

Where do Melodies come from?

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Personal Journey

As a child I was sure I would be a composer when I grew up. More than anything else in life, I loved music. Indoors, I was permanently glued to the radio; when I went out I would sit under any window from which I could hear a piano playing. I even used to climb to the roof of my town's concert hall where I had found an open hatch through which to listen to the music, and even see parts of the stage. By the age of 10, I already knew hundreds of musical pieces by Mozart, Haydn, Beethoven and others by heart and drove my friends and family crazy whistling, humming or singing all day until they pleaded for silence.

At home we didn't have a piano, gramophone, or anything else that played music, except a radio. But even when music did play on the radio, my family would immediately switch to another station to listen to news broadcasts. Even though my family could not afford to give me an education in music, with a childish sense of omnipotence, I was sure that if I was determined enough, I would be able to study music on my own. I got special permission to use the piano at school in the evenings when nobody was in the building, took the old music notes of friends who had studied piano with a teacher, and deluded myself into believing that if I had enough stamina, with time I would become a great musician.

When I was about 12, I found books on music theory, history, and orchestration and learned to read orchestra scores. I tried to adapt known songs for the school choir and write orchestral accompaniments, variations and other kinds of music. However, when, at last, in my final year of high school, my musical ability was recognized and my teachers awarded me a special grant for advanced study in the academy of music, I began to hesitate. I wasn't sure I was talented enough to become a professional composer. I had tried for years to compose new pieces for the piano or choir but had never succeeded in creating anything truly original. I had by that time memorized more than a thousand classical pieces and musical themes, but

decided that only if I could invent at least one melody at a high level, only if I could tell one of my musical friends that a piece I had written was actually composed by a known composer like Schubert or Mendelssohn and they believed me, only then would I accept the grant. Unfortunately, I didn't succeed and finally had to accept that I would never become a composer, a conductor, or even a performer since I had never even been able to play the piano better than an amateur. I made the painful decision to turn down the grant and explained to my teachers: "Sorry, but I do not have enough natural talent to transform a hobby into a profession". After refusing the grant, I was invited for a meeting with the head of the academy of music who tried to reassure me by saying, "you can still achieve anything with your talent, strong will, and hard work." However, I already knew that I was a lost case. I did not doubt my ability to learn solfege, harmony, counterpoint, orchestration, or composition, and I knew I could even compose some "interesting" musical noises, like those of my friends who had decided to become "modern composers," but I also knew that if no fascinating original melody, motif, tune, or even harmonic or counterpoint movement had come to me by the age of 17, it never would.

After coming to this decision, I tried to forget my dream and continued, along with my friends, the regular course of life for young people in those remote days of the rise of the state of Israel – army service, settlement in a new Kibbutz somewhere near the border, and working as a farmer in the fields. After several years of fulfilling what seemed to me to be my Zionist duties, I left the Kibbutz, went to University, studied medicine, practiced for a time as a general practitioner, specialized as a psychiatrist, finished my training in the Israel Psychoanalytic Institute in Jerusalem, and established a clinical practice as a psychiatrist and psychoanalyst.

Only at this stage, after being appointed as a lecturer at the Hebrew University and the Psychoanalytic Institute, did I go back to my original interest – music and the arts. Only later did I realize that I had done what many generations of frustrated creative artists had done before me; they were forced to accept their lack of creative abilities, but, unable to discard their love of the arts, had continued this passion as teachers, theoreticians, researchers or critics. As the famous saying of George Bernard Shaw goes: "One who knows – does; one who doesn't know how to do – teaches" (in the School of Education at the University, where I lectured for several years, we used to add to this saying: "...and one who doesn't know how to

teach - teaches teachers.") Gradually, in my research and teaching, I found myself focusing on two topics: the psychology of creativity, and psychodynamic theories of music.

Throughout these years, at the back of my mind, lay a question with which I was almost obsessed: "Where do melodies come from"? Over the years, the question broadened: "Where do the creative ideas come from – visions to a painter, lines to a poet, narratives to a writer, movements to a choreographer?" I can remember even dreaming of finding, one day, the fount of creative ideas and detecting a chemical, a psychological treatment, or a brain center to enhance the outflow of these fountains. I still hope that one day in the future such a magic key will be found, but I am also sure that I will not witness it.

I decided to learn more about the creative process by searching through interviews with creative artists and examining how they themselves describe their moments of creative inspiration. (I am not responsible for the historical authenticity of these statements.) For example - when describing the famous "Hallelujah" movement of his oratorio *Messiah*, George Friedrich Handel said, "I felt like the good God took my hand and guided it along the sheet I wrote on, letting me only look at it after it had been completed". Anton Bruckner claimed that the main theme of the first part (Allegro moderato) of his 7th Symphony came to him in a dream. In a letter to someone who had asked him about his composition, Wolfgang Amadeus Mozart said that usually a whole part of a concerto or symphony appeared suddenly in his mind as though folded in a closed envelope which he only had to unfold and stretch out to copy on paper, something that he could do even while sitting with friends in a noisy inn.

Johannes Brahms described his process of creativity: "There is no real creating without hard work. That which you would call invention, that is to say, a thought, an idea, is simply an inspiration from above, for which I am not responsible, which is no merit of mine. Yes, it is a present, a gift, which I ought even to despise until I have made it my own by right of hard work... It is as with the seed-corn; it germinates unconsciously and in spite of ourselves" (quoted by Peter Ostwald, 1990, p. 302).

When looking into other arts, like poetry or drama, the descriptions are not any clearer. Samuel Taylor Coleridge confessed that his famous "Kubla Khan" was written during an opium induced stupor, and Samuel Beckett, when asked who Godot is, said that he doesn't know, but added: "I assume that if I did know, it would certainly be written somewhere in the play. But please – look into the text, maybe you will find it".

What is common to all these descriptions, unless you believe in the intervention of "the hand of God", "the muse", or any other supernatural power, is: "I don't know from where this piece of music / poem / painting / story / or dance has come to me. I only know that it was not I who created it!" This reminds me of the anecdote about Franz Schubert who was asked by a benevolent women's organization to donate an original lied to be performed at one of their charity parties. For this event he composed his magnificent "Staenchen" lied. While he was listening to it being performed by a small women's choir, he started to cry. When asked what had happened, he said: "I wrote it only yesterday and it is the first time I have the opportunity to hear it. I didn't know that it was so beautiful". But if the composer himself does not know where his art comes from - who can know? When each of these artists, and hundred of others quoted throughout the history of art, insists that it wasn't he who created his salient ideas, why should we not believe them?

Since I could never believe in the muse, the spirit of God, or any outer force responsible for creative inspiration, it was clear to me that the source has to be found somewhere in the unconscious part of the creator's mind, in some mysterious inner sovereign agent acting on its own. Every one of us is familiar with this agent from our dreams, and is familiar with the experience of there being some anonymous "He" inside us who takes advantage of the helplessness of sleep and feels free to tell us all kind of stories, turning on our inner television screen and showing us weird movies, and sometimes frightening us so badly that we cry for somebody to wake us. That experience, of the dream created by some "not-me" agent, is such a universal one that representations of it can be found in most mythologies.

"He" is also known to us from all kinds of slips of the tongue and other *parapraxes*, dismissed by us mostly as trivial errors of speech or behavior, but often experienced as not so innocent, giving us the feeling that a wicked jester is sitting inside us performing dirty tricks at our expense, making us reveal as if "by mistake" exactly what we intended to conceal, or embarrassing us by making our listeners laugh at us. Sometimes we even experience "Him" as an enemy trying to put a spoke in our wheel.

For example: Several years ago I had to have a critical surgery and was confined for a long time to the hospital bed. A day after returning home, I decided to start seeing my patients but in order to conceal my frailness, I tried to make a little show of bravura. While approaching the door to meet my first patient who rang the bell at 8 a.m., I pinched my cheeks

not to look so pale, straightened my back, opened the door, shook his hand vigorously, and greeted him with a cheerful "Good evening!" This patient, who was a candidate in training analysis, apparently knew, as did most of my colleagues at the institute, that I had undergone brain surgery and naturally was very concerned about my ability to continue as his analyst. I tried to laugh in embarrassment about this slip of the tongue but in fact was furious at "Him": "Why spoil my little show? You know very well that it is not about my physical condition, but about my mental state that this patient is really concerned, so why invent exactly this wicked trick?" I tried of course, as a good analyst, to reveal the latent meaning of this "error" and to justify it as a sincere warning from my unconscious to prevent me from resuming work too early, but I couldn't forgive 'Him': "Couldn't 'He' invent a better trick? Even if 'He' had made me faint while opening the door, it would have been a more honest trick than presenting me as mentally confused!"

The best examples of people oppressed under the tyranny of 'Him' are the neurotics and especially the obsessive-compulsive ones. As psychiatrists or psychologists, we are often witnesses to the agony of a patient trying in vain to resist the irrational commands of such an inner tyrant. When 'He' commands, for example, to check the closed door exactly three times before leaving home, nothing will help. The neurotic may try to resist, but 'He' will raise the anxiety and stress levels until the neurotic is forced to surrender, and, to retrieve his peace of mind, obediently fulfills the command,.

In fact, everyone, including the so-called normal person, has his own small obsessions, compulsion, prejudices, or irrational ceremonials like touching wood, avoiding black cats, or not being the 13th participant at a meeting and everyone also knows how difficult it is to resist such behaviors even when knowing they are irrational and superstitious.

But nobody knows 'Him' better than the creative artist: for him he is the fount of his original ideas, fantasies, visions or melodies. 'He' has been described in hundred of writings, poems, and interviews by various artists as their best ally in their creativeness, and, at other times, as an enemy who deliberately obstructs the flow of original ideas, sometimes as the blessed muse who urges them to create, and at other times as somebody they have to struggle with to not abandon them. But whether described as generous and benevolent, or as abusive and withholding, 'He' is always perceived as unpredictable and uncontrollable.

I believe that every individual who has ambitions to create something original has developed some inner idiosyncratic image of 'Him'. I imagine 'Him' to be like a tenant who

has settled down in the cellar of my house. He does as he pleases without asking my permission or considering my opinion and ignores my pleas and reproaches. With time, I get more and more ambivalent about him. While I appreciate his intelligence, shrewdness and talents and am fond of his fascinating night time tales, I am also annoyed at his habit of ridiculing me with his interjections and am angry at him for showing me his horror movies at night. Sometimes I am even close to becoming paranoid, feeling that he is taunting me by giving me a glimpse of what he seems to offer only to withdraw it the moment I reach for it. More than anything, I want him to sing for me and teach me his original melodies. Most of the time, however, he refuses stubbornly; sometimes in my dreams he lets me listen to magnificent pieces of music with beautiful melodies, but the minute I wake up and jump out of bed for a pencil to write down the melody, he immediately pulls it back, leaving me with the frustration of almost holding an original tune in my hand but having it withdrawn the moment I reach out to grasp it. How could I explain such a trick, if not as a cruel attempt to mock my highest ambitions?

