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Paving the Way for New Research Strategies in Mental Disorders. First part: The recurring crisis of psychiatry

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Psychiatry is going through a deep crisis, both as a scientific discipline as a medical speciality. In the present paper we consider in length what we consider to be the three aspects that could explain the situation: the recurring disappointment in classification; the persistence of dualistic perspectives in research; and third, the continuing of a localizacionism inadequate to explain normal and pathological behaviour.

Psychiatry lacks a definition of mental disorder that covers all situations, there are difficulties in drawing a precise distinction between normality and psychopathology, and the majority of these "diagnostic" categories are not validated by biological criteria. Furthermore, there is still a debate on the nature of the symptoms of mental disorders, a confusion classification and diagnosis and a preoccupation with the growing inflation of diagnostic categories.

Dualism is at the core of psychopathology, simply because Cartesian dualism led to the development of modern science, but the price paid includes the split-up of mental and physical phenomena and illnesses and of psychiatry and the rest of medicine.

Localizationism, that is, the approach to brain function considering that particular pychological functions are carried out by particular brain areas or centers, helps to understand many clinical and psychological phenomena, but have largely fild in explaining the nature of most mental disorders.

In a second part of this article we provide some strategies that could help to go beyond the present impasse

Key words: Classification, DSM-IV, ICD-10, Mental disorders, Dualism, Connectomics, Network medicine

Actas Esp Psiquiatr 2013;41(1):33-43

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Hacia nuevas estrategias de investigación en los trastornos mentales. Primera Parte: La crisis recurrente de la psiquiatría

La psiquiatría está atravesando una profunda crisis como disciplina científica y como especialidad médica. En este artículo analizamos en profundidad los tres aspectos que consideramos que podrían explicar la situación: el recurrente fiasco de la nosología; la persistencia de las perspectivas dualistas en investigación y en tercer lugar, la continuidad de un localizacionismo inadecuado para explicar el comportamiento normal y el patológico.

La psiquiatría carece de una definición de trastorno mental que cubra todas las situaciones, existen dificultades en delinear una distinción precisa entre la normalidad y la psicopatología, y la mayoría de estas categorías "diagnósticas" no están validadas por criterios biológicos.

A continuación consideramos estrategias para superar esta situación poniendo énfasis en la psicopatología en lugar de en la clasificación, en las funciones más que en los criterios diagnósticos, estando atentos en el progreso en las perspectivas neurocientíficas monistas e importando los métodos de la conectómica emergente.

La medicina está cambiando profundamente. La creación de redes se está convirtiendo en el nuevo paradigma y consideramos que podría ser el punto de inflexión de la psiquiatría futura, tanto en la investigación como en la práctica.

Palabras clave: Clasificación, Trastornos mentales, Dualismo, Conectómica, Creación de redes *(Networking)*

INTRODUCTION

Several psychiatrists have extensively written about the crisis of psychiatry, both as scientific discipline as a medical profession. The disarray is as old as psychiatry itself, as we will see latter on, but the crucial points of today's state of affairs can be described as follows:

1. Psychiatry is threatened by either being incorporated in other medical specialities or being deprived of its medical character.[1]
2. There are discussions on whether and how psychiatry will survive into the second half of the 21st century.[2]
3. The growth of pessimism and a sense of foreboding among psychiatrists.[3]
4. Should psychiatry exist?[4]
5. We are being advised by our neurological colleagues to abandon the term "mental illness" and replace it by "brain illness".[5] The negative aspect of this proposal is transforming psychiatry in a branch of neurology, the positive one is to fully integrate both of them in neuroscience.
6. There is increasing decrease of the number of medical students who choose psychiatry as a career.[6,7]

In this context, Katschnig has asked himself: *So, 200 years after its birth, is there something wrong with psychiatry? And, if so, what is it?* and considered the inside and outside challenges to the discipline and the profession.[8] Both challenges are interknitted and the inside ones are closely related to the classification crisis.

The situation is worrying and we will consider it in three sections: 1) The never-ending nosological crisis; 2) The need to prevail over dualism; and 3) The long arm of phrenology. Although the three parts overlap considerably, as could be expected, we consider them separately in the sake of clarity.

In a second article[9] we will propose strategies to confront each one of them and to allow further progress, in order to overcome the long lasting Sisyfication of psychiatry, both as scientific discipline and as a medical speciality.

The never-ending disappointment of psychiatric nosology and classification

Year 1920

> *The method applied so far to define morbid forms, taking into account the cause, manifestations, evolution and the final stage, and postmortem findings, is exhausted and is no longer satisfactory, new ways must be sought.* (Emil Kraepelin[10]).

Year 2002

> *Nearly three decades after Robins and Guze's seminal delineation of the steps required to validate a psychiatric diagnosis, a pathophysiologically based classification of psychiatric disorders remains elusive.*
>
> *Contrary to optimistic expectations, approaches to diagnostic validity based on clinical description, laboratory studies, natural history of illness, and familial aggregation have not converged to yield a nosology based on valid disease entities.*
>
> *Defining a rational nosology for disorders of the brain, the body's most complex organ, is clearly one of the great challenges for modern medical science.* (Steve Hyman[11]).

The great hope that DSM-5 could bring fundamental advances in our understanding of the genetic and environmental determinants of disease risk, and of the neural circuity supporting normal and pathological mental processes has not materialize in spite of extensive and intensive research efforts.

Furthermore, the problem as stood today may have no solution:

> *Even if the pursuit of methodological purity is abandoned, the two broad approaches to the classification problem currently available –on the one hand the more numerical, and on the other the more categorical- fail. They are doomed to failure because of the nature of the data they attempt to classify.*
>
> *On top of all other problems, the former (numerical) methods fail because the characteristics of psychiatric diseased are not easily measured, and the latter (boxing) fall down because of the conspicuous overlap between adjacent categories.* (Parshall and Priest[12]).

Following we will consider the relevant areas where this disappointment is present together with the causes and consequences of the present situation. Among them are: The definition and boundaries of mental illness, the nature of the symptoms of mental disorders, to classify is not to diagnose, the lack of a coherent theoretical basis, the scarcity of neurobiologic markers and endophenotypes and the negative impact in clinical practice.

The definition and boundaries of mental illness

Disease categories and their classification are the pervasive organizing principle for most fields of medicine. Diagnoses are meant to be used for making therapeutic decisions, for teaching purposes, for defining patient populations for research, for statistics and for reimbursement.

Psychiatry considers itself a medical specialty that aims to move in this narrow medical model as already defined a century and a half ago by Karl L. Kahlbaum[13]:

> *There is a correlation between the etiology, cerebral pathology, symptom patterns and final stages, linking seemingly disparate clinical disease.*

Psychiatry is dealing with mental disorders and both terms, mental and disorders, are problematic.

Psychiatric diagnostic categories are referred to as 'disorders', they are presented as medical diseases, but are not validated in the same way as most medical diagