I needed to investigate. During a long period I did not know where these associations were leading me to, nor did I know how I was going to explain them. Fortunately, they coalesced—quite naturally to my belief—when, while searching concepts about creativity in other cultures, Professor Gunter Nitschke advised me to read a chapter of Unio Mystica, talks by Bhagwan Shree Rajneesh.

I want to thank Professor Waclaw Piotr Zalewski for two reasons. First, for having the talent of providing me with the material that led me to this topic, without my having asked for it. And second, for letting me write this paper in the way I needed to do it.

I also want to thank my friend William Frehse, who read my manuscript, corrected its syntax, and its spelling, and made valuable suggestions in order to make it more understandable.
# TABLE OF CONTENTS

## INTRODUCTION

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>6</td>
</tr>
</tbody>
</table>

## CHAPTER I

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Approach to Creativity</td>
<td>13</td>
</tr>
<tr>
<td>2. Resources from the Humanities</td>
<td>17</td>
</tr>
<tr>
<td>3. Operating in the World of Ideas</td>
<td>20</td>
</tr>
<tr>
<td>4. The Idea or Model That Man Has of Himself</td>
<td>23</td>
</tr>
<tr>
<td>5. The Main Obstacles to the Analysis</td>
<td>25</td>
</tr>
<tr>
<td>6. Additional Comments on the Humanities</td>
<td>27</td>
</tr>
</tbody>
</table>

## CHAPTER II

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Physical Nature of Man</td>
<td>30</td>
</tr>
<tr>
<td>2. From Instincts to Motivations</td>
<td>35</td>
</tr>
<tr>
<td>3. Completing Man's Diagram</td>
<td>40</td>
</tr>
<tr>
<td>4. Consciousness and Sub-Consciousness</td>
<td>45</td>
</tr>
<tr>
<td>5. Left Handed and Right Handed Thinking</td>
<td>49</td>
</tr>
<tr>
<td>6. The Functions of the Emotive and the Sensitive Systems</td>
<td>52</td>
</tr>
</tbody>
</table>

## CHAPTER III

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Abilities in Creating</td>
<td>57</td>
</tr>
<tr>
<td>2. Creativity</td>
<td>62</td>
</tr>
<tr>
<td>3. Primary and Secondary Creativity</td>
<td>66</td>
</tr>
<tr>
<td>4. Levels of Creativity</td>
<td>67</td>
</tr>
<tr>
<td>5. Artists and Scientists</td>
<td>69</td>
</tr>
<tr>
<td>6. Is it Possible to Teach Creativity?</td>
<td>76</td>
</tr>
</tbody>
</table>

## CHAPTER IV

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Architecture in Relationship to the Arts and the Sciences</td>
<td>81</td>
</tr>
<tr>
<td>3. Education in Creativity: A Matter of Reinforcements</td>
<td>90</td>
</tr>
<tr>
<td>4. Education in Architecture Within the Creative Process</td>
<td>92</td>
</tr>
</tbody>
</table>

## CONCLUSION

| Conclusion | 101 |
INTRODUCTION
INTRODUCTION

Believing that the main problem to understanding oneself is in one—in the dislocated idea that one has of oneself, and that does not exactly correspond with what one is—I began to realize that the main obstacle the culture faces in understanding man, is the poverty of the cultural conception of man that does not correspond with what he actually is. Such is the synthesis of the first chapter. A chapter in which I tried to express my discontent related to the Humanities and Philosophies; against the inadequate use of the thinking languages and modes of thought. But overall, my profound resentment to the lack of trustful conceptualizations in the current world, in which the understanding of what creativity is, is expected to emerge from phenomenology; and where implementation and methodology want to be imposed even in the understanding of the Arts. Is it that we cannot trust in our feelings to understand Art?

In the first chapter there is, of course, exaggeration in my words, to which I had to resort in order to stimulate my thinking while making the associations that I used in the second chapter.
The second chapter is less than a hypothesis. It is a play oriented to devise a more complexly articulated concept of man, in which the elements—commonly known either as separate parts or sub-divisions—are here integrated by associative relationships forming an organic scheme. I remembered an enunciation by Karl Popper, in which he stated that it was more important to analyze the product than the production to understand processes. And an analogy came to my mind. The objects of the analogy were man and what man makes. I considered man as the product, and what man makes as the production. So I imagined that if one wanted to understand creativity—the production—it was more important to previously understand man—the product. Since man is in himself a product of what he makes, a product of his creativity.

I had been taught a classification of orders in man, by Dr. Jose Luis Romero Villar, S. J. It consisted of three physical orders: the biological, the physiological, and the anatomical; and also of a social and psychological orders too. Dr. Romero Villar was investigating practical psychology, and I knew that he was informed about some relaxation techniques used in the Sufism.
Investigating about creativity in other cultures, I came in contact with The Teachings of Gurdjieff, who emphasized that the three important aspects in man that needed to be in harmony to develop creativity were the instincts, the emotive and the thinking. What encouraged me to further think about it, was a picture of Mrs. Frank Lloyd Wright, printed in the book, in which she appears among those who had attended Gurdjieff's institute in Paris. I imagined then that these three orders of Gurdjieff and the three orders of Romero Villar could have something in common: the nexus provided by the Sufism, at least as a common experience to both in their investigations.

Initially, I was seduced by this association, but it did not last. However, remembering Romero Villar's and Gurdjieff's three orders, I found that two of the elements could be connected: the biological and the instincts. Immediately I understood that man was not guided any more by his instincts—or by his instincts alone—instead that man was guided by motivations. Julian Jaynes' book made me imagine a primitive man, guided primarily by his instincts. And also made me understand that if his
instincts became motivations, it was because man developed a consciousness based on his senses, and that he had emotions that acted conjunctly too. The lines of the scheme began to appear:

<table>
<thead>
<tr>
<th>BIOLOGICAL</th>
<th>PHYSIOLOGICAL</th>
<th>ANATOMICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTIVATIONS</td>
<td>CONSCIOUSNESS</td>
<td></td>
</tr>
<tr>
<td>INSTINCTS</td>
<td>SENSES</td>
<td>THINKING</td>
</tr>
</tbody>
</table>

By then I was already thinking about the emotions and the sensations that are correlated to the senses and to the physiological order. And I was also thinking about consciousness and sub-consciousness, and about conscious motivations and sub-conscious motivations. But accepting all these elements to include them in the diagram took me some time.

1. BIOLOGICAL   PHYSIOLOGICAL   ANATOMICAL
   | SUB-CON. MOT. | EMOTIONS | SUB-CONSCIOUSNESS |
2. INSTINCTS     SENSES        THINKING
3. MOTIVATIONS   SENSATIONS   CONSCIOUSNESS
At that point I had imagined man in three aspects. The third one seemed to be the one that needed to have attention payed to it. And within it, I identified two independent systems, the emotive—sub-conscious motivations, emotions, sub-consciousness—and the sensitive—motivations, sensations, consciousness. Finally, I imagined that questioning, understanding, intuition, idea, fantasy, and imagination were grounded in both the emotive and the sensitive. I called them the abilities in creating or the creative abilities that I explain in the third chapter.

From this point on, I started to learn from the diagram, which I do not consider to be an explanation of man. But that allowed me to connect some aspects related to creativity, even when many of the associations presented, would demand further research.
1. **APPROACH TO CREATIVITY**

As an architect one is trained in disciplines where one learns more about design methodology than about creativity in itself. More about designing methods than about creative thinking as applied to the sciences, because some kind of analysis and methodology is relevant in the practice of design. Therefore, this practice is, in Architecture, supported by theories, which belong to the world of ideas.

The world of ideas does not have limited boundaries, and it is ultimately problematic, unstable, and challenging. At the same time it is not an avoidable world, one cannot withdraw from it because one has to think, one has to comprehend.

Sometimes it is possible to set references a priori in order to keep the thinking within a certain area, as when studying something very specific related to a well defined field. Creativity is not one of those fields, nor is Architecture.
Inside defined areas the information is more likely to be measurable; as in Biology, when a scientist develops an investigation to test cellular stimuli; or in Computer Sciences, when a technician produces a method to debug a new machine.

Many times, however, setting references a priori, limits the problem area too much, and it is not possible to maintain the analysis within the chosen parameters because the identification of the problem demands more data, and that data exists outside of the givens. Furthermore, solving problems requires different ways of thinking and conceptualizing. When facing a live problem, a problem that has not yet been thoroughly identified, and consequently is still presenting many unknowns, one has to be flexible while thinking. The explanation of creativity is a live problem. So is man. So is architecture. The understanding of the three is necessary in construing the process of creativity in relationship to Architecture.

Despite being so ultimately abstract, and its essential concealment, I am prone to believe that the understanding of such a process can be clarified.
Initially I tried a phenomenological approach, assuming that intuition was the key to identifying the problem. I learned a great deal from the research of definitions and from the vast material available. It was worthwhile. But I realized that my research was not leading me towards understanding its process. Instead, it was only providing me with the information to redefine concepts; and eventually, by doing so, to find other relationships within the subject matter that would only contribute to the same points of view. I do not mean to diminish these, because they are useful. Nor do I deny the validity of phenomenological orientation, which could provide some interesting and original elicitations. But I am not only seeking the discovery of definitions; and although I am not gratuitously after the attainment of originality for its own sake, I am curious about the process of creativity. There is much information available, but there is a lack of insightful material for deciphering the actual process of creativity itself. Perhaps, there is no way to do it.
But, I am aiming at the explanation of such a process. And I will be eclectic towards both the sources and the modes of thinking that I use. Furthermore, I am even planning to imagine about man's nature, because I think that man's creativity is related to it.
2. **RESOURCES FROM THE HUMANITIES**

In the Sciences, as well as in the Humanities, there is interest in understanding what intuition is because its relevant role in any creative process is universally recognized. There is no agreement on the issue of how scientists and artists display creativity in their respective fields. There is interesting material written by critics in both the Sciences and the Arts, reporting opinions concerning what scientists and artists felt when creating, and how they did it. Since there is not only one foundation to base these opinions on, there is still fertile ground for argument. Consequently, opinions become suggestions and inspirations to imagine the emotions that, oscillating between satisfaction and pain, creative people experience when trying to solve a problem.

When beginning a line of research within the Humanities, one immediately clings to available definitions, seeking a safe ground. Simultaneously, one is involuntarily drawn toward pre-established points of view, already
puzzlingly intertwined. The deeper one journeys into the search, the more uncertainties that appear, giving birth to questions that could go on forever. The answers to the questions are nothing more than yet another series of questions.

Most writings in the Humanities are revisions and clarifications that present no hope for a consistent improvement. I feel that there is something inadequate within the field of Humanities, and this feeling is not only my own. No wonder there is currently a strong skepticism towards philosophy. I have heard informal opinions from responsible researchers who believe that today studying philosophy is a waste of time. People in general agree with this opinion. Everything seems to indicate that people's beliefs are returning to a more elaborate, and hence more scientific naturalism, where the biological sciences would be the trustworthy vehicle to look towards for solving the hieroglyphics of human nature.
Perhaps the currently accepted versions of the philosophical or humanistic conceptions of man in the twentieth century, are already exhausted. No further clarifications can be achieved from the simple explanation of the dualism body–mind. One feels the sense of revisiting the same old roads with new shoes, that fitting better, make the walking more comfortable; but the landscape is the same, and within it only the seasons of the year add some variety to the whole. However, at some point one realizes that the new shoes, and the change of season, are not enough to elongate the road of the Humanities, where currently, there is little excitement, and even less hope.
3. OPERATING IN THE WORLD OF IDEAS

When speaking of creativity, one is referring to an existent object in a world of ideas, christened by Karl Popper, the "third world". He demonstrated and explained its autonomy as well as its reliability. Its complexity is verified in its capacity to generate further problems that demand both the discovery and the solution by man. Although initially created by him, the problems of the third world become autonomous. Man's invention escapes his control, and compels him to unfold its concealment, forcing him to face the challenge of his own ideas.

Concepts and theories acquire independent bodies. They become modes of thought and thinking languages that are appropriate to identify and solve different aspects of the Sciences and other disciplines. Conceptualization is always necessary, but often the autonomy of both the modes and the languages of thinking predominate over conceptualization. Quoting words from a lecture by Bruce Johnson, at the University of Illinois, May 6, 1964,
"Nothing is worse than an excessive trust in the mathematical symbols, because students are prone to take the shortest way, considering the formulas, instead of the facts, as the physic's reality."

The ability to conceptualize is essential to determine the thinking language applicable to every problem. Some problems need a verbal thinking, others a graphic analysis, and some a mathematical language.

Bruce Johnston's words are an inspiration to understanding that creativity demands conceptualization. Creation in its primary stage is subtler, simpler, and more poetic than its surrounding context. The emergent idea is a naked entity, that has to be born in the nude, where there could be no confusion about its body.

At one point during the process, the adjustments and corrections added to the emergent idea will make it more operative, and subsequently, more useful.
Implementation provides the necessary elements for ideas to be operative, but one is often deceived by the hope that creativity derives from more complex implementation. Phenomenologic approaches in themselves have more in common with implementation than with the emergence of new ideas. In the verbal language of phenomenology, one feels safe in the safe womb of what is reliable, because one feels backed by a general consensus. But one could also be trapped by banalities, and the new relationships that one could find would more likely be weak.

Realizing the above, awakens profound fears. One is confronted with two options: either following only the certainties of what is known, or running a risk. According to an article by Eliseo Vivas, published in Creativity in the Arts, edited by Vincent Tomas,

"If the scientist must ignore what he cannot observe and measure, let him do so-but why, except as prompted by doctrinaire intransigence, must he deny that which eludes him?"
4. THE IDEA OR MODEL THAT MAN HAS OF HIMSELF

Perhaps it is not by haphazard means that Arithmetic was developed as a decimal system, since ten are the number of fingers that helped develop the intuition of measuring quantities. Man created his own consciousness in correspondence with his environment and himself. Although this hypothesis about the decimal system being derived from the number of fingers could be erroneous, it is at least a provocative coincidence. In Mathematics the control over the quantities became an abstract operation where conceptualization proved difficult to the average student. The intuition of quantities diluted in the combination of the mathematical symbols. The mathematical language became a tool frequently used without a previous conceptualization, because it provides a strong methodology applicable in solving many problems.

This is the easiest example to understand how in the world of ideas, disciplines become autonomous. They
oblige man to find the rules in the thinking languages. Discoveries and inventions become active issues in changing man himself, in modifying his consciousness. But they also keep man within the wide platform of what has been discovered, making him rely too much on his consciousness, on what he has to be taught, impairing in him the spontaneous perception on which creativity is grounded.

The building of a culture is made upon the discovery of concepts and the correction of conceptualizations. Among these corrections the concept of man within the Humanities always needs adjustments. In the Western Culture, the concept that man has of himself is based upon his self observation as an object of study as a part of the environment. As a phenomenon that needs more external description than internal understanding. By these means of observation, however, the Western Culture identified both the correspondence and co-existence in man of a body and a mind, institutionalizing such a dualistic schema.
5. **THE MAIN OBSTACLE TO THE ANALYSIS**

The main epistemological object that the culture faces, is in its own conception of man. The model through which all of his functions are expected to be understood. These functions are inferred as happening somewhere within man, since there are more functions identified, than parts in the model. Then, these must be conceived as floating and flowing within the schema body-mind.

Too many phenomena have been identified and recognized within man in the dualistic body-mind schema, suggesting two situations:

1. That there have been imagined within man a greater number of functions than he actually displays, exceeding the efficiency of the dualistic body-mind conception. In which case the terminology of functions and phenomena should be repetitive.
2. That the dualistic explanation body-mind has to be revised, because the reality of functions and phenomena within man demands a more complex conceptualization.

I believe in the latter, because the idea of man having his instincts, motivations, senses, sensations, emotions, thinking, sub-consciousness and consciousness wandering aimlessly, and obeying laws that do not follow an order, is too chaotic. And until one understands more about how these are organized, one will not be able to improve the explanation of the creative process.
6. ADDITIONAL COMMENTS ON THE HUMANITIES

The struggle in explaining man's functioning among the Sciences and other disciplines is obvious. Lately, Psychiatry has apparently made greater improvements on the issue than Psychology. Currently, understanding cellular chemistry seems to be more promising than psychotherapy. This highly sophisticated Naturalism is seen as the panacea man has been seeking for centuries.

There is no naivete, just confusion; because the Humanities that for centuries pulled the development of the scientific world, indicating what had to be looked at, are suddenly confronting an impassable barrier of conceptualization. It was through the Humanities in Psychology, that man came to the understanding of a great part of his behavior. The consolidation of this discipline provided the platform for the advances of all other Sciences, including Psychiatry. As man's nature is organic, and the correspondence among its different planes is a fact, it is more likely to expect complementation among disciplines that study man's
aspects instead of finding contradictions. It is evident that the distrust there is towards the Humanities is a possible vehicle for propounding—or at least suggesting—new conceptualizations today, when its role is definitely passive and confined only to recording what happens in the environment.

Exaggerating, the Humanities are no longer able to witness the cultural evolution, since the conscious level of understanding that its verbal thinking language provides, does not suffice. The only chance for its survival would be the discovery and the usage of a new mode of thinking, more efficient to its role of integrator among sciences and disciplines. History, Theory, and Criticism in Architecture is also making claim to a more efficient mode of thinking, especially in order to deal with symbolism in Architecture.
CHAPTER II
1. **THE PHYSICAL NATURE OF MAN**

It may seem futile to pay heed to the physical nature of man when trying to analyze what creativity is. But one can better keep track of the phenomena and functions that man displays when supported by a stable reference. Man's body has remained virtually the same in organization and functioning for thousands of years—except for the artificial modifications that surgery allows today. However, the complexity of the functions that man displays has changed very dramatically. To such a great degree are these changes perceivable, that they instigate permanent confusion. Today one is not able to totally understand the thoroughly physical aspects of humankind, and one is even less able to understand the other aspects. **This entire Chapter is not even a hypothesis. It is only a device to further thinking about man, and what man does. It is not an attempt to an explanation of what he is.** (This is, in a way, a game.)

The body of man has a correspondence with his mind, and it is organized in three systems or orders:
1. The first order is the biological, manifested in the cells of the human body, and in the cellular functioning.

2. The second is the physiological, that encompasses the ramifications of the nervous system and the endocrinological glands.

3. The third one is the anatomical configuration, structured for movement and displacement, and organs to allow this among which the brain plays a relevant role.

From now on, the three will be referred to as the biological, the physiological, and the anatomical orders, understanding that this terminology represents more complex systems.

Man's communication with the entire environment is attained through his senses, and this sensorial understanding of the world and the universe is essential to either construing or imagining the development of
the Western Culture. It was by observing man's nature that this division of the three orders was conceived of and identified. One of the supports to explain the existence of at least these three orders is the manifestation of man's sexuality independently within each of them. Psychologists think about a biological, a physiological and an anatomical sexuality as counterparts to a psychological and social sexuality. What is going to be useful in the further analysis will be the conceptualization of these three orders:

BIOLOGICAL       PHYSIOLOGICAL       ANATOMICAL

The fact that the human's body did not evolve as much as his mind is more evident if one accepts the theory of the punctuated equilibrium, or punctuated evolution. Conceived of not as a continuous sequence, but instead as leaps that produced the gaps or the Darwinian missing links. Whatsoever could be the hypothesis one clings to, the human being, as of today, developed his mind, behavior, and consciousness more than the changes that occurred in his body. Since it is presumable that
the human body did not change its organization in thousands of years, the primitive consciousness of primitive man, and the evolved consciousness of the civilized man, inhabited a similar body.

Julian Jaynes explained carefully his theory about the evolution of consciousness in man, hypothesizing its development. Similarly, it is perhaps possible to imagine the development of other aspects in man departing from a hypothetical primal instinctive behavior.

In order to make such a hypothesis, one needs to imagine a departure point in which individuals are an already organized system of body and mind. One also needs to imagine the human body structured according to the three systems previously mentioned:

| BIOLOGICAL | PHYSIOLOGICAL | ANATOMICAL |

In attempting to make associations in a conceptual diagram, one will imagine instincts as a very strong
drive or force, compelling man to act, and one is going
to place them within the schema, below the Biological,
since one will assume that instincts must be grounded in
the cellular behavior.

BIOLOGICAL—-PHYSIOLOGICAL—-ANATOMICAL

INSTINCTS

The connections among the physical orders are expressed
by the dashed line indicated in the graphic. But besides
the instinctive order, there are other phenomena that
emanate from man: the senses and the
thinking. These are going to complete the first part of
the schema:

BIOLOGICAL—-PHYSIOLOGICAL—-ANATOMICAL

INSTINCTS SENSES THINKING
2. FROM INSTINCTS TO MOTIVATIONS

One wonders if there is only one strong instinct within man, that of survival, and if all other instinctive behaviors stem from it. For instance, the instinct of feeding is ultimately connected with living and keeping alive the functions of the body. The reproductive instinct has to do with continuity, related to preserving the species. In an analogous way, the instinct of defense, or self-defense, compels man to fight or to hide. Some authors have written about priorities in instinctive order, as if some of them were preceding others. The conceptualizing of the instinctive behavior in man provides an analogy to the cellular functioning. The automation of certain functions such as breathing, that belongs to the instinctive impulse of feeding the body, must be seen as a part of the instinctive sense of survival.

There are of course priorities, given by the circumstances and the needs. Being in the middle of battle the warrior forgets about hunger, because the danger is not starvation, but war injuries. It is not
the lack of nourishment which threatens him, but the external danger menacing the integrity of his body. Once the battle is finished, the warrior will need to restore energy by feeding himself. If he doesn't, there is a chance that he will very likely not be able to defend himself in the next combat. If there is a lack of food, or if there is no time to rest and eat, he will die from exhaustion.

To feed himself, to continue his vital functions, primitive man needed only raw food. Today, only some goods are consumed raw, man prefers to modify the taste of what he is going to eat because he developed motivations towards some flavors. Throughout his experience, he developed motivations towards things and actions guided by his emotions and his senses.

Today, man needs more than a cave to protect himself. His own instinctive desire for preservation originated within him an activity of "making". Man develops the making to overcome circumstances, and in making, the nexus preservation-making is lost to the extent that there seems to be no linkage between them. In making,
man modifies the environment according to his needs, he solves some problems and also creates conflicts.

Once man started making, he produced differences between types of action and objects. What existed before was changed into something new. The quality and quantity of activities became tasks to be accomplished by the making, as roads departing from the instinct, branching off whenever making was possible and vanishing into the imagination.

"Caminante, no hay camino,
se hace camino al andar."

(Traveler, there is no road,
/one makes the road as one goes.)

Manuel Machado.

Primary instinctive life, if it existed in man, must have been very similar to the biological cycle of the cells:

1. Feeding/Nourishing
2. Storing/Processing Energy - Resting
3. Continuity of life--Reproduction
Man is instinctively led to preservation by performing activities. Man's need to make insures the preservation and continuity of life. In making, however, man finds many choices. Every healthy individual would defend himself from a menacing circumstance that demands protection, but not every individual would build a shelter. Some would defend themselves by running away, some by making tools to attack. Others would hide in the darkness of a cave, and a few perhaps would build walls to set boundaries.

In going, in making, man forgets that everything started by the need of preserving, and he concentrates in the making. The object of the making becomes autonomous, and inter-dependent, of other makings and objects. The energy of the making remains as a constant, as the only instinct that pulls him towards something. The road of making departs from preserving, and as man moves along, he forgets the departure point. Man does not clearly know where he is going, but in moving, he has to keep away from the threat of destruction. Therefore, the
original parameter of preservation is translated into the avoidance of destruction.

But it is not making what enables man's preservation. It is the way man responds to it, constantly modifying, what keeps him alive. And that is creativity.
3. **COMPLETING MAN'S DIAGRAM**

Man communicates with the environment through his senses. Using them, he recognizes, identifies, and realizes what is happening around him. Man discovers the environment by his senses, and he observes himself as a part of it, as a phenomenon within it, looking at himself from outside himself. The culture of the Western Civilization is mainly sensorial.

Senses allow man to feel pleasure and pain, among many other sensations. Man has emotions too, and whereas some of them are deeply felt, such as anger, he has to refer to them as associated to the signs that produce them, to sensations, in a metaphorical way, since he has no other reference. Imagine a primitive man, strongly guided by an instinctive behavior. This should have resembled cellular behavior, organized in three basic functions: feeding, resting or restoring energy, and reproducing. For a long time, these basic functions should have been the issues that insured the preservation of man. However, in his response,
he displayed complexity, he started to identify sensations and emotions. While eating, he was able to "read" or "feel" flavors and tastes that either pleased him or not, enabling him to make decisions in choosing his food, in hunting according to his needs, and in producing according to what he wanted. Complementing his instincts, motivations appeared as the main drive in man. His organic nature implies the existence of motivations, senses, emotions, sensations, sub-consciousness and consciousness.

The first hypothetical association will be that the biological, the physiological and the anatomical orders are an aspect of human nature that corresponds to a second aspect consisting of the instincts, the senses and the thinking. The hypothetical third aspect in human nature would be the phenomena of motivations, sensations, emotions, consciousness and sub-consciousness, fantasizing that they are a result of the interaction between the other two aspects.
Isolating the third aspects in a partial diagram:

<table>
<thead>
<tr>
<th>EMOTIONS</th>
<th>SUB-CONSCIOUSNESS</th>
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<tbody>
<tr>
<td>MOTIVATIONS</td>
<td>SENSATIONS</td>
</tr>
<tr>
<td></td>
<td>CONSCIOUSNESS</td>
</tr>
</tbody>
</table>

One will pay attention to the following possible relationships:
1. Consciousness follows sensations.
2. Sub-consciousness follows emotions.
3. There is a permanent interaction between consciousness and sub-consciousness.

4. There is a sequence of motivations--emotions--sub-consciousness.

5. There is a sequence of motivations--sensations--consciousness.

6. There have to be then two types of motivations; the ones related to consciousness and the ones related to sub-consciousness.

The third aspect then, will be represented as:

```
SUB-CONSCIOUS MOTIVATIONS  EMOTIONS  SUB-CONSCIOUSNESS
-----------------------------------------------
CONSCIOUS MOTIVATIONS  SENSATIONS  CONSCIOUSNESS
```

The role of the third aspect would be the clue to understanding something more about creativity, since man's behavior would come from an interaction and combination of its phenomena. But the most interesting point within it, would be the existence of two independent systems, the emotive and the sensitive.
1. The emotive system: sub-conscious motivations --emotions--sub-consciousness.

2. The sensorial system: conscious motivations --sensations--consciousness.

The next stage of the diagram then would be:

<table>
<thead>
<tr>
<th>1st. Order</th>
<th>2nd. Order</th>
<th>3rd. Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st. Aspect</td>
<td>BIOLOGICAL---PHYSIOLOGICAL----ANATOMICAL</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>SUB-CONS.MOTIV.</th>
<th>EMOTIONS</th>
<th>SUB-CONSCIOUSNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd. Aspect</td>
<td>-----------</td>
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</tr>
<tr>
<td>CONSCIOUS MOTIV.</td>
<td>SENSATIONS</td>
<td>CONSCIOUSNESS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2nd. Aspect</th>
<th>INSTINCTS</th>
<th>SENSES</th>
<th>THINKING</th>
</tr>
</thead>
<tbody>
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<td>communication with the environment</td>
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</table>
It is important to review how consciousness and sub-consciousness operate. It is easier to learn about the operations of consciousness, than about the functioning of the sub-consciousness, since the features of the consciousness can be described, whereas understanding the features of the sub-consciousness demands a previous experiencing of them.

The functioning of consciousness is owing, according to Julian Jaynes, to six features. They are: spatialization, excerption, the analog "I", the metaphor "Me", narratization and conciliation. I am reproducing below parts of Julian Jayne's explanations about these features,

The Features of Consciousness

1. Spatialization.....If I asked you to think of your head, then your feet, then the breakfast you had this morning, and then the Tower of London, and then the constellation of Orion, these things have the quality of being spatially separated; and it is the quality I am here referring to. When we introspect
(a metaphor of seeing into something), it is upon this metaphorical mind-space which we are constantly renewing and 'enlarging' with each new thing or relation consciousized.

.....

We rather assume these 'spaces' without question. They are a part of what it is to be conscious and what it is to assume consciousness in others.

2. Excerpt. In consciousness, we are never 'seeing' anything in its entirety. This is because such 'seeing' is an analog of actual behavior; and in actual behavior we can only see or pay attention to a part of a thing at any one moment. And so in consciousness. We excerpt from the collection of possible attentions to a thing which comprises our knowledge of it. And this is all that it is possible to do since consciousness is a metaphor of our actual behavior.

Thus, if I ask you to think of circus, for example, you will first have a fleeting moment of slight fuzziness, followed perhaps by a picturing of trapeze artists or possibly a clown in the center ring. Or, if you think of the city which you are now in, you will excerpt some feature, such as particular building or tower or crossroads. Or if I ask you to think of yourself, you will make some kinds of excerpts from your recent past, believing you are then thinking of yourself.

3. The Analog 'I'. A most important 'feature' of this metaphor 'world' is the metaphor we have of ourselves, the analog 'I', which can 'move about' vicarially in our 'imagination', 'doing' things that we are not actually doing...
4. The Metaphor 'Me'. The analog 'I' is, however, not simply that. It is also a metaphor 'me'. As we imagine ourselves strolling down the longer path we indeed catch 'glimpses' of 'ourselves',...

5. Narratization. In consciousness, we are always seeing our vicarial selves as the main figures in the stories of our lives. In the above illustration, the narratization is obvious, namely, walking along a wooded path. But it is not so obvious that we are constantly doing this whenever we are being conscious, and this I call narratization....

But it is not just our own analog 'I' that we are narratizing; it is everything else in consciousness. A stray fact is narratized to fit with some other stray fact. A child cries in the street and we narratize the event into a mental picture of a lost child and a parent searching for it. A cat is up in a tree and we narratize the event into a picture of a dog chasing it there. Or the facts of mind as we can understand them into a theory of consciousness.

6. Conciliation...We assimilate a new stimulus into our conception or schema about it, even though it is slightly different. Since we never from moment to moment see or hear or touch things in exactly the same way, this process of assimilation into previous experience is going on all the time as we perceive our world. We are putting things together into recognizable objects on the basis of the previously learned schemes we have of them.

...If I ask you to think of a mountain meadow and a tower at the same time, you automatically conciliate them by having the
tower rising from the meadow. But if I ask you to think of the mountain meadow and an ocean at the same time, conciliation tends not to occur and you are likely to think of one and then the other. You can only bring them together by a narratization. Thus there are principles of compatibility that govern this process, and such principles are learned and are based on the structure of the world.

Sub-consciousness, on the other hand, does not narratize. It presents and exposes, symbolically, sequences that have a meaning coded according to the emotions. Neither the motivations that pull the sub-consciousness—subconscious motivations—nor its symbolic images are ipso facto clear. Emotions are an alteration of an order perceived by man. This variance that is sometimes very accentuated, as in extreme anger, can also be very subtle or even completely repressed. Emotions are present in the symbolism of the sub-consciousness, and they can be, as the symbolic images themselves, either very subtle and blurred, or completely repressed.

The role of the emotions in man is relevant to such a degree that they were probably the first manifestation
of expression using the language. When the primitive man needed to communicate fear before the threat of animals' or other tribes' attack, he felt his emotions. The hypothesis is that the language appeared in a sequence starting from adjectives to express emotions and sensations, then the nouns to refer to objects and finally the verbs to allow narratization of action. The best way to describe an emotion to someone is to make him feel it, instead of describing it to him.

The meaning of the associations in the subconsciousness, is brought to the consciousness by feeling them. Once the feeling implicit in the symbolism is identified, the information becomes conscious and useful to the individual.

5. LEFT-HANDED AND RIGHT-HANDED THINKING

Reproduced from James L. Adams' Conceptual Blockbusting

"In reading the literature associated with conceptualization, one often encounters reference to "left- and right-handed
thinking." This is discussed particularly well by Jerome Bruner in his book, On Knowing: Essays for the Left Hand. The right hand has traditionally been linked with law, order, reason, logic, and mathematics--the left with beauty, sensitivity, playfulness, feeling, openness, subjectivity, and imagery. The right hand has been symbolic of tools, disciplines, and achievement--the left with imagination, intuition, and subconscious thinking. In Bruner's words:

...the one the doer, the other the dreamer. The right is order and lawfulness, le droit. Its beauties are those of geometry and taut implication. Reaching for knowledge with the right hand is science...Of the left hand we say that it is awkward...The French speak of the illegitimate descendant as being 'a main gauche', and though the heart is virtually at the center of the thoracic cavity, we listen for it on the left. Sentiment, intuition, bastardy. And should we say that reaching for knowledge with the left hand is art?

Oddly enough, this historical symbolic alignment of the two hands with two distinct types of thinking is consistent with present understanding of brain function. The left hemisphere of the brain (which controls the right hand) contains the area which are associated with controls of speech and hearing and involved with analytical tasks such as solving an algebra problem. The right hemisphere (which controls the left hand)
governs spatial perception, synthesis of ideas, and aesthetic appreciation of art or music. However, this coincidence is not the main message here, which is that the effective conceptualizer must be able to utilize both right-handed and left-handed thinking. C.P. Snow, in his famous book hypothesizing the existence of two cultures, *Two Cultures and the Scientific Revolution*, separates scientists from humanists. Yet, if one can separate people that clearly, then the people one has separated are not maximizing their creative potential. The scientists who are responsible for breakthroughs in knowledge cannot operate entirely by extrapolating past work, but must utilize intuition, too. Similarly, the humanists who disregard the logical are doomed to be ineffectual (even counterproductive) in influencing social actions.

An emphasis on either type of thinking—to the disregard of the other—is a cultural block. In the professional world in our culture, the emphasis is placed on right-handed thinking. It is easier to get money to support right-handed thinking than left-handed thinking. More fathers want their sons to be lawyers, doctors, or scientists than painters, poets, or musicians. Until the culture is willing to accept the equal importance of left- and right-handed thinking in both sexes, a large number of its members will continue to suffer from this conceptual block.
6. THE FUNCTIONS OF THE EMOTIVE AND THE SENSORIAL SYSTEMS

Both the emotive and sensorial systems would act very subtly, and efficiently complimenting each other. The sensorial or sensitive system would always deal with measurable information, it would quantify. The sensible or emotive apparatus would perceive order, it would qualify.

They would act coordinately, and in any activity man displays, they would always be present. Even in mathematics. Without the existence of the sensorial system, it would not have been possible to start counting. Whereas, without the existence of the emotive system, the intuition of an order around which to build an arithmetical system, should not have been possible either. Realizing the contributions of the two in Mathematics, would provide the vision of the aesthetics that mathematicians pursue, a highly abstract pleasure uncommonly experienced. In the educational process one is already taught a mathematical order discovered or invented thousands of years ago, and already consolidated and enriched by the additions of
many mathematicians. A methodology is transmitted to think and calculate mathematically, without one having to discover that order. However, the learner's understanding of mathematics demands the development of a special type of sensibility in order to perceive the mathematical facts beyond its formulas. Only by feeling the mathematical order can one imagine the beauty mathematicians perceive in discovering or founding new orders.