In fact, I have no control over him, no way to manipulate him; I can't choose the movies I want him to play in my sleep or ask him to stop his interjections, and I certainly cannot persuade him to bestow upon me some of his original ideas. All I can do is follow and observe him constantly, to learn how he thinks and responds, what his considerations are, and how he makes his decisions. Maybe, if I know him better – maybe I will also find some way to control him. I have to admit, that to this day I haven't yet found any way to influence him, but after more than forty years of inquiry, I believe that I have at least acquired some knowledge which may perhaps assist other interested colleagues in their own investigations. The sources I have learned from, and will present here, are: 1) The writings of Freud and his followers; 2) My own 'He' (the only one to which I have privileged access); 3) The 'He's of my patients, as I learned to know them from their dreams and free associations; 4) Recent findings in brain sciences and cognitive psychology.

And finally, in order to appear a bit more scientific, from now on I will call 'Him' - "Factor X".

Freud

The origin of our knowledge of 'Factor X' is in Sigmund Freud's theories of the unconscious. Freud did not invent or detect the unconscious, which was a concept already widely used in philosophy and aesthetics at the time, but he was the first to introduce the concept into the world of science. Up to today, almost 120 years since Freud began writing about the unconscious, we are still not convinced that it is at all possible to study the unconscious using the methods of the natural sciences, as Freud assumed, and there is still disagreement about the feasibility of this basic premise. The problem is that in his relentless efforts to be admitted into the temple of the medical sciences of his time, he felt obligated to formulate his theories in a form compatible to the concepts and methods of these sciences. This often forced him to formulate his assumptions vaguely, and even in contradiction to some of his own previous assumptions.

From the beginning of my psychoanalytic studies, I found myself in a similar situation, I believe, to that of most analysts of our generation – being in a constant struggle with the writings of Freud. On the one hand, learning, teaching, and quoting him on any occasion, but on the other hand, arguing with him incessantly, and while reading him, searching, as though with a magnifying glass, for errors and contradictions. Let me present here for critical discussion the most problematic points, relevant to the issues discussed in this paper, which I found in his writings.

1) Freud, in his dynamic model, gave us that vivid and attractive image of the "psychic apparatus" as an arena in which several forces, partly conscious and partly unconscious, are in constant conflict – sometimes acting one against the other, sometimes joining forces - but never resting. These conflicts are rarely solved decisively, but mostly lead to some kind of "compromise formation". The prototype for this description was the phenomenon of dreaming, where each of the forces involved in dream creation was described in detail, and the dynamic relations between them was described as an interplay between several autonomous agents each pursuing its own purpose. But on the other hand, Freud, always loyal to the natural sciences, never allows us to carry this vivid image too far, and repeatedly warns us to treat it as a metaphoric description. In the "Introductory Lectures on Psychoanalysis" (1916-1917) he writes: "I hope you do not take the term too anthropomorphically, and do not picture the 'censor of dreams' as a severe little manikin or a spirit living in a closet in the brain and there discharging his office... For the time being it is nothing more than a serviceable term for describing a dynamic relation" (chap. 9).

My problem was that such an image, of something like an underground council of "little manikins" located in the cellar of the unconscious, was exactly the way I used to conceptualize the various parties involved in the production of the dream (as well as in the formation of neurotic symptoms), and in spite of my efforts, I could never think of a better "scientific" description of the dynamics of the dream. But the problem is that Freud, although warning us repeatedly to treat such description only as a metaphor, also never suggested a better description.

2) The first time I read *The Interpretation of Dreams* I was impressed, as I believe most students of Freud's writings are, not only by the cleverness of Freud being able to decipher this mysterious language, but by the cleverness of the dream-work itself. During my study of the first six chapters of the book, I frequently felt some uneasiness concerning several interpretations which seemed to me so elegant and sophisticated that it was hard to believe that someone's mind would really be able to make, in his sleep, such intricate considerations and calculations. Am I really so smart while sleeping that I can play with words, invent original symbols, or calculate mathematics that I can hardly manage fully alert and awake? But then I reached the anti climax of the seventh chapter, where all this unbelievable shrewdness of the unconscious is explained as nothing more than the result of a regression to our primitive and childish mental processes. A similar uneasiness I felt also in regard to several other unconscious productions described by Freud, like many of his examples of parapraxes, jokes and neurotic symptoms, which seem too intricate and sophisticated to be explained as being produced by primitive processes. In other words – it felt difficult to settle the discrepancy between Freud's clinical unconscious to his metapsychological unconscious.

3) The hardest problem for me was Freud's attitude to the narrative elements in the dream and his repeated warning not to pay too much attention to the narrative structure of the dream, and its manifest content. In his "Lectures" (S.E. 15) he wrote: "In general one must avoid seeking to explain one part of the dream of the manifest dream by another, as though the dream had been coherently conceived and was a logically arranged narrative." Freud argues that if dreams give the impression that they have been structured as a coherent narrative, this is always the result of "secondary revision": "...one part of dream-work... whose function is to make a more or less coherent whole out of the first product of the dream-work. In the course

of this, the material is arranged in what is often a completely misleading sense and, where it seems necessary, interpolations are made in it" (chap. 11). In the *New Introductory Lectures on Psycho-Analysis* (S.E. 22) Freud makes it clear that this revision "...makes its appearance after the dream has come into consciousness as an object of perception. When the dream has come into consciousness, we treat it in exactly the same way that we treat any content of perception; we try to fill in the gaps, we add connecting links, and often enough, we let ourselves in for serious misunderstandings. But this is, as it were, rationalizing activity, which, at its best provides the dream with a smooth façade..." Accordingly, he suggested: "...that we should divide the dream into its elements and start a separate inquiry into each element" - an approach we would call today "de-constructive".

For me, the narrative function of dream-work, the dream's mysterious ability to invent original stories and portray imaginary scenes on our inner screen, has always been the highest and the most interesting function of the dream, something amazing that often elicits the question after awaking from an iridescent dream: "Where have these strange scenes come from?" The dream, as Freud emphasized repeatedly, is the best looking-glass in which to observe the unconscious in action, the "royal road" to learning its language and understanding on what the unconscious is working. In contrast to the rational conscious mind, which speaks mainly in verbal language, the dream is able to efficiently use all available human media of expression – sounds, visions, movements, and the like and thereby succeeds in expressing emotions and personal experiences much more effectively than verbal language. Consequently, a narrative produced by the unconscious is generally much more diversified, expressive and richer in meanings than a conscious narrative that is mostly confined to the medium of verbal language. An unconsciously produced narrative, as we experience in our dreams, is able to use all available media of communication, either as a multi-media show, or by using two or three media in various forms of combinations, or even by using only one non-verbal medium. From this point of view, we should also treat a melody as a narrative, told by the unconscious not by words, visual images or expressive movements, but only by the auditory medium. So, if we return to our opening question, "Where do melodies come from?", the place to look for an answer is in the narrative capability of the unconscious, and the best resource for learning about these capabilities is the analysis of dreams.

What I found particularly perplexing about Freud's approach was that his obstinate rejection of the significance of the narrative contents of dreams doesn't fit with his own

technical approach to the interpretation of dreams. He was the one who advocated listening to the dream with evenly suspended attention: "...in a state of easy and impartial attention, to avoid as much as possible reflection and the construction of conscious expectations, not to try to fix anything that he heard particularly in his memory" (S.E.18:239-240). Today we would call this kind of listening "non-theoretical", i.e. avoiding the imposition of any pre-conceived theory, interpretation, or explanation on the material, on the dream, while trying not to decide in advance what material should be regarded as more or less important: "We regard nothing in a dream as accidental or indifferent, and we expect to obtain information precisely from the explanation of such trivial and pointless details" (S.E. 15, chap. 7.). But if anything related to the dream has to be regarded as equally significant and equally able to convey latent meanings relevant to the interpretation of the dream (even such trivial remarks as "this was a funny dream"), why disregard the narrative structure of the dream and decide in advance that it is not significant? Even if we accept Freud's proposal of deconstructing the dream into its components, why not look also at the manifest dream content, at its narrative structure, for potential additional meanings?

Freud, as we know, did not completely overlook the narrative content of the dream but considered it to be only a "secondary edition" like the work of a galley proof reader who hastily corrects senseless sentences in the bulletin before it is sent to the printer. It is interesting to note that a similar theory, apparently supported by brain research, appeared anew in the 1970s. Hobson and McCarley, at the Harvard Medical School, succeeded in locating the "dream state generator" that arouses REM sleep in the mesopontine tegmentum of the brain stem and concluded that dream contents are "inherently meaningless" and are aroused accidentally by sparks released by the lower centers of the brain that randomly hit the higher centers of cognition (1975). However, two years later, in 1977, after realizing that they could not ignore the seemingly coherent narrative structure of dreams, they claimed that it is nothing more than a façade of order imposed on the chaotic elements of dreams by the higher centers of the forebrain – in fact, a result of a secondary revision of the chaotic material released by the lower pontine centers, by the more rational forebrain.

The crucial question is – what is the difference? Even if the "secondary reviser" of the dream isn't a member of the editorial board sitting in the cellar of the mind (or the brain-stem) but sits somewhere in the upper story (or the fore-brain), it still belongs to the unconscious functions of the mind and as such is not subordinate to rational control and not amenable to

conscious reflection. Whether or not there is a difference in the location of the "reviser", whether it sits "higher" or on the same level as all the other functions of the dream-work depends, in fact, only on the theoretical perspective of the observer. If he or she is hierarchically minded and ranks any unconscious function according to its proximity to conventional logic, he or she may rank the editor "higher" in regard to the other functions and locate it in the higher centers of the brain. But if the observer treats all unconscious functions as equal, without imposing any hierarchical rank order on them, although he or she may still consider revision as a separate function, he or she will have no reason to rank it as "secondary" to any other function. To my mind, as I will try to prove later, we have at present no scientific evidence to justify ranking mental functions according to any of the accepted criteria – such as evolutionary order, brain location, and the like - and therefore, at least until we have more information, we should refrain from ordering mental functions hierarchically in terms of higher or lower function.