In the Arts, on the other hand, the artists search for new orders to be expressed through their media. In their work they express—either by re-affirming or by denying—the orders they follow. Although the manifestation of the emotive system in the comprehension of orders would be essential to the arts, no less important would be the sensorial system by which the artist would transform the material he will use to display his artistry. Currently, within education, there is no available methodology to provoke in art students the growth of their sensibility. This is a chance they will take, and they will have to learn
intuitively from other artists' experience. The education in the arts, however, provides the students with technical information, and by understanding it, they are likely to reach the perception of the emotive aspects. When art teachers describe sensible aspects, they mainly impart technical information that would hopefully have an incidence in the development of the student's sensibility. The sensible aspects cannot be taught by description; they have to be felt, and there is no way to teach how to feel only by means of words.

It is important to realize that an attempt to make art only by means of the emotions would lead to over sentimentalism. Whereas the denial of the emotions would impair the perception of new orders essential to the arts, in which case the artistic attempt would be nearer to the technical aspects of craftsmanship than to the arts themselves.

Continuing the hypothetical assumptions, the interaction of both the emotive and the sensorial system would give a result. This would be the manifestation of the following abilities:
1. Questioning
2. Understanding
3. Intuition
4. Idea
5. Fantasy
6. Imagination

These abilities that would flow from the inner part of man, from an interaction of a sensitive and an emotive system, would allow creativity to happen. Therefore, one should call them the creative abilities.
CHAPTER III
1. CREATIVE ABILITIES

Before talking about creativity in itself, it would be necessary to briefly explain some personal ideas about questioning, understanding, intuition, idea, fantasy, and imagination. I conceive of them as being the elements in the creative process. I also think they are a result of the two hypothetical systems—the emotive and the sensitive. Then, the mentioned abilities would be related to motivations, emotions, sensations, sub-consciousness and consciousness. Imagine that the two systems co-exist in man in permanent activity. From such unstability—that is more a virtue than an imperfection—would arise the creative abilities we are going to talk about.

Questioning

Questioning would be the ability oriented towards coming out of the chaos. Man questions himself when acquiring consciousness of confusion, or simply when not reaching clarity. Questioning is a search for
order. A need of order grounded in the emotive system.

Understanding
Understanding would be the truce in the middle of the instability, a truce in which an explanation could be consciously assimilated. However, such assimilation would be achieved only when the emotive system would approve the new order. If this approval would not happen, there would be no understanding. Understanding is not merely a rational thinking process, it also involves an emotional aspect.

Intuition
Intuition would be the sudden, and I would say spontaneous, perception of an order by association of data that one already possesses. Intuition does not explain, instead it presents uncommon associations between facts hidden to the consciousness until the intuitive process links them. Even though intuition is produced by the
emotive system related to the left handed thinking— it utilizes data arisen from the sensitive system, the right handed thinking. If the data associated are not accurate, the result is not useful. From an article by Michael McCloskey, "Intuitive Physics" published in Scientific American, April '83, p. 123:

Why do people so often misjudge the path of a moving object when they solve problems or carry out actions? Several recent studies, including the ones I have described, indicate that the errors are not random but systematic. They arise from a general coherent theory of motion that adequately guides action in many circumstances but is nonetheless at variance with the principle of Newtonian mechanics. It is therefore the misconceptions embodied in an intuitive physical theory that occasionally give rise to errors in judgement about motion.

Idea

Idea would be the conscious representation of an intuition. This would mean the conversion of something found by means of the emotive, into a logical form of the sensitive. In other words, ideas would be the result of the communication from the emotive to the sensitive. Ideas are already conscious propositions.
Fantasy

The emotive system of man does not narratize, it associates symbols, signs, groups. The association is grounded in the emotive, as the linkage between symbols. Symbols have two aspects, the meaning and the form, that are respectively interpreted by the emotive and the sensitive. Fantasies are the result of associations that do not owe to a conscious logic. Man has fantasies spontaneously. He associates facts. However, the capacity for fantasizing is diminished in adults—as some other abilities are diminished in them to—by an excessive concentration in the logic of the consciousness. But man can keep his capacity to fantasize, combining data that are provided by both the emotive and the sensitive. Fantasties are a great source of richness.

Imagination

Using the features of consciousness as explained by Julian Jaynes, man imagines. He concentrates and moves his attention in the midst of a mental space in
which he himself is metaphorically placed. Even though imagination belongs to the logic of the consciousness, it would be controlled by the sense of order that the emotive would provide.

Hypothetically assuming that these abilities are products of the interaction of the emotive and the sensitive, the way to stimulate them would be the cultivation of the two. By doing it, by educating both aspects, the reliability on the abilities that flow from them would be enhanced.
2. CREATIVITY

Creativity is a way by which man answers to the making; in an integration of intuition, idea, fantasy, and imagination, to which are also related questioning and understanding. In every creation there would be the contributions of both the emotive and the sensitive. The creative abilities would flow from their interaction. The creation would be a result that is brought into conformity outside the mental space of man; it would transcend his individuality acquiring independence. Creations become independent, but some also become transcendent owing to the creative level at which they manifest.

I searched for many explanations and definitions about creativity to include in this section. None of them allowed me to continue with the previous assumptions. In the search, I applied to other cultures concepts too. Gunter Nitschke, professor of East Asian architecture, showed me a chapter of Unio Mystica, Volume I, Talks by Bhagwan Shree Rajneesh, which I read with interest and
curiosity, but also with a cultural prejudice. However, this text explained exactly what I needed to read in order to understand a little bit more about creativity. p. 178-180.

"Jeva Mohan, action is not creativity, inaction also is not creativity. Creativity is a very paradoxical state of consciousness and being: it is action through inaction, it is what Lao Tzu calls wei-wu-wei. It is allowing something to happen through you. It is not a doing, it is an allowing. It is becoming a passage so the whole can flow through you. It is becoming a hollow bamboo, just a hollow bamboo.

And then immediately something starts happening..."

The author used illuminations from the Western Culture.

When the great poet Coleridge died he left thousands of poems incomplete. Many times in his life he was asked "Why don't you complete these poems"—because a few poems were missing only one line or two lines. "Why don't you complete them?"

And he would say "I cannot. I have tried, but when I complete them something goes amiss, something goes wrong. My line never falls in tune with that which has come through me. It remains a stumbling block, it becomes a rock, it hinders the flow. So I have to wait. Whosoever has been flowing through me, whenever he again starts flowing and completes the poem it will be completed, not before it."
Simone de Beauvoir has said "Life is occupied both in perpetuating itself and in surpassing itself; if all it does is maintain itself, then living is only not dying."

And the man who is not creative is only not dying, that's all. His life has no depth. His life is not yet life but just a surface; the book of life has not yet started. He is born, true, but he is not alive.

... ... ...

In creativity is the surpassing. Otherwise, at the most we can go on perpetuating ourselves. You create a child--it is not creativity. You will die and the child will be here to perpetuate life. But to perpetuate is not enough unless you start surpassing yourself. And surpassing happens only when something of the beyond comes in contact with you.

That is the point of transcendence--surpassing. And in surpassing, the miracle happens: you are not, and yet for the first time you are.

The text of Bhagwan is also religious, and mystic. His is religiousness and mysticism are oriented towards the self-knowledge and the harmony with nature, the being aware.
The concept of creativity as something that one has to let happen through oneself, instead of making it, seems to have a great deal of accuracy. By letting it happen, the creative act would become an integrative process produced by the persons. In a broad sense, their questioning, understanding, intuition, ideas, fantasy, and imagination would contribute towards an approach that does not have to be necessarily in the Arts or in the Sciences. Creativity could be oriented to any activity of man, to his living, to his becoming. The abilities necessary in creating would vary according to the to be created object. Not all the processes in creating would have to demand the same intervention of the creative abilities, but all of these would have to be present, to some extent, in the creative act.
3. PRIMARY AND SECONDARY CREATIVITY

To understand the concepts of primary and secondary creativity, one could imagine the work of a creative artist that initiates a new trend, and the work of another artist that, although being innovative in his paintings, would follow such a trend. The first one would be demonstrating primary creativity through his proposal, whereas the second one would be displaying secondary creativity.

A similar process would happen in the sciences, where some scientists would discover new elements and others would develop some progress upon the discoveries. According to James L. Adams' suggestions, the primary creativity would be attained by left handed thinking, while the secondary creativity would rely on established understanding--right handed thinking. Dr. Irving Taylor, who also investigated creative processes, prefers to think that instead of types of creativity, there would be levels of creativity.
4. LEVELS OF CREATIVITY

Dr. Taylor, in his article "The Nature of the Creative Process," presented at the Visual Communication Conference, 3D, 1958, expressed that there are levels of creativity involving different psychological experiences. That creativity varies in depth and in scope rather than type. That it is misleading to distinguish between scientific and artistic creativity, since creativity involves an approach to problems more basic than the accidents of professional training. He assumes that there exist five levels of creativity.