So, all we can say today is that somewhere in the cellars of the unconscious, among the staff of that office called "Dream Work", sits someone whose function is to write stories and arrange visual scenes, tunes, and voices into narrative structures, an agent I would call "Narrator". The question of whether he creates his narratives from scratch or composes them from pre-prepared elements sent to him by other staff members for "secondary elaboration" seems to me to be irrelevant. Both tasks require an investment of equal effort, creative imagination, and talent. In many of the psychological tests designed for measuring levels of intelligence and creativity, the examinee is given some words or sentences and is asked to use them to compose a reasonable cohesive story. It is clear that the psychologists who have written these tests also think that the task of composing a well-structured narrative out of given pieces of material requires the same degree of intelligence as the writing of an original story. Most creative artists also do not distinguish between a request to compose an original piece of art and a request to compose such a piece out of known elements, because they do not consider the latter task as requiring less skill, talent, and creative endeavor than the task of composing something original with no given specifications. The most popular music of Paul Hindemith, for example, is his "Metamorphoses on themes by Weber" and no one would regard the music of "Pulcinella" (based on themes by Pergolesi) as inferior to any other ballet music by Stravinsky based on original tunes.

At any rate, the entire hypothesis that the dream is produced in the lower centers of the brain while only its final edition is created by the higher cortical centers is no longer accepted by contemporary brain scientists. Recent brain imaging studies have shown that a whole group of brain centers, including the limbic and the visual systems, are involved in the production of the dream, while the pontine centers marked by Hobson & McCarley as instigating the dream are only responsible for igniting the REM phase of sleep. If one compares the dream to a show performed on the inner stage of consciousness during sleep, these brain stem centers act only as the theater stage workers preparing the stage for the performance – turning on and directing the lights, turning on the sound system, maintaining surrounding silences, and ensuring that none of the noise made on the stage will leak out to the systems of motion and behavior. By the way, only around 80% of dream activity occurs at REM sleep, while 20% occurs in the NREM (non-REM) period, when the theater stage has not yet been prepared for the performance. In any case, we are still also far from locating each of the other members of the dream-work team, especially the "Narrator", in a specific brain center, module, or network.

My Struggle with Freud

As a candidate at the psychoanalytic institute and as a young lecturer teaching psychoanalysis at the university, I did my best to defend the ideas of Freud. In regard to the first problem presented above, that of using anthropomorphic metaphors, there was no problem. Many sciences, including most of the natural sciences, regularly use metaphorical models to present their new theories and often do so long before they have been able to provide hard evidence. You can always use the excuse of "this is only temporary, until scientific research will advance and be able to prove it...", and who really cares, especially in the behavioral and social sciences, if that "temporary" time frame lasts for centuries?

My difficulties were especially with the second and third problem which represent, as I learned later, one of the most controversial issues in the theories of Freud. In his paper "Two theories or one?" George Klein claims that Freud developed two different kinds of theories, one clinical and one metapsychological: "The distinction is exemplified in Chapter Seven of Freud's *The Interpretation of Dreams*, where his explanations are on a level entirely different from that of the first six chapters of the same book" (p. 41). In the first six chapters of *The Interpretation of Dreams* Freud used his clinical approach, a group of theories "that concern

themselves with the 'why' of behavior, that try to state reasons rather than causes, that try to say that a behavior has a certain meaning derived from the history of that meaning in the person's life, that try to speak of the psychological functions through which the meaning is expressed" (p. 56). But Freud, always loyal to the positivistic-deterministic approach of the natural sciences, knew that while he could use intentionality for interpretation, it couldn't be used for explanation, and it was therefore necessary to also propose a deterministic theory to explain the 'how' of the dream. This theory, which was extended to explain the mechanism of the formation of all neurotic symptoms and was later formulated as the 'economic model', was first presented in the seventh chapter. Klein contends that the two theories, the intentional clinical one and the causal metapsychological one, also represent two different levels of explanation not translatable and not reducible one to the other: "Freud's metapsychology... reduces human behavior to a conceptual domain which requires a kind of observational datum different from that available in the analytic situation." The main loss, then, is that "Metapsychology throws overboard the fundamental intent of the psychoanalytic enterprise – that of unlocking meanings" (p. 48).

Klein's critique is certainly correct concerning the state of the natural sciences at the beginning of the 20th century when these sciences were still dominated by the motto of Galilei - "The book of nature is written by the letters of mathematics"— and all the natural sciences were required to reduce any qualitative phenomenon to its quantitative parallel (e.g. – colors to segments on the light spectrum, tones to lengths of waves, and so on). This requirement prevented the natural sciences from dealing with any phenomena that couldn't be reduced to a parallel quantitative formulation, especially anything related to the representation, translation, conversion, or other kind of manipulation of meanings. Freud, as we know, complied with this requirement by adopting the concept of energy and its various forms of transformation as the basis for his quantitative model (the economic model). This model had been proven to be good enough for dealing with the various aspects of motivation, but, as became evident with time, totally inefficient in dealing with anything related to meanings.

However, Klein wrote his paper at the end of the sixties, already after the appearance of Cybernetics (Norbert Wiener, 1948) on the stage of science, and the beginning of the development of computer sciences. The new concept of "feedback mechanism" enabled engineers to build aim-directed devices (such as missiles which direct themselves to their target) set in motion by pre-programmed mechanisms. Many philosophers of science were

even so enthusiastic about the new possibilities for explaining and planning intentional systems on the basis of causal mechanisms that they announced that this discovery practically solves the two and a half millennia debate of determinism vs. teleology and opens the way to explaining deterministically most of the intentional phenomena. This development, they believed, would liberate the behavioral, social, and biological sciences once and for all from the dread of anthropomorphism and "the ghost in the machine." This enthusiasm was premature and the problem of the legitimacy of anthropomorphism, as will be discussed later, has not been solved up to the present day. But we have to admit that with the development of computer sciences, it has become possible to write more and more software programs capable of dealing with various aspects of meanings, and, with their assistance, to reveal the deterministic mechanisms underlying more and more biological and mental processes which were previously considered as intentional (one of the main tasks of "Artificial Intelligence").

One of the disciplines that have gained a lot from this development is linguistics. But we have to remember that in the sixties, the period in which Klein wrote his paper, it was still believed, even by linguistic experts, that it would never be possible "in principle" to write programs for the translation of one language into another. Because dream interpretation is in its essence an endeavor to translate the language of the dream into a "secondary" language, it was also considered to be impossible "in principle" to interpret dreams using the methods of the natural sciences, a belief that motivated many psychoanalysts to move from the camp of the natural sciences to that of the hermeneutic disciplines.

Recently, I attended a lecture by a distinguished Israeli professor of computer sciences, who said: "The whole history of the computer is a sequence of solving problems that were declared by philosophers and scientist to be insolvable in principle." I suppose that he is right because even the problem of translation programs has been solved recently, an advance that would give Freud the hope of applying deterministic methods even to the interpretation of dreams. There is, however, one component in dream interpretations that we are not able and will not be able in any foreseeable future (I am cautious not to say "never") to explain deterministically, that is – the narrative capability of the dream.

Freud couldn't of course have envisioned the development of computer sciences, but with his sharp intuition he presumably did sensed the danger of dealing with the narrative elements in the dream. He knew that by attributing to the unconscious (or our 'factor X') the

ability to produce meaningful narratives, he might jeopardize his entire project of including his "new science" in the natural sciences.

But, intentionally or not, with this omission, he also thwarted any possibility for psychoanalysis to contribute to the mystery of the unconscious sources of creativity and particularly to use dream analysis as a means for studying this. We may assume that Freud was aware of this deficiency and was even willing to pay the price for it. The evidence - already 25 years after *The Interpretation of Dreams*, he still claimed that: "...it must be admitted that it (psychoanalysis) throws no light on the two problems which probably interest him the most. It can do nothing towards elucidating the nature of the artistic gift, nor can it explain the means by which the artist works – artistic technique" (S.E. 20:65).

Thus Spoke My Unconscious

During those long years when I still tried to remain loyal to Freud and to justify his ideas, I began to notice that a new voice was gradually joining my inner debate – that of my own 'factor X'. While trying from time to time to analyze my own dreams, my associations led me sometimes to "day residues" related to several of the theoretical problems that had occupied my mind during the previous day. However, it took several additional years for me to realize that my dreams do not only represent my unconscious as it attempts to assimilate daytime intellectual experiences, but often also seems to actively participate in the intellectual debate, expressing "its" own opinions. The first instance which made me suspect that my dreams were actually arguing with me is as follows:

Dream I: "I was at an official ceremony or reception party where every guest arrived, one after the other, dressed in their best clothes. At one point, a very elegant young woman entered, dressed as a princess with a shining white skirt, and everyone applauded when she appeared. But when she came closer, the admiration gradually shifted to anger as everyone came to realize that in fact she was a dirty street-girl wearing white rags and had only disguised herself as a princess. When people began shouting that she had to be punished for spoiling the ceremony with such a trick, I said that this is really outrageous and the girl ought to be ...; and here came a complicated Hebrew word a complex derivative of the verb 'to nail'. I awoke from the dream with an elated and amused feeling, proud of my ability to invent such

a clever pun. It reminded me of my pleasure when, as a pupil in elementary school, I managed to arouse laughter in the entire class by shouting a "clever" interjection in the course of a lesson based on puns on the words the teacher was using (despite often being thrown out of class as a result).

But in the morning, after retrieving the dream, I began to wonder – what is so clever about that pun? Really, it was nothing to be proud of and was only a stupid and meaningless combination of letters. Then I remembered that the preceding day, while teaching Freud's dream theory at the university, I had told my students, among other things, that according to his theory, the dream is unable to invent new words and that therefore all seemingly original utterances appearing in a dream are in fact preexisting words or sentences previously stored in the memory. But it seems that my own dream-master was insulted by ascribing him such incompetence and at night, when on center stage, tried to restore his lost honor by challenging me: "Before repeating that foolish statement about me being unable to create original words, look at this word-sample! Have you ever heard such a word salad?" I had to admit – in spite of being meaningless, it was original.