1. Expressive creativity: This level would be manifested by children's drawings that are only representations of what they see or imagine, and where there are no drawing skills involved. The originality and quality of this product would not be important.

2. Productive creativity: Skills would be more developed at this stage, although products could not be distinguished from others at the
same level, since there would be no stylistic considerations.

3. **Inventive creativity:** It would operate by means of ingenuity, and at this level the creative person would be able to find new and uncommon associations to incorporate in his work.

4. **Innovative creativity:** This level would presuppose a profound understanding of theories and works of the scientists or artists whose trends the innovative creator follows. However, he wouldn't be the inventor, but follower of such trends.

5. **Emergentive creativity:** "In rare circumstances, an entirely new principle or assumption, around which new schools flourish, emerges at a most fundamental and abstract level." (Dr. Irving Taylor) Such creators would be reaching the highest level of creativity.
5. **ARTISTS AND SCIENTISTS**

Most people believe that creativity in the arts, and creativity in the sciences obey completely different laws. That while creating, both artists and scientists are commanded or inspired by a different type of energy. They believe that creativity in the arts, for instance, should demand "freedom", and "looseness", while creativity in the sciences should blossom under the constrains of "rigidity" and "painful search".

I am, however, convinced that creativity in any field, obeys the same laws, but demands the displayment of different skills according to the object being created. It is not the actual process which differs between creativity in the arts and in the sciences, but the purpose or intention, and the tools and skills necessary to create.

Furthermore, the process, I believe, is the same in every individual in any culture. What varies, besides the object of creativity, is the environment in which
the creative person grows and which plays a determinant influence on his personality. Consciousness and subconsciousness are a result of environmental perceptions. Owing to this fact, one cannot expect that an Eskimo without any contact with another culture, will have the same consciousness as a man raised in a well defined four seasonal environment.

Although myths and conjectures concerning the artist's and scientist's mind and work do not lead to identifying the issue, they offer an explanation to the aspects of the arts and sciences. But sometimes, instead of uniting concepts, they divide viewpoints. Supposedly the artistic mind is highly intuitive. The artist himself being "emotional", "sensible" and "whimsical". The artist would be dominated by contradictory passions: whim and constancy, anxiety and contempt, fear and valentyness.

According to Wassily Kandinsky the "principle of inner necessity" is the impulse that brings the artist forward. According to José Ortega y Gasset, the Art
is to the artist a beast in a cage, and the artist's role is to free it. "For he has an internal desire of expression" (Kandinsky).

"...the productive force is in the artist's unconscious mind...The artist's work is controlled by forces that though part of himself and his mind, are not voluntary and not conscious, but work in some cellar unseen and unbidden." (R. G. Colingwood).

The artist needs "integrity of purpose. Ability to maintain the purpose although being clumsy and slow" (Spender). Everything in creating is work, except for the inspiration. Therefore, the artist needs memory to remember and faith to pursue. "Creation is a patient work." (Corbusier). An enormous amount of work where "nothing is absolute. Form composition is relative, depending on the alterations in each individual down to the very smallest" (Kandinsky)
The apparently whimsical aspect of art is owing to a search. The artist is not a slave of his whims, instead he is a part of the rules that he himself devised. An artist explores media either trying to reach a target he already knows--academic artist--or trying to discover something new--creative artist-- aiming at something without knowing what the target will be. This conceptualization of academic artist and creative artist corresponds to the denomination of primary and secondary creativity. The primary being essentially creative and the secondary oriented towards modifying or reproducing aspects of the inventions and discoveries. There is always a risk in the uncertainty of the results. The academic artist and the secondary creative scientist rely on their skills. The creative artist, and the primary creative scientist, do not know whether they will obtain an effective work or not.

"We congratulate an artist not because he obeyed rules that existed before, but because he embodied in color or in language something that did not exist before, and because he was the originator of the rules he implicitly followed while painting or writing."
Afterwords, others may explicitly follow the same rules and achieve a similar success... The academic painter or writer is someone who knows his target and hits the bull's eye obeying known rules... The creative artist does not know initially what his target is. He aims at something." (Vincent Tomas).

Both the academic and the creative follow rules, either seeking for something new by known rules, or pursuing something new by means of unknown rules. "The creative activity is controlled by the fact that the artist already envisages an end. The artist's choices are controlled by making the critical judgements" (Vincent Tomas). "An artist has problems to solve" (Eliseo Vivas). "The to be created object does not push his mind, instead it pulls the mind... But how does the artist know what's right and wrong? Because he feel kicked" (Vincent Tomas).

Note: The quotations of Kandinsky, Spender, Colingwood, Eliseo Vivas and Vincent Tomas, are from their articles published in Creativity in the Arts, edited by Vincent Tomas.
Scientists feel kicked too. They also have to make critical judgements, since they don't envisage an end, although they look for it. Scientists believe in their intuitions to make judgements.

From Henry Poincare's article, "Mathematic Creation"

"The sterile combinations not even present to the mind of the inventor. Never in the field of his consciousness do combinations appear that are not really useful, except some that he rejects but which have to some extent the characteristics of useful combinations."

From Albert Einstein's letter to Jacques Hadamard

"The words of the language as they are written or spoken do not seem to play any role in my mechanism of thought. The physical entities which seem to serve as elements in my thoughts are certain signs and more or less clear images which can be 'voluntarily' reproduced and combined."

There is of course, a certain connection between those elements and relevant logical concepts. It is also clear that the desire to arrive finally at logically connected concepts is the emotional basis of this rather vague play with the above mentioned elements. But taken from a psychological viewpoint, this combinatory play seems to be the essential feature in productive thought—before there is any connection with logical construction in words or other kind of signs which can be communicated to others."
"The above mentioned elements are, in my case, of visual and some muscular type. Conventional words or other signs have to be sought for laboriously only in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will."

Note: The articles by Poincare and Einstein are published in The Creative Process by Brewster Ghiselin.
6. **IS IT POSSIBLE TO TEACH CREATIVITY?**

James L. Adams is among the authors who think that creativity can be taught, and he practices this belief. In his book *Conceptual Blockbusting* he orderly expounds ways to do it. He believes that there is capacity to be creative in every individual, but it is more or less blocked. His methods to teach creativity are based upon knocking down the obstacles that impair it. He analyzes the barriers which he conceived as perceptual blocks, cultural and environmental blocks, emotional blocks, and finally, intellectual and expressive blocks. He believes that in making people conscious about the obstacles and the way to solve them, people would feel more free to think, act, and express themselves, becoming consequently less afraid, more secure and more creative. They would develop confidence in themselves and in what they think, as well as also would learn to see the rest of the people as persons who also have to throw down many barriers. The consciousness that one's problems are similar to
other people's problems would relieve many tensions. The awareness of these problems is the first step toward solving them by conscious means. But there are also assumptions that conscious blockbusting is not the only way to help creativity flow. James L. Adams believes, as well as Robert Ornstein, that some techniques used by the esoteric religious and philosophies, by means of relaxation and meditation, can also help to enhance the creative capacity. But these exercises would demand a lot of time, and definitely a good instructor.

It is curious as well that Bhagwan Shree Rajneesh knows about psychoanalysis, and he mentions it in the chapter he wrote about creativity, in *Unio Mystica*, Volume I, p. 181-183.

Once you don't feel responsible you become natural. And psychotherapy has been of great help; it relaxes you. All that you have repressed surfaces, and after surfacing it evaporates. After going through psychoanalysis
you become less burdened, you become more natural, you are more in harmony with nature and with yourself. That is the meaning of being healthy.

But this is going back, this is regression. This is what I was talking about the other day: going to the basement. There is another way to surpass, and that is going to the attic—not the way of Sigmund Freud but the way of Buddha. You can surpass yourself by being in contact consciously with nature. And that is the essence of wisdom—to be in harmony with nature, with the natural rhythm of the universe. And whenever you are in harmony with the natural rhythm of the universe you are a poet, you are a painter, you are a musician, you are a dancer.

......

When there are blocks of conflicts within the emotive and the sensitive—not only the disbalance creative people experiment under the predominance of some of their abilities—the action necessary to create does not flow. The creative potential that Adams believes would exist in every person would be trapped within the conflictive aspects.

Adam's analysis is thorough in his proposal for blockbusting. And he even considers that the emotional aspects would need to be solved in order to help the creative action flow. Rajneesh's opinion is oriented towards the other aspects, the emotive. But he does not consider that this aspect needs help only
when being in conflict. Instead he thinks that this is an aspect that always needs cultivation by methods different than those oriented towards the conscious. And that such cultivation derives in the development of other skills in man, necessary to be creative.

Listening to both points of view, they would be directed to the needs of educating the two hypothetical systems in man: the sensitive and the emotive. Neither Adams nor Ornstein excluded the possibility of applying exercises provided by the esoteric philosophies, nor Rajneesh ignored the existence of conscious methods to help the emotive, such as the psychoanalysis.