Dream II: "I was walking in the streets of the old city of Jerusalem and, like nearly everyone in those days of heightened terrorist activity, was looking around nervously all the time to see if there were any suspicious characters plotting a malevolent act. Suddenly, I discovered a group of young men who seemed to me to be terrorists plotting an attack and attempting to intermingle with the crowd. I pretended not to have detected them, and looked around for one of the policemen or soldiers patrolling the streets to warn him. But when I saw a soldier, I realized that the terrorists must be aware that I had detected them, and that they were following me to shoot me the minute I approached anyone. Assuming that they were not interested in attracting attention by shooting one man on the street, I knew that I would be safe as long as I did not approach anyone to warn them. And then I began to wander in the small streets of the old city, passing through yards and jumping over walls, in an attempt to slip away from my followers in order to be able to warn a soldier before they could catch me. After a long time, which felt to me like hours, I got the impression that I had succeeded in misleading my followers and jumped over a wall into an empty place where two soldiers were patrolling, and after looking carefully around to be sure that nobody was following me any

longer, approached them to inform them about the danger. But the minute I started to open my mouth, I felt strong arms seize me from behind, and knew that I was lost".

I awoke feeling disappointed that I had failed to prevent the terrorist attack, but at the same time I felt offended – what a banal dream? I am not accustomed to dreaming hackneyed thriller story dreams so lacking in sophistication. But from my experience of analyzing dreams, I knew that peculiar habit of the dream of choosing an ordinary well-known narrative when it wants to convey a clear message. By the way, that tactic is also common in art. A good example is the movie "High Noon" (1952) where the script writers, John W. Cunningham and Carl Foreman, and the director, Fred Zinnemann, chose the most common and popular movie cliché' of those days - a western - to express their protest against the American film industry which had surrendered to the dictates of senator's Joseph McCarthy's committee.

My associations about the dream led me back to the memories of the previous day, to the dream-seminar in the psychoanalytic institute where I had presented my ideas about the significance of the narrative structure of the dream. One of the more scientifically oriented candidates challenged me by asserting that if I raise such a hypothesis, I am also required to suggest an appropriate method for proving or refuting it. Then, continuing the discussion by attempting first to outline the criteria for distinguishing a "well-structured" narrative from an accidentally composed one, we all agreed that the necessary distinction was that the writer of a good narrative has to already know how he plans to finish his story before he begins writing the first letter. Several members raised some doubts about whether this is really necessary for all good writers of narrative, but all agreed on one point – it is absolutely necessary for writing a good detective story or movie because you cannot begin without already having the entire framework of the plot in your mind. I, being occupied obsessively with the problem of how to prove the narrative capability of the unconscious scientifically, came to the conclusion, based on that discussion, that the first step in this direction has to be to find a dream which can be interpreted only on the assumption that the dream-master knew in advance how he intends to finish it, or even only – knew in advance how to continue it. But where could I find such a dream? I tried to survey, in my mind, all the recent dreams of my patients I could remember, but I couldn't find a suitable example.

The following night my own 'factor X', sensing its golden opportunity to re-prove its presence, provided me with the required sample – a detective movie in which the scriptwriter

succeeded in misleading me until the very last minute. He let me run for a long time in the labyrinth of the old city until I was absolutely sure that I was out of danger and then trapped me in a complete surprise. He proved his ability to plan a plot in which 'He' knows from the beginning what the end will be, but I remain ignorant.

In the next seminar I related the dream, but one member of the group immediately tried to dampen my enthusiasm by remarking: "No wonder! This was, in fact, a typical sample of the 'counter-wish dream' described by Freud. Because you wanted to refute Freud's theory, you invited such a dream". He was right, but does it really make a difference? In both cases, if it was my intention or if it was his intention, it wasn't I with my rational mind who invented the plot but some unconscious narrator not under my control. However, this remark made me realize— that I did not have to look so hard for proof when the required evidence is already hidden in the examples Freud himself presented to prove his 'counter-wish dream' assumption? Take for example Freud's interpretation of the dream of the patient he called: "The cleverest of all my dreamers", who, in the next meeting after he had explained to her that dreams are fulfillments of wishes, presented a dream whose narrative was obviously contrary to her wishes. Freud explains: "No doubt it was only necessary to follow the dream's logical consequence in order to arrive at its interpretation. The dream showed that I was wrong. Thus it was her wish that I might be wrong, and her dream showed that wish fulfilled" (1900, p. 184-185). But if, according to Freud's interpretation, the narrative content of the dream has been primarily created only for the purpose of "showing that wish fulfilled", how could it be explained as being the product of some "secondary editor"?

Dream III: The last dream I'd like to present is related to my experiences as a young general practitioner serving for one month in the army every year. In the dream, I was sent, as was the custom in those remote days, to some far away military field clinic and found myself in a nice small cottage on the shore of a picturesque lake deep in the forest. Since the whole landscape was not typical of Israel, I suspected that I was sent to some remote European country. When I asked the officer in charge of the clinic where we were, he answered in a matter of fact way: "In Bulgaria". I was curious and asked him for an explanation. I never heard that Israel had signed a military agreement with Bulgaria to exchange medical services or that there are any Israeli troops there. He was about to explain, but soldiers began to arrive at the clinic and we had to start to work, examining them, writing prescriptions, and all the other routine work of a

doctor in the army, so we couldn't speak. I became more and more curious about what I was doing there, but every time the officer was about to tell me, somebody came and asked for our care. Finally, after a time which seemed to me endless, and during which my curiosity had reached its peak, we were left alone, sat down quietly, had a cup of coffee, and he began to speak: "Now I will tell you...", but I woke up. I remained full of curiosity and even tried to fall asleep again to continue the dream, but didn't succeed; and until today I have no idea what he was going to tell me.

My only association was the play *Major Barbara* by George Bernard Shaw that I had seen several days' earlier on television. I had wondered why the director had chosen to set the play in Bulgaria of all places. But it was clear that the theme of the dream wasn't Bulgaria or any other content of the dream, but the feeling of somebody arousing my curiosity, arousing my suspense more and more, and suddenly leaving me without an answer. I had the feeling that the dream was trying on purpose to mock me in some way; had I again insulted "him" without being aware?

Two days earlier, somebody in my dream seminar had asked about that strange phenomenon of a scene appearing in a dream that clearly alludes to the content of a former dream, to some image or a scene which had been completely forgotten in the period between the two dreams. How can one explain this other than to assume that the 'dream-work' owns some private archive of memories not accessible to conscious daily thought where it can store material solely for its own future use? I have to admit that such an idea, that there are multiple memories, not accessible one to another, was too far-fetched then even for me to believe. So I began immediately to think about how we can prove that there is only one single memory archive common to all mental functions. After considering this problem for several days, I decided that the only way to prove a single memory archive would be to find a way to retrieve the seemingly forgotten memories of the dream into another phase of consciousness, like during a hypnotic trance or a mental state caused by drugs. Then it became obvious to me – my 'factor X' is again trying to teach me a lesson and make fun of me: "If you are really so curious about what I intended to tell you, let me see you find a method to dig this information out of me!" And again, 'He' had the last word. To this very day - I still don't know what he was going to tell me.

Primary and Secondary Processes

After completing the formal training requirements for being recognized as a specialist in psychiatry, being a member of the psychoanalytic society, and having published the sufficient number of "papers" for getting an academic degree, I managed to get a grant for one year of advanced study in scientific research and had the good luck to reach the Research Center of Mental Health at New York University, under the instruction of the late George Klein. In our first conversation, when I told him about my interest in the psychoanalytic aspect of art and creativity, he suggested that I first spend three months studying everything Freud and his followers wrote about the primary process which, in his opinion, was the key concept for understanding the psychoanalytic approach to the dream, the arts, and all other productions of the unconscious. I did this of course, but the three months gradually stretched to thirty years in which I continued to study the various aspects of the primary processes (summarized in my book *The Psychoanalysis of Art and Creativity* - 1999).

My first impression, studying the relevant literature, was that the Freudian concept of the primary process, although very useful for the interpretation of the dream and neurotic symptoms, is practically useless for understanding the phenomena of art and creativity. Even for the dream, for the interpretation of which Freud developed this concept in the first place, it may serve the analyst well for the interpretation of meanings and as a set of rules to decipher the dream's syntax and grammar, i. e. - for understanding what the dream is saying, but not for understanding why and for what purpose is it said. But the main problem in utilizing Freud's concept of the primary process for the analysis of art and artistic creativity is his assumption about the primitiveness of these processes, and his view of this activity as a phenomenon of regression. Even Kris's attempt to rescue the theory, his concept of "regression in the service of the ego", the suggestion that this regression is not a result of weakness, but rather of an ego which is strong enough to allow itself to dive into the depths of its soul to enrich itself with elements of the primary process – does not solve the problem. There is hardly anything "regressive" in superior artistic talent and creativity, and, even if we assume that the origin of the creative power of the artist is in his specific ability to enrich his secondary process activity with primary process elements, it still doesn't explain the achievements of the genius. The sum total of mature secondary processes combined with the infantile primary processes is still not enough to create a Mozart or a Shakespeare.

I decided to begin by first elevating the low status of the primary process, and in my first paper - "A revision of the psychoanalytic theory of the primary process" (1969) – claimed that there is no evidence, either clinical or otherwise, to support the common assumption of the primary process being "primitive", "lower", or "inferior" to the "highly developed", "mature", or "refined" secondary ones. I suggested that we treat the two as equally developed, refined, and efficient, and explain all the operational differences between them only as a result of the different functions each group of processes is assigned. Today I would use the metaphor of the computer, and compare them to two different software programs, each developed and designed for a different function. Like "WinWord" and "PowerPoint", both equally developed parts of "Microsoft Office", but one designed for writing text, and the second made for graphic, diagrammatic, and other forms of visual presentation. Each can perform, in a limited way, the functions of the other – you can write with PowerPoint, or make presentations with Word, but if you want the program to perform really well, you will use each for its specific purpose. Both continue to develop and improve from each "Office" version to the next, so that in any given phase of development they both represent the highest level of Microsoft's technical ability. The same is true for the primary and secondary processes – both are equally developed and exploit, in each phase of development, the recent cognitive processes that have matured at that phase, integrating new experiences and adapting to ever changing environmental conditions. The only difference between them is functional – the secondary processes specialize more and more in onto- and epigenetic human evolution, in all the functions related to reality orientation (perception, learning, guiding behavior, communication, etc.) while the primary processes specialize in all the functions related to the development and maintenance of the self (self- assimilation, adaptation, and integration).

I was surprised to discover that this new theory met, back in those remote years, with strong opposition from almost all psychoanalytically-oriented audiences to which it was presented (including my colleagues at our society in Jerusalem). It was hard for me to understand this resistance, especially since, in those days, it had already become fashionable to contradict Freud. However, I gradually began to understand that with this new theory, I had violated the principle, still sanctified by almost all schools of psychology and the neurosciences, of the hierarchical order of the neural and mental systems. Therefore, the

concept of two mental systems operating on the same level, without one being subordinated to the other, could not be accepted.

For 19th century neurologists it was clear that all the brain centers, and all the semi-autonomic neural centers located outside the skull, are arranged in a stable hierarchy and operate according to a built-in rank of command, like the Austrian monarchy - although composed of a lot of different nations, ethnic, and cultural groups, ruled by firm rank of barons, counts and dukes, and above all "Unser Grosse Kaiser". Freud was one of the first German speaking neurologists who adopted the new and more liberal model of Hughling Jackson, who presented a new concept of hierarchy - the higher level centers do not rule the lower ones but only inhibit and control their activities, so that each lower center is able to resume its autonomic activity if released from that inhibition. This hierarchy was more like Jackson's own homeland - the British Empire - in which each dominion kept its relative independence and was controlled by the higher authority only when some of their autonomic activities might interfere with the common interests of the United Kingdom.

Freud adopted the Jacksonian model for structuring all his consecutive psychological models – consciousness inhibits and controls unconsciousness, the secondary processes – the primary ones, the ego – the id, always according to the image of: "...a man on horse-back, who has to hold in check the superior strength of the horse" (364). Rapaport (1960) added: "Freud assumed that each advancement in psychic organization is accompanied by a new censorship, and his conception of the multiple layering of defenses within the ego also follows the same pattern "(23).

Brain-Split Patients

The first doubts about the validity of this principle of hierarchy appeared in the mid - 1970s with the now well-known pioneering studies of Sperry, Bogen, and others who studied brain-split patients. These studies began an era of endless preoccupation and talk about the "left brain" and "right brain" but, from our present point of view, the most relevant finding of these studies is represented by Bogen (1974) who described each of the two hemispheres as: "...a conscious system in its own right, perceiving, thinking, remembering, reasoning, willing and emoting. All at a characteristically human level, and both, the left and the right hemisphere may be conscious simultaneously in different, even in mutually conflicting, mental

experiences that run along in parallel, in fact – **two different people in the same person!**" (p. 11).

Gazzaniga (2002), continuing to study the brain-split patients of Sperry et al., showed that even if it seems as if the left brain dominates the right one, it is only because it knows how to "speak" better, like a politician who always succeeds in being the first to catch the microphone of the reporter who happens to be around, and therefore makes the impression that he is the one who is responsible for all decisions. Gazzaniga demonstrated that in many cases this hemisphere provides interpretations, even if it doesn't know why the second hemisphere responds in a particular manner. Referring to this tendency of one hemisphere to provide false explanations for acts performed by the other one Gazzaniga says: "We dubbed this creative, narrative talent the interpretive mechanism... The interpretive mechanism is always hard at work, seeking the meaning of events. It constantly looks for order and reason, even if there is none – which leads it continually to make mistakes. It tends to over generalize, frequently constructing a potential past as opposed to a true one" (p. 29-30) (what Freud called, one hundred years earlier, "rationalization"). Wilma Bucci (1997), who meticulously collected and presented all the neurological studies of these years that are relevant for psychoanalysis in her book, presents the wider application of these studies: "Gazzaniga has presented a view of the normal human brain as organized into relatively independent functioning units, or modules, that work in parallel; this organization accounts for shifts in awareness and the operation of unattended thought" (p. 165)

The Unity of the Soul

This new concept of a brain whose units are not working hierarchically but in parallel, began gradually to undermine one of the most accepted and sanctified belief of humanity – that of the "unity of the soul." Scientists knew, of course, for many years that the brain is composed of many units, each of which is assigned to a different function, but it was clear that somewhere in the brain there is a headquarter in which all neural and mental activity is organized, that although people have many "brains" they have only one soul. But now, how can I be sure that after I die only one soul of mine will stand in line before the gates of paradise?

The last eminent thinkers who tried to save the concept of the unity of the mind were the philosopher Karl Popper and the Nobel prizewinning neuroscientist John Eccles in their

collaborative book "The Self and Its Brain" (Popper & Eccles, 1977). Realizing the fact that the neurosciences have never succeeded in demonstrating that there is anything in the brain that may function as an overall organizing centre, they reached the amazing conclusion that the soul, or as they preferred to call it "the self-conscious mind" resides beyond and outside the brain: "The hypothesis is that the self-conscious mind is an independent entity that is actively engaged in reading out from the multitude of active centres in the modules of the liaison areas of the dominant cerebral hemisphere" (p. 355). This independent entity is of course in permanent contact and communication with the brain, so that each influences the activities of the other – a theory they called dualism-interactionism. But in contrast to the epiphenomenal point of view, Popper states: "I intend here to suggest that that the brain is owned by the self, rather than the other way around... the active, psych-physical self is the active programmer of the brain (which is the computer); it is the executant whose instrument is the brain. The mind is, as Plato said, the pilot ... Like a pilot, it observes and takes action at the same time. It is acting and suffering, recalling the past and planning and programming the future; expecting and disposing. It contains, in quick successions, or all a once, wishes, plans, hopes, decisions to act, and a vivid consciousness of being an active self, a centre of action... And all this closely interacts with the tremendous 'activity' going on in its brain" (p. 120).

This theory was in fact the last scientific attempt to differentiate the self from the brain, in fact – between the soul and the body. From then on, as Francis Crick and Christof Koch (2002) have stated: "A few neuroscientists, such as the late Sir John Eccles, have asserted that the soul is distinct from the body. But most neuroscientists now believe that all aspects of mind, including its most puzzling attributes – consciousness or awareness – can probably be explained in a more materialistic way, as the behavior of large sets of interacting neurons" (p. 11). And indeed, in the last thirty years almost all scientists are united in the common belief that the only substrata of all the mental processes is the brain, and that only brain research, reinforced by cognitive psychology and computer science, will provide the ultimate answers for all psychological questions. Recently, I even heard a well-known Israeli computer expert declaring: "The entire history of computer science is paved with problems that were announced by philosophers as 'insoluble in principle', but for which we have succeeded in finding answers. So don't worry, we will also crack the problem of the mind in the near future when we find the algorithm of consciousness." Whether this is reality or the megalomaniac vision of computer science, only the future will tell.

Anthropomorphism

One of my problems was, as mentioned above, that in spite of doing my best to adopt an objective "scientific" stance, I could never give up my inner conceptions, imagining the depths of the mind as the seat of an underground council of manikins, plotting how to manipulate our behavior. The sciences of the first half of the 20th century were relatively tolerant of this kind of anthropomorphic concept, in spite of the growing positivist attitude in the natural sciences, perhaps because it was understood that most of the behavioral and social sciences had no other alternatives. The survey of the literature of that period shows that in spite of the wide criticism of the theories of Freud, very few criticized him for his tendency to use anthropomorphic descriptions, especially after he himself instructed us to use them only as a metaphoric mode of presentation. Freud's known friend and later rival, Carl Gustav Jung, uses anthropomorphism widely without even bothering to apologize. In his writings, he used to argue with the unconscious, accused 'him' of many human faults, tried to educate 'him', and enriched psychology with a hypothetical monster – the collective unconscious.

But the second half of the 20th century was far less tolerant of anthropomorphism, especially following the appearance of Cybernetics on the stage of the sciences (Norbert Wiener, 1948). The new concept of 'feedback mechanism' aroused the hope that from now on it would also be possible to explain the function of aim-directed systems and devices deterministically by revealing the feedback mechanisms activating and regulating them. Many philosophers of science were so enthusiastic about the new discoveries that some of them even announced that by applying the new ideas of cybernetics, most of the two and a half millennia old problems of deterministic vs. teleological explanations in science could be solved. So, they believed, the behavioral, social, and biological sciences were finally going to be freed from the dread of "the ghost in the machine", "the homunculus", and so on, by the ability to explain even the most complicated aim-directed processes deterministically.

A kind of gentlemen's agreement was signed in this period between the sciences and the philosophy of science: You can continue to use anthropomorphic descriptions, but on one condition only – if you are able, if required, to also present an alternative intelligible mechanistic explanation for the operation of this process or device. And indeed, with the evolution of the computer and the invention of more and more computerized mechanical devices made to fulfill all human needs, the household, car, and office of the contemporary

middle class citizen gradually became filled with the ever growing stuff of "servers", "zombie agents", "voice messaging devices" and the like. All were designed mechanically to remind him or her about duties, to take care of material needs, to bring the hottest news, to correct letters, to entertain with stories, jokes, and music, etc. ("doing everything, except serving a cup of coffee"). But only on one condition is the producer or advertiser allowed to offer the potential customer all these kinds of "wizards" and "servants" without being accused of using witchcraft - only as long as they are able to present to anyone interested (patent officer or any other legal authority) the exact mechanism activating these seemingly magic devices.

Philosophers of science demanded the application of these new standards to psychoanalysis as well (e.g. Gruenbaum, 1984), and asked for the equivalent of "extra-clinical" evidence to validate findings collected in clinical situations. Many research-oriented analysts were ready to respond to this challenge with the hope that by using the findings of cognitive psychology which began to develop at that time, they would be able to deliver the required "extra-clinical" evidence. These efforts concentrated mainly on the study of the dream, which began after the discovery of the REM period in 1953, and the attempt to understand the function of the ego's defense mechanisms on the basis of normal cognitive regulatory functions. For example, there were studies that presented the defense of repression as a special case of attention-cathexis, or isolation as a special case of figure-ground differentiation. These efforts to get "extra-clinical" evidence from cognitive psychology and from the now fast developing brain sciences continue to this day, but it still remains unclear to what extent all these new and interesting scientific findings really contribute to our clinical theories and practice. There are still analysts who claim that the only changes observed, so far at least, are in the metaphors used in our "scientific" language. Instead of using metaphors taken from the world of power engineering as did Hartmann and Rapaport, or using concepts from cybernetics, or communication and information theories, as was common in the sixties and seventies, we now use modern concepts from contemporary brain sciences like "brain circuits", "neural networks" and the like.