The conclusion would be the creative abilities would benefit from a better functioning of both aspects. And that the educating in creativity should aim to reinforcing them.
CHAPTER IV
1. ARCHITECTURE IN RELATIONSHIP TO ARTS AND SCIENCES

Architecture, in its visual communication is applicable to the field of the Arts, since it plays a direct sensorial dialogue with man and the rest of the environment. But there are, between Architecture and the Arts accentuated differences in scale and costs. It is easier and less expensive to move pictures and sculptures, even storing them in deposits than moving buildings or simply just destroying them. The scale in Architecture has an affect upon the building environment, in which man himself lives. People are not confronted with the arts in the same way. Architecture while lodging man's activities also imposes upon him. Then, even though the experimentation in the Arts is a must, where even irritant proposals are necessary, the practice of Architectural design demands a different responsibility. The experimentation as applied to the Arts is not applicable to Architecture.
I decline opinions that suggested that the Arts should come back to the decorative, and furthermore remain enclosed within it as the only way to feed the Architectural Design with its contributions. I think this is a very limited vision of both the Arts and the Architecture. I conceive the Arts as a permanent field of multiple sensitive testing that is not detached from the emotive order. I do not think that every artistical test or experimentation would be a masterpiece. But it is in the field of the Arts where the confrontations between the sensitive and the emotional take place in a safe convenient territory that does not impose on the environment and on man as much as architecture. And the language and vocabulary of this can be nourished and expanded by the experience of the Arts. I do agree that decorative Arts should not disappear, and that the incorporation of contemporary decorativity in the field of Architecture is necessary. For decades criticism in Architecture rejected decorative and stylist matters, not because they had disappeared, but because they were intellectually denied. But
this denial was not gratuitous. Innovative
creativity in the field of Architecture in response
to the artistic trends originated the avant garde
movements which somehow translated the meaning of the
word eclecticism from its original "best selection"
into "imitation". But in the long run, I don't know
if the satisfaction of an inner sense of order
demanded from Architecture implies the restoration of
a symbolic continuity, or of a connotative one, as
lately reflected in the last trends.

The practice of design and of building is supported
by disciplines that are not as difficult to deal
with, as it is to deal with symbolisms grounded in
the subjectivity of the Arts. They belong to the
different type of thinking, in which the
consciousness of the sensitivity primes. This
supportive platform is fed from the Social Sciences,
the Humanities, and the technological knowledge. An
intellectual opening to all of them is utterly
important in the practice of Architecture.
Finally, creativity in Architecture is applicable to the approaches of creativity in both, the Arts and the Sciences. In its visible environmental communication it is oriented after the creative displayment of the Arts. And in the exercise and practice of the supportive disciplines, architects must apply to the creative thinking of the Sciences.
2. CIVILIZATION: A MATTER OF REINFORCEMENTS

A cultural process would be based upon discovering concepts, adjusting conceptualizations, creating modes of thought and institutionalizing thinking languages. Even though cultural achievements would be autonomous, the cultural process would need the support of a civilization. And civilizations would depend upon cultural achievements, in the task of modifying the environment—physical and social. Man is attaining cultural achievements through a cultural process that can be followed in the steps that civilization takes. It is a path of reinforcements that man makes along his way.
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1st Aspect
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SUB-CONS. MOTIV.  EMOTIONS  SUB-CONS.
Emotive Syst.

3rd Aspect
---

question-understand-intuition-idea-fantasy-imagin
Abilities

2nd Aspect
---

CONSCIOUS MOTIV.  SENSATIONS  CONSCIOUSNESS
Sensitive Syst.

INSTINCTS  SENSES  THINKING

communication
with the
environment
1. The reinforcement of the thinking

Man thinks automatically, no one needs an explanation on how to display his abilities to start thinking. But one does not think well spontaneously. Thinking well demands a training in thinking languages that are mainly verbal, visual, logical, mathematical. Thinking properly demands the knowledge of both the thinking languages and the modes of thinking. Thinking properly is an integration of both. For aiding better thinking, man reverted to writing to help his memory. And he perfected this thinking activity so much, that it allowed him to operate upon other aspects and abilities, and currently he is thinking with the aid of the artificial intelligence of computers.

2. The reinforcement of the senses

Many phenomena are hidden to man's senses because its power are limited. Fortunately, man found the way to augment his sensorial perceptions, to penetrate into a world of phenomena which his natural physical abilities did not allow him to see. Optical
instruments allowed him to observe distances and scales that the human sight cannot reach. Man can apply today to artificial energy, electrical or nuclear, and to processing natural energy by means of high tech. He listens to unimaginable distant signals that only his technical apparatus can receive. He can speak, communicate verbally or through other codes, emitting his signals. He smells chemically through the analysis of substances, and by these same chemical means, he can taste without putting his organism under any risk.

3. The reinforcement of the instincts

The need of preserving himself as a species is man's instinct. He will need to reinforce it with conscious attitudes when preservation is in danger. This consciousness is appearing in the most developed countries.
4. The reinforcement of the physical nature

Without the reinforcement of the physical nature, neither culture nor civilization would have reached the stage which they have. Advances are supported, and complemented, by each other. As man reinforces according to his consciousness, progresses upon the understanding of man's physical functioning related to the health of his body are not possible without the aid of technology. Man started developing the understanding of his anatomical configuration, and progressively the advances of the medical sciences led him to develop the understanding of the neurophysiological and biological orders too, which he has been progressively reinforcing.

5. Synthesis of the cycle

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3. **EDUCATION IN CREATIVITY**

Within our culture, the educational process is carried out by the conscious development of the sensitive aspect, through methods oriented towards a better sense of perception and a clearer way of thinking. Notwithstanding, as man's nature is organic, the development of the sensitive consciousness operates upon the development of the sensible aspect governed by the emotions. I am not sure if this educational system founded in the sensitive will be useful forever, since one has the analogy of the process that civilization and culture follow. The cycle in civilization and in the development of the cultural process, demands the reinforcement of all parts in two aspects of man, as presented in the previous section. By this analogy I am inclined to believe that at some point the education will have to be efficiently directed towards both the sensitive and the emotive. Not as it is now, that the emotive aspect is reached by rebound. Using the analogy of Bhagwan Shree
Rajneesh, man will have to accomplish his basement with building the attic. That means that the emotive aspect will have to be dealt with independently in the educational process, as the other part that every man should be aware of. The sensitive aspect being the basement and the emotive aspect, the attic. The six abilities in creating—questioning, understanding, intuition, idea, fantasy, and imagination—would exist only because man has both a sensitive and an emotive system from whose interaction these abilities are born.

The role of the education would be then to act upon the third aspect in man. To cultivate the emotive and the sensitive, in order to enhance creativity, complementing the reinforcement of the other aspects taken care by the civilization. In developing the emotive and the sensitive, the education would adapt itself to the process by which creativity is attained.
4. **EDUCATION IN ARCHITECTURE**

1. At the beginning of his lecture at Harvard Graduate School of Design, on April 27, 1983, the Spanish architect Ricardo Bofil mentioned the necessity that he as an architect had felt at some time in his life, of building himself, or inside himself, before building outside. This statement implies the necessity of self-knowing to enhance the creative potential. But of course this building of oneself through the self-knowledge cannot be provided—at least by now—at any educative level. It is a personal task that must be accomplished, more or less painfully, in relationship to the individual's possibilities, abilities and opportunities. This is an important point to remember.

2. There is definitely a part of Architecture that cannot be taught verbally. The aspect that concerns so much at the moment, symbolism. The aspect that besides being seen and perceived formally, through
the sensitivity, also has to do with the emotive aspect. There is no way to teach it other than making it be felt by the learner. The problem is then How. And another problem is to find the reference to relate what one feels. The qualitative reference to decide or to understand what is genuine and what is not, as applied to the Arts. But the sensible aspects grounded in the emotive are not a reliable support in education, since one still knows little about emotions. Emotions are not a part of the signs or symbols. They are the way man reacts to them. Any unknown or unfamiliar sign will be rejected by the emotive aspect, unless a nexus that can join the gap between the family of signs that a person knows, and the new signs that appears, could fill such a gap.

I do not see how this part of the architecture can be described. The attempt of semiotics as applied to Architecture was oriented to finding a vocabulary, or to understanding it, in order to look for a further application. But symbols do not speak verbal
languages. They are external to man, and they affect or impress upon both the sensitive and the emotive system simultaneously. The logic in planning, based on the sensitive aspect, does not imply the quality of order required in the emotive aspect. This is known by Billy Baldwin, an American decorator, as expressed in an interview by George O'Brien. *The New York Times Magazine*, part 2, April 17, 1983.

"Early on my association with Ruby Ross Wood, she pointed out to me that there is a logic of the mind and a logic of the eye. That means you can make a floor plan—a scheme of a room on a paper—and then, when you put the room together, it might not work as perfectly as you thought it would."