Inspired by the new findings of neurophysiology, I dared for the first time to attack the problem of anthropomorphism head on. In a paper called "A Conversation about Anthropomorphism" (Noy, 1986), I tried to show that all recent theories that attempted to skirt anthropomorphism have, in practice, failed. So that we have no choice, at least till now,

other than to accept the idea that psychoanalysis is neither able to abandon its anthropomorphic concepts, nor to propose an alternate more "scientific" theory. Trying to introduce my ideas cautiously, I presented it in the following formulation: "I cannot find any way to explain several of the dynamic activities of the unconscious mind without assuming that some unknown factor there – let's call it simply, factor X – functions like an autonomous decision-making centre. This factor seems to possess the ability to receive information, process it, and decide autonomously how to respond" (p.150).

I was sure that most practicing analysts, spending most of their working days sitting with their patients, would be able to share this experience with me – feeling, while attempting to analyze a dream or understand the meaning of some aberrant thought or behavior, as if they have to communicate with some anonymous manikin, hidden somewhere in the back of the patient's mind, who tries to play hide and seek with them. Consider, for example, such a routine event as a patient coming late to his session, trying hard to justify his lateness. He tells you a long story about how he was called by his boss for a conversation at the last minute, how he missed the bus, how someone was blocking the entrance to the building, and so on. You don't accept all these excuses, but continue to look for what you consider to be the real reason for his lateness – some latent resistance against you, or perhaps the entire process of therapy.

But why don't you believe him and accept his excuses at face value? You are not blaming him for not telling the truth or hiding information, and you know that he himself doesn't know that which he cannot tell. So what is the point of asking a man a question to which he himself doesn't know the answer? It is only because you believe that although he himself doesn't know the answer, there has to be somebody inside his mind who knows, and is obviously with 'him' that you are trying to communicate. It is like you are saying to your patient: "O.K., I heard you, but it isn't you I have asked. Please let me to speak directly with 'Him', because I know it was 'He' who has planned this event".

Most of our clinical endeavors are directed, in fact, at succeeding at communicating directly with 'Him' and not wasting the time in meaningless conversations with the patient. In our clinical practice, we are all anthropomorphists.

The Homunculus

In the past, more than twenty years ago, I was still cautious to speak only about a 'factor X' without mentioning the forbidden 'homunculus'. But in recent years I decided finally that it is time to come out of the closet, and to admit that I have for years been a secret believer in the existence of all kinds of homunculi residing inside the human mind - not as metaphorical expressions or as hypothetical constructs, but as real entities supposedly composed of concrete neural cells that even may be demonstrated and located precisely in the future.

One of the reasons I decided it was time to come out of the closet is that recent developments in the neurosciences have set in motion a radical revolution in our conception of the human mind. The beginnings, as stated above, were in the seventies with the studies of brain-split patients, and in the consequent undermining of the belief in the 'unity of the soul' and the hierarchically ordered structure of the brain. David Oakley (1985) expressed the scientific atmosphere of the eighties when he declared: "The subjective unity of self, of thought and of personal experience is an illusion" (p. 147). It was a decade in which brain scientists ceased to search for the central organizing unit of the brain, and began instead to ask how the brain succeeds in maintaining a subjective experience of 'as if' unity in spite of being divided into many autonomously functioning units.

This new point of view – conceiving the unity of the brain and mind not as a natural given determined by the brain's very structure but as something for the maintenance of which the brain has to work constantly - drove brain scientists to return to and reconsider the vast knowledge that psychology has collected over the years about the ways the mind maintains its inner balance and its subjective sense of well-being.

It was interesting to see how some brain scientists, while searching for relevant psychological information about how the mind works, discovered anew the theories of Freud regarding the defense mechanisms. An example of this new generation of young brain scientists is Ramachandran (1998), who was ready to admit: "...that even though Freud wrote a great of deal of nonsense, there is no denying that he was a genius, especially when you consider the social and intellectual Vienna of the turn of the century. Freud most valuable contribution was his discovery that our mind is simply a façade and that you are completely unaware of 90 percent of what really goes on in your head... And with regard to psychological defenses, Freud was right on the mark" (p. 109).

He is willing to appreciate Freud for being the first to demonstrate the vital function of the defenses in the organization of our mental life, but blames him for never attempting to validate his theory experimentally. He is convinced that today we already have enough neurological evidence to demonstrate the neurological basis for the defense mechanisms Sigmund and Anna Freud described, such as denial, repression, reaction formation, projection, rationalization and even humor, and therefore are near to validating most of Freud's theories experimentally. So, maybe Freud's dream that one day in the future "the deficiencies in our description would probably vanish if we were already in a position to replace the psychological terms by physiological or chemical ones" (S.E.18:138) is going to be realized in our time.

It took about a hundred years for the brain sciences to accept Freud's theories about the dynamic unconscious and the function of the defense mechanisms. Let us hope that it will take less time for brain scientists to detect that their up-to-date "brain" – an organ ever active in keeping its façade of unity, reconciling opposing tendencies, and one part defending the other – is in fact a copy of the "organizing ego" suggested by Hartmann and ego psychology.

The recent rapid development of imaging techniques, like PET and Functional MRI, that enabled contemporary brain scientists to follow the brain even in its dynamic activities, also radically changed brain scientists' opinions about the problems of localization. It was proven that most of the higher organizing functions of the brain are not located in anatomical 'centers' that had been searched for since the phrenology of the 19th century, but are executed by 'modules' or 'networks' of neurons dispersed in all parts of the brain. Wilma Bucci (1997), as presented above, attributed, this finding to Gazzaniga, but in the meantime new and even more convincing findings were submitted by Christof Koch. In his book *The Quest for Consciousness* (2004), he presented the findings of his 15 years of conjoint work with the late Nobel prizewinner Sir Francis Crick, about what they called - the neural correlates of consciousness (NCC). Later Koch, (2007), summarizing this book, writes: "Every conscious percept is associated with a specific coalition of neurons acting in a specific way. There is a unique neuronal correlate for seeing a red patch, another for seeing one's grandmother, a third for feeling angry". The substrata out of which the neurons for each coalition are taken is, according to their findings, a relatively small group of pyramidal neurons located in layer 5 of the cerebral cortex, numbering not more than a million (out of 50 to 100 billion) neurons.

Most brain scientists today accept the idea that consciousness, and most of all other higher functions of the brain, are not localized in specific centers, but are executed by networks of neurons dispersed over a great number of brain centers. There is still no agreement on whether or not these networks are composed of a fixed coalition of neurons, as Koch believes, or as Susan Greenfield (2007) claims, big assemblies of neurons created ad hoc for each function. Either way, these new findings have changed all our concepts about the anatomical division of the brain because now we have to take into consideration two sorts of division: first - the well-known division into hemispheres, lobes and centers; and second - the recently discovered division into functioning networks (or modules), each spread over several centers, and each integrating activities from various brain centers. All these findings are still too new to sum up, but two conclusions have begun to become clear: first - most of the higher mental functions, conscious and unconscious, are executed and monitored not by centers, but by networks; second - various networks, and we still don't know how, which, and how many, are active independently in parallel, partly consciously and partly unconsciously. For example – I am involved in a vivid discussion with a friend while driving on a crowded highway. One neural network is totally involved in conducting the discussion, while the other at the same time controlling the act of driving. Each is functioning independently, mostly one consciously and the second subconsciously, while the focus of consciousness may shift dynamically from one network to the other: When I am concentrated on finding a new argument for the discussion, I am not aware of all the complicated maneuvers I perform while driving, but when suddenly I get stuck in a traffic jam, my attention shifts to what is happening on the road and I am not listening for a moment to what my friend is talking about.

This new sort of division has effected all our seemingly well-grounded concepts about the structure of the brain – its division into "lower" and "higher" parts, "dominant" and "subordinated" centers, "ancient" and "neo" areas, "primitive" and "high-developed" regions, and everything we pretended to know about the hierarchic order of the brain's structure. As we know today, most of the neural networks activating the higher mental functions are connected to many brain centers, including centers regarded as "lower" and centers regarded as "higher", so that, at least at present it is impossible to arrange the various functional networks into any kind of hierarchical order. If, to return to the above example, both functions, that of conducting a discussion and that of driving a car, require the involvement of most of the highest cognitive processes – perception, information processing, problem

solving, and so on. So, how can one decide what function is "higher"? Hence, at present, at least until we know better, we can only assume that most of the neural networks with which the brain executes its various functions are equally developed and efficient and each utilizes the best brain resources suitable for fulfilling its specific functions.

Christof Koch (2002), relying on these new findings, was the first brain scientist to ask why we shouldn't revive the concept "frequently ridiculed in science and philosophy... that there is a little person, a *homunculus*, inside my head who perceives the world through the senses, who thinks, and who plans and carries out voluntary action" (p. 298). He was even ready to declare: "Francis [Crick] and I believe that somewhere in the confines of the frontal lobe are neuronal networks that act to all intents and purposes like a homunculus... it is responsible for many complex operations, such as thoughts, concept formation, intentions, and so on" (p. 298-299).

But Koch has referred only to the network he was most interested in – that activating consciousness. But what about all the other networks, those called by Koch "Zombie Agents" and defined by him as "specialized sensory-motor processes... that carry out routine missions in the absence of any direct sensation or control"; what about many of those complicated semi-conscious processes, like driving or piano playing, that can be carried out for long periods of time without requiring any conscious attention? Why not to regard them also as "Homunculi"?

"Homunculus" is of course only a metaphorical concept, but a good one, because it express exactly the meaning we are interested in – a relatively independent inner mental agent assigned to a specific function, equipped with all the cognitive abilities required for the performance of that function (like perception, information processing, problem solving) that is free to decide whether and when to cooperate with other agents, and when to proceed on its own course. The main reason we haven't dared to use this anthropomorphic concept openly until now was, as assumed above, our inability to present a more "scientific" alternative. But now, knowing that the brain sciences are already on the way to demonstrating the neural correlates of at least part of the many homunculi monitoring brain and mental activities, why not use this concept openly?

The Submental and the Supramental

Christof Koch (2004) was also the first brain scientist who was willing to review the accepted notion about the superiority of consciousness, the belief that all higher and complicated mental activities have to be executed under the light of conscious attention while only those activities which can be reduced, after a period of conscious training, to the level of automatic performance can be transmitted to the unconscious: "The concept of the non conscious homunculus is not trivial... it is responsible for many complex operations, such as thought, concept formation, intention, and so on. Indeed I am tempted to label all such operations as *supramental*, given their location in the mind's processing hierarchy. Supramental processing is beyond conscious perception; this stands in contrast to the *submental* domain concerned with the more primitive processing stages that likewise escape conscious access". And he adds a sentence, I would choose as most relevant for the present paper: "The nonconscious homunculus proposal throws new light on certain other open questions, such as that of creativity, problem solving, and insight; it has long been asserted that much of creativity is not conscious" (p. 299).

Although most psychologists today are ready to accept the idea that around 80% of all mental activity goes on unconsciously, (what Piaget -1972 called "the cognitive unconscious") what they are referring to is mainly the *submental* functions, those "zombie like" automatic and semi-automatic cognitive processes that are the basis of the higher cognitive functions. However, this is not the dynamic unconscious of Freud, and certainly not the unconscious organizing ego of ego psychology. Using the division suggested by Koch, Freud's and Hartmann's unconscious fits more with the *supramental* one, the unconscious that is busy assimilating new knowledge and experiences, adapting the person to the dynamic social and physical changes in the environment, pushing constantly towards development, efficiency and perfection, and integrating opposed drives, wishes, and defenses while maintaining the cohesiveness of the sense of self. In contrast to the *submental* unconscious, who is conceived as the servant of consciousness, releasing it from the burden of controlling all the operations that do not require the investment of its precious attention and intellectual efforts, the *supramental* unconscious can be conceived as the master and supervisor of consciousness, that protects it from getting too tense, anxious, or overtired, and is always on

guard to prevent it from getting any new information too disturbing to confront, manage, or assimilate.

That new concept – the supramental part of the unconscious - is the best I could find in recent literature to describe the 'factor X' I had in mind. A wise homunculus who serves us as our mind's housekeeper, our coach, our natural healer helping us to confront and overcome mental blows and traumas, driving us for perfection and creation, but as any too loyal butler - sometimes annoying us by pretending to know better than ourselves what is good for us.

Addendum and Summary

The Model

My main effort until now has been to establish 'Factor X' as a legitimate scientific concept, even at the risk of being blamed for bringing the homunculus, and other such specters, back into the language of the exact sciences. But actually, it is not 'Factor X' in general, a concept which includes in fact almost all of the unconscious functions of the mind, that I am interested in, but only one agent among its many components – that of the 'Narrator', the agent which in my view is responsible for the creation of melodies and perhaps of all original ideas. As I am going to dedicate the entire second part of this paper to the description of the Narrator and its supposed functions, let me finish this section by suggesting, as a working hypotheses, a new model of the brain that shows where to place the Narrator among all the other parts and agencies of the brain/mind and better orients us so that we can map the location of the Narrator in relation to the other agents of the brain or mind.

The brain is the focus of interest in many sciences and each divides it into parts, units, centers, layers, modules and the like according to each field's specific requirements. Histology divides the brain into neurons and glia, and each neuron into a nucleus, axon, dendrites, synapses, myelin sheath, and so on. Embryology divides the mind into prosencephalon, telencephalon, diencephalons, and mesencephalon while anatomy divides it into a cerebrum, basal ganglia, medulla oblongata, and cerebellum, and then parts are further divided into lobes and centers. Physiology divides the brain into functional centers like the motor and sensory cortex and visual, auditory, and olfactory receptive areas. Evolutionary biology divides the mind into parts that represent the evolutionary order of their development in mammals and humans, like paleocephalon and the neocortex.

The sciences that approach the brain from its mental aspect, such as cognitive psychology, use to divide it into cognition, affects, volition, and problem solving; Freud suggested two "topographical" divisions – the first, into conscious, pre-conscious and unconscious, and the second, into ego, id, and super-ego.

In recent decades, after all the sciences agreed to look for the site of the mind nowhere other than in the brain, both groups have tried to develop models of the mind that combine organic and mentalistic models and used to formulate them with a slash, as "the brain/mind model" (what Freud already tried to do in his "Project" in 1895).

Norman Holland (2004) has metaphorically described the two groups of scientists researching the brain and mind – the neuroscientists and the humanists – as two groups digging a tunnel from opposite sides of a very large Alp to meet somewhere in the middle: "At any rate, the neuroscientists and we of the human sciences, even if [we] are divided into two groups, share the same hope... to meet in the middle of that huge Alp and there discover this mysterious, magical treasure, Mind" (2004). During the years since Holland wrote this, both groups have energetically continued digging, but are still far away from reaching the meeting point at which they will finally be able to rest, sit down, and together design that ultimate model in the realm of which "mind" will really be identical to "brain". Meanwhile, until we know better, I will allow myself to use recent findings in the brain sciences (most of them presented in the former pages) to suggest a provisional model of the brain/mind.

My suggestion is to divide the brain/mind into what I would call "task forces", – groups of brain centers, modules, nerve circuits and paths, brought together to perform a definite action or function. Let us consider, for example, such actions as walking with a friend on the sidewalk of a crowded street. While being immersed in a lively conversation, you have to navigate your way among the dense crowd while being careful not to bump into somebody who is coming from the opposite direction, or step on the heels of the person ambling slowly just in front of you. Such navigation is actually a very complicated activity: you have to be alert all the time and watch people coming across your path, assess the direction they will take, and accordingly navigate your way in zigzags, being careful not to touch or push anybody. Such successful navigation certainly requires the cooperative activity of many brain systems and functions – perception, processing of information, assessment, problem solving, and decision making (consider only the thousands of instances in which you have to decide on the spot whether to make a right or left turn when somebody is blocking your way). All of this

complicated activity mostly goes on automatically, so that you can continue to converse with your friend without investing conscious attention.

All our behavior is, in fact, controlled, regulated, and monitored by hundreds of such task forces, assemblies of brain centers and circuits each assigned to the performance of a specific behavioral act. Therefore, we could design a new brain model, based not on the histological, anatomical, physiological, evolutionary, or any other conventional division of the brain, but only on the patterns of the brain's organized activities. Let us survey the special characteristics, advantages and disadvantages of such a model:

1) This model, based on the division of the brain and the mind into task-forces, does not overlap any other model or other method of classification and categorization. Let's remember that Freud was the first to realize that an entity as complex as the mind cannot be described with the aid of only one single model, and therefore suggested three models, each scrutinizing the mind (or the "psychic apparatus") from a different point of view – the dynamic, the topographic, and the economic. To this he added, in 1923, a fourth that he called "the second topographic" (later named - the "structural model"). Niels Bohr, who came to a similar conclusion while trying, *in vain*, to organize the basic phenomena of quantum physics into one inclusive model, called this, in 1928, the "*principle of complementarity*".

According to this Freud-Bohr principle, the way you perceive, describe, and assign meaning to a given phenomenon or object is dependent on the specific point of view from which you choose to approach it, and the specific circumstances of inquiry. As Niels Bohr (1934) put it: "From these circumstances follows not only the relative meaning of every concept, or rather of every word, the meaning depending upon our arbitrary choice of view point, but also that we must, in general, be prepared to accept the fact that a complete elucidation of one and the same object may require diverse points of view which defy a unique description." (p. 96),

Applying this principle to psychoanalysis means that the division of the "psychic apparatus" into conscious-subconscious-unconscious, id-ego-superego, and primary-secondary processes does not involve any overlap and, therefore, there is no sense in questions, often asked, like "is the id the territory of the primary processes, and the ego – of the secondary processes?" The division into primary and secondary processes, and ego and id, refer to the same "apparatus" scrutinized from two different points of view.

Applying this principle to the brain sciences means that we have to accept the fact that the complete elucidation of that object called 'brain' requires us to describe and scrutinize it from various points of view and to be prepared for the fact that each point of view can provide only one segment of the required information, while the whole can be attained only by adding the segments one to the other in a complementary manner.

Therefore, the model suggested here does not compete with, nullify, or claim a greater significance than any other model, but only adds one more segment to the complementary chain of knowledge that cannot be attained by using any other model.

2) The basis of this model is behavioral: The specific point of view this model is based on is behavior – how does the brain control the activities of the body and how does it organize its own activities (thinking, imagining, planning, and so on)? I suppose that in the meantime, until the two groups of alpine diggers – the brain scientists and the humanistic and behavioral scientists - meet at the midpoint and agree upon an integrative model, a model based on the point of view of behavior is the best to represent brain/mind in a way that both groups can live with.

The hope of any scientist attempting to construct a psychological model of the mind is to reach the day when the brain sciences will be able to affirm his model and demonstrate the neurological substrata of the until now metaphorical forces, mechanisms, apparatuses, barriers, and the like included in his model. Although the model suggested here is still a mentalistic one, based mainly on what we know about human behavior, and not about brain functions, I believe it will be one of the first to be reified. The great advances in the brain sciences in the last twenty years have mainly been attained as a result of the rapid development of various brain imaging techniques that have enabled us to identify the neural correlates of the mental functions. So, even though we are still far from knowing how the brain manages to solve, for example, a complicated mathematical riddle, we close to know exactly which neurons and neural circuits take part in this activity. Because our present model deals with task-forces, i.e. – metaphorical units of performance – it will certainly be possible in the near future to demonstrate the neural networks involved in the activity of any of the various forces.

3) The general developmental tendency of the brain is to enable each of its hundreds of task forces to act as automatically as possible, to perform their specific tasks without requiring any aid from other forces, like the army of a big empire that trains the units sent to the various provinces and corners of the empire to fulfill each of its duties and solve the problems arising in the course of their activity on their own without bothering the central command. For example – our "Navigator", presented above, usually succeeds in navigating us even through the most crowded streets without requiring our attention, leaving us free to do anything else. Only when involved in an extreme situation, like confronting a group of people blocking the street, or a walker who insists on stepping on your toes, do you have to direct awareness to the act of walking, and consult conscious thought to solve the problem created by the interference.

We see that there is almost no limit to the brain's capacity to train its task-forces to act autonomously, to perform the most complicated activities without involving conscious attention. A well-trained pianist can perform a sonata of Scriabin on stage while at the same time planning how to pay his income tax debts. Most of the brains' essential task-forces also have an outstanding capacity to learn and improve. Consider, for example, our "Navigator" who certainly was never required during millions of years of evolution to steer its owner's movement in velocities exceeding 40-50 Km. per hour (the maximum velocity of a galloping horse). Look how fast he has learned to steer cars and airplanes with only marginal attention, and to control movements exceeding 100 Km. per hour without requiring the investment of conscious effort.