"When you are decorating, you must learn to break some rules, but not all of them. Take the case of pattern on pattern. Some decorators today think that you can willy-nilly mix prints. Not so. That just results in confusion. There always has to be some connection if you use more than one print: color, curves, lines—a connection. Speaking of connections, I think it is very important when mixing furniture of different provenance that there be some kind of connection, so that they can be neighbors—such as placing a superb modern table to an antique chair. If you put a reproduction table next to the antique chair, it would look all wrong. There wouldn't be any connection of quality."
A careful logic order, based in the consciousness of visual perception and planning, is not enough to make good architecture. The logic order demands the approval and contribution of the sensible aspect provided by the emotive system. It is by the effect that symbols and signs produce on the emotive system, that the sense of quality and order is attained as a result of the emotional response. Do not confuse this emotional response with over-sentimentality—provided by the anecdotic verbalization of the connotations that are related to the buildings. The emotions I am referring to, are abstract, and they have to be understood first as emotions without anecdotal connotations. A simple matter of reacting to the quality of forms and to the order that one can feel.

The problem of semiotics in understanding symbols is translation. The translation into a sensitive aspect what belongs to the emotive. They are two different things, two different aspects that demand being felt
simultaneously, each of them in their own way. And
the method to understand either one is not the
translation into the other.

3. I do not want to talk about the supportive
disciplines to the practice of Architecture, because
this paper is not an implementation of an educational
program, and the conflicts in this supportive fields
are contained between conceptualization and
implementation dealing with specifics.

4. Perhaps the last chance that by now one has, to
improve definitely and directly the education in
Architecture, is the enhancement of motivations. The
vocation and talent of students vary in depth and in
range. Vocation has to do with the emotive aspect to
a great extent, but also with appropriate sensitive
skills that complement them. Vocational conflicts
probably lye in conflicts between the two types of
motivations mentioned in chapter two. And
architecture schools can do little about it. Vocation
is a long term motivation that can grow or not.
But education is more likely oriented to enhance certain skills and to kill creativity than to enhance motivations. Long term motivation is not yet the problem to attack. It is generally maintained in the students, imposed by other commitments and decisions upon which schools can do little. But what architecture schools surely can do, is to improve the motivations for at least some period—by providing the students a contact with a good quality practice. It is in contact with this good quality practice, that the spirit of architect is forged. Not every student has access to work in an office where the activity is oriented to guide him, to explain to him the whys and hows of the making. And even less are the number of students and professionals that have the opportunity to train in an office where good material is produced. This lack of contact with quality has an overwhelming effect in motivations, in developing skills, and in learning how to feel towards buildings. Because man develops motivations only through experience.
Although the studios, as the core of the education should not disappear. But there has to be a parallel contact at the same time, with a real making of projects and construction of buildings. The education is already dealing with many metaphors, and a direct contact with the objects of which education speaks is a must.

I conceive architecture schools lodging officers in which the goal, would be the quality of the product. Commanded by talented architects that would transmit to the students what they know, not so much by means of words, but by means of sharing their experience. The implementation of this idea will be complex, because it will demand a compromise towards trends. Therefore, there will have to be a variety of practicing architects working different projects with different groups of students. There will probably be identification from the students towards the work of the architect with whom they are working. But this identification is necessary for some time.
I am very realistic in this proposal. So much that I think that these offices should be managed by the headquarter of the school, offering good quality work, at moderate fees. They could be oriented towards the needs of the community, the town hall, or the state. There would be some conditions to accept the commissions, and also some conditions upon the institution or person that demands the services. The process of production should be didactically oriented, and the product should demonstrate high quality. These offices should not compete with the rest of the practice in the city, although there might be complaints from other practicing architects. These conflicts have to be solved with the orientation and philosophy of both, the school and the architects that will be leading the school's offices.

Students will be in contact with all stages of project, and also with a stable department of production where working drawings would be elaborated. A parallel office in Architecture
Schools, will be able to employ their students in the production department, according to a convenient schedule, to the students' availability of time.

Students will be able to make some money, and will be demanded quality in their work. The school will have some profits too, that could be used in other projects and in financial aid to the students.

But, the individual creative work at studios must continue at the same time. And I think that there will be a difference in the level of projects that students will make on their own. They will be better.
CONCLUSION

Creativity is the integrative way that man responds to the necessity of making, by allowing his six creative abilities—questioning, understanding, intuition, idea, fantasy, and imagination—to provide elements to the making, according to the approach that the to be created object requires.

Creativity manifests in types: primary and secondary; and in levels: expressive, productive, inventive, innovative, and emergentive. This classification in levels was provided by Dr. Irving Taylor. The first four levels exist in secondary creativity, and the primary creativity manifests in the emergentive level.

Creativity is applicable to the Arts, to the Sciences and to any other activity of man, even in every day life. It is basically oriented to the search of new orders, more accentuated in the advanced levels of the Arts and the Sciences. Therefore, intuition, the ability to find information by uncommon, and even unconscious associations
is essential in the advanced levels of Arts and Sciences. Arts deal with orders directly perceivable by the senses, that have to be discovered or invented by the artists. Sciences deal with orders hidden to the senses that have to be found by the scientists.

Creativity in itself cannot be taught. But the barriers that impair the flow of the creative abilities can be torn down or diminished. These barriers are in the emotive and in the sensitive parts of man. The methods for blockbusting them are based in reinforcing in the individuals the functioning of the two, the sensitive and the emotive, by means of conscious and unconscious ways, such as James L. Adams indicated in Conceptual Blockbusting.

Architecture is a humanistically oriented discipline that from different points of view and approaches looks for the conciliation between the building and the natural environments. The similarities between the practice of architecture and the Sciences are contained in the supportive disciplines where architects have to deal with orders hidden to the senses. The similarites of the
discipline with the Arts appears in the symbolism with which Architecture also has to deal, the visible order that affects the environment, its visual communication.

The scale and cost of Architecture are, however, different from those of the Arts, implying different responsibilities. Architecture should be nourished from the experiences in the Arts, but it cannot experiment in the same way that the Arts do.

Architecture needs to deal with symbolism. Symbols connect with both the emotive and the sensitive in man. And neither of them is perfectly translatable into the other. They are two different aspects that have to be treated differently. What the emotive system reads accompanies what the sensitive system reads. But the logic of the emotive is not translatable into the logic of the sensitive. And the other way around.

The role of the education is to train man in order to enable him to produce the cultural achievements necessary in building the civilization. Therefore, civilization,
culture, and education are inter-dependent. By means of the cultural achievements, civilization reinforces the first and the second aspect of man. The education has to reinforce the third aspect.

Education would have to act upon the sensitive and the emotive of the third aspect, to allow the development of the creative abilities that will nourish culture and civilization. It is creativity and not making which produces the cultural advances that civilization needs in its process. Therefore, the necessity of education to reach both levels, whose interaction allows the dynamism that the creative process demands.
Finally, the education in Architecture, on which I want to apply the conclusions of this paper, presents particularities.

There is less to say about the supportive disciplines that students must learn than about the part of Architecture that is close to the Arts, and consequently to symbolism. This is a part that cannot be described to the students. They must feel it. The problem is then how to make them develop these feelings.

Symbols are read by both the emotive and the sensitive. A part of them affects the sensitive, and another part of them, the emotive. Emotions are an abstract entity. They are the way man reacts to signs and symbols. But signs and symbols are already overloaded with connotations, a second meaning that also affects the emotive. As man's consciousness is based on the sensitive, the trend is to translate into it all what belongs in the emotive. Since in fact, man knows little about the emotive, he has to rely only on his consciousness. Man cannot yet conceive of his emotions as an abstract entity that perceives
order. He has to see them through the effects that signs and symbols, and furthermore their connotations, produce on his emotions. The contributions of the modern Art were important in allowing an understanding of perceptions without the interference of connotation. The attempt of semiotics as applied to architecture, was to clarify these issues, in order to incorporate them into the practice of design.

But I have come to the conclusion that there are aspects that are not translatable. That can be learned more quickly and more efficiently by direct experience where they belong. The duality implied in the symbols demand a dual experience by the sensitive and the emotive. Not translations from the one into the other. Therefore, the necessity of providing through the education that contact with talented architects, mentioned in the fourth chapter, and with their projects and buildings. That would be one way to develop in the students feelings towards Architecture and its symbolism; and the way to teach how to feel when creating in Architecture. A sort of apprenticeship in which the intuitions of craftsmanship will evolve into intuitions of creativity.
A sort of apprenticeship by which the students will develop their intuitions in the craftsmanship of design, that will benefit the development of their own creativity. This could be obtained by annexing offices to the Architecture Schools, where the commissions taken would be oriented towards dialectic issues.

This innovation would also help to consolidate motivations in the students. Since motivations are developed by the experience, it would reinforce them quantitatively and qualitatively. The education would be accompanying the creative process. Indirectly stimulating the emotive aspects by the contact with talented architects and their work; and directly acting upon the sensitive aspect of the students. The relationship between creativity and Architectural education should not be "creativity within the educational process", but instead, "architectural education within the creative process".
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