4) We don't know yet whether to consider consciousness one of the differentiated task-forces of the brain, or whether, as Freud thought, to see it as a mental quality. Even Christof Koch, the brain scientist who has devoted his career mainly to the demonstration of the neuronal correlates of consciousness, had to admit in a paper co-written with Giulio Tononi in *Scientific American* in June 2008: "... that at the moment, nobody really knows exactly what consciousness is... We know it arises in the brain, but we don't know how or where in the brain. We don't even know if it requires specialized brain cells (or neurons) or some sort of special circuit arrangement of them". Therefore, if no one can at present tell us exactly what consciousness is, I will continue, for the time being, to stick to the old theories of Freud, Rapaport and George Klein who see consciousness as a cathexes or attention-dispensing

function of the ego system. This theory, although never supported by any neurological evidence, was, and still is, the best for describing clinical findings. Klein (1970) wrote: "In any state of consciousness, awareness is like a light playing on dark waters, subject to disciplinary forces. The light can be bright or dim, sharply focused or diffuse; the experiences it produces can vary qualitatively as images, perceptions, or memories" (p. 246).

From the point of view of this proposed model, consciousness can, in principle, be attached to the activity of any task-force and be deployed over as many facets as necessary for that activity. Consciousness is like a press or TV crew that is free to join any army unit active in the fields and focus its cameras on any and as many targets as it wants. I believe that the reason for the deployment of consciousness is not arbitrary, but, rather, is governed by functional needs. The general tendency of the brain is to train its task-forces to function without requiring attention-cathexis, leaving the limited resources of consciousness to be put to better use. Only when one of these forces faces a problem that exceeds its ability to solve it on its own, is it permitted to call on consciousness for help. Like our "Navigator" who is not aware of most of its activities until it stumbles upon a hurdle, the brain only recruits consciousness when it faces a stumbling block and corrects what has been going wrong, and then, again, forgets it. What exactly the problems consciousness may help with are, or more generally – what the functions of consciousness are – I don't want to speculate on here. We only know that these functions have to be related in some way to reality orientation because the fact is that most of the reality-oriented activities of the brain are conscious while most of the self-centered activities can be executed on the level of the unconscious.

5) The hundreds of task-forces that are activated by the brain are certainly not equal in their significance to the organism, and there are forces that have to be considered as more important, or "higher" and others that are as less important or "lower". But, as we have seen in the former section, none of the accepted criteria used in the other models for ranking the components of the brain into a hierarchy is valid for our model. Almost any task-force includes neurons and centers from all levels and parts of the brain – forebrain, midbrain and basal brain; "archaic" and "neo"; cortex and nuclei - and involves in its activity almost all the known cognitive functions – perception, information processing, decision making, and so on.

The only hierarchical criterion left to rely on is connectivity, i.e. - the extent a given task force is connected to other parts of the brain. Accordingly, to the extent that a task-force

is more competent in perceiving stimuli, sending stimuli, and exchanging information with other brain centers, it has to be regarded as "higher" and more essential to the routine activities of the brain and mind.

6) Let us imagine the brain as the army of a big empire that is constructed as a federation of hundreds of separate task-forces, each assigned to a different task, and each sent to another part of the empire. Each such unit is furnished with all the equipment and arms necessary for acting autonomously, and is trained to solve its problems on its own, while asking for assistance only if absolutely necessary. But this is a very peculiar army because it lacks any central command, and even any headquarters! How such a big organization manages to maintain its unity and integration remains a riddle, and until now there are brain scientists who are still not ready to believe that such a pattern of organization is possible at all, and who continue to search for the hidden command center in or outside the brain.

We know how difficult it is for any big decentralized administration to maintain its unity. Even if all executive units are wholeheartedly devoted to the same common goal, each uses different means to reach that goal, and each is convinced that its own solutions are always the best, a situation that provokes repeated conflicts, contests and rivalries between the various administrative institutions or army units. Freud was the first to show that this situation of permanent conflict, inner struggle, and each part of the "psychic apparatus" trying to force its truth on the others is the norm, and any situation of inner equilibrium and quiescence is created only as the result of a "compromise formation" of the various sides of the perpetual conflict.

This means that inner order is attained not by the authority of a central command, but by developing special forces whose task it is to solve the conflicts created by the various executive task-forces, striving each in its own particular way to achieve a common goal. There are forces whose main task is to reduce tension and anxiety aroused by the inner struggles, to find compromises between conflicting motives, and to maintain the appearance of a unity, coherence, and continuity of the sense of self. As I will try to show in the second part of this paper – the task of the majority of the unconscious functions of the brain, especially the "supra-mental" ones, is to assist the brain in restoring the inner order distorted by the permanent conflicts produced by the routine activity of the various task-forces.

Freud distinguished between three mental qualities - consciousness, pre-consciousness, and unconsciousness. Rapaport, describing these three qualities from the subjective point of view, called them – the noticed, the unnoticed, and the un-noticeable. The advantage of being able to transfer so many mental contents and functions into the pre-conscious is obvious - to spare the limited light of consciousness only for what is the most necessary. But what could the advantage for the brain be in concealing mental contents and functions in the unconscious, i.e. – fostering a group of "consciousness shy" task-forces that are not only able to work efficiently even if left unnoticed, but are also trained to make anything in their power to remain unnoticeable. The neurosciences and cognitive psychology have no reasonable answer, and in fact, most of what they used to call "unconscious" has to be regarded as "pre-conscious" from the point of view of psychoanalysis.

Freud had an answer which may explain the brain's need to keep at least a part of its task forces' activity hidden from the light of consciousness. In his theory almost all task forces included in the obligatory section of the unconscious (the unnoticeable) belong to what he called "defense mechanisms", i.e. – to the organizing functions of the ego whose task is to maintain inner order, unity, integration, self-confidence, a sense of well-being and a feeling that "everything will be OK". But, in his clinical studies, Freud also exposed the many "dirty tricks" the defense mechanisms have to exploit in order to maintain that ideal inner order – censorship of information, distortion of memories, self deception, rationalization and justification of facts and actions known to be wrong. It is therefore understandable why an army lacking an authoritative central command and weak in imposing discipline on its dispersed units, will try to compensate by organizing a strong inner secret police, acting in the dark, as far away as possible from the light of consciousness. Unconsciousness, according to Freud, defends the defense mechanisms.

But I wouldn't go so far with this theory as to explain any obligatory unconsciousness as a need to hide improper defense activities. We have to remember that a considerable part of creative activity belongs to this section of the unconsciousness; the overgeneralization of the defensive theories may lead to one-sided theories that explain creativity as a defensive act. And indeed, there are several psychoanalytically oriented theories that approach creativity only from this point of view, explaining any creation as an attempt at re-creation, motivated by a need to restore a destroyed internalized object, or reconstruct a lost, fragmented, ruined, broken, or crushed internal world.

These defense-oriented explanations of creativity are correct, and can certainly be supported by many case presentations from the history of art and science, but I wonder whether this is really the only explanation for the motivation of an artist or scientist to create something new. For example, what about the creation of the original melodies this study is about – what inner ruins is the unconscious of the composer attempting to restore when singing original melodies while strolling in the forest? We have, of course, good reason to suspect that such an effort to keep something secret, is aimed at concealing some illegal activity, but still – I wouldn't explain unconscious creativity with conspiracy theories alone. Why not admit simply that we do not know. Although we have a reasonable theory to explain why the brain represses many of its contents in the unconscious (traumatic memories, forbidden wishes, etc.) we still don't understand why it has to hide the activity of some of its organizing functions, especially those in which no malicious activity can be detected.

7) The here-suggested model is the most intuitive from a subjective point of view as well, because it fits better than any other model with how we ourselves feel and imagine our brain. We don't feel that our brain is divided into hemispheres, basic nuclei, and other parts, nor that it is composed of different types of nerve cells, but we feel the conflicts and struggles between the various task-forces very clearly. When a friend says "What am I going to do? My head is going to explode..." we know he feels exposed to two or more different forces struggling and screaming inside his head, leaving him powerless to stop them from quarreling.

Also the task-forces which are the basic component of our model are for us not only hypothetical constructs, but something real. Although not felt as physical entities, we are usually aware of their presence and activity inside our head. Even the forces classified as unconscious are unnoticed or unnoticeable are felt only in regard to their mode of activity, in spite that their products, are clearly seen on our inner screen. Like the experience of dreaming – we know that there is somebody sitting behind the wall of our inner cinema projecting the dream we see on the screen. We even more or less know his time schedule, his favorite subjects, and his kinky style of activity. But what we are totally ignorant of are this dream producer's considerations when choosing the subjects of a dream, and how he produces his "film". We are allowed to see what the unconscious task-forces have created, but not to enter their camps or workshops to see how they have achieved it.

The proof of our acquaintances with these non-present presences is our tendency to call them by names and to treat them as something outside ourselves. The child, after breaking a window, will justify himself: "It wasn't me. It was the naughty child inside me who kicked the ball straight into the window"; and the adult may tell you how he planned to do something wrong, but had to stop in the middle "because the voice of conscience didn't allowed me to continue".

Our feeling toward these forces is ambivalent. We are pleased when a complicated activity has become automatic and has become the task of one of these secret forces, like when, after a long period of learning to drive, you finally succeed in transferring the act of driving to an automatic pilot, and are free to speak with a friend on a cell phone while driving. But we are not so pleased when every night the unconscious insists on presenting us with frightening dreams, and are even angry at it when it begins to interfere with our daily activities, causing us to do or say something we have not intended, embarrassing us with provocative interjections, or making us forget something important.

Our main problem with these task forces is one of control. We are very pleased, for example, when we have trained an automatic pilot as a good servant that can be used whenever we want time for our more interesting activities, but on the condition that it can be turned off immediately when we want to activate conscious control. But we have considerable problems with these activities when we have only partial or no control at all (like in dream-work), when those insolent servants, that pretend to know what we really need better, begin to do things without asking for our permission. Most of these secret task-forces are perceived by us as homunculi; we always sense their presence but are unable to reify them. We are familiar with their activities but have no control over them and try to argue with them as if they were reasonable creatures, but we seldom succeed in winning a dispute. In spite of believing that they have no intention of harming us, we treat them with suspicion knowing how capricious and reckless they can be.

There are two professions in which people know these homunculi best – psychoanalysis and the creative arts: the psychoanalyst because he or she is required to learn their language in order to interpret their communications, and the creative artist because he or she is completely dependent on their good will to provide new ideas.

Of all the brain's task forces there is one I am interested in – the Narrator. That is, to my mind, the task-force responsible for the creation and emergence of all the original

melodies, and probably also all original unconscious creative ideas. Accordingly, I will dedicate the second part of this paper exclusively to the study of the Narrator.

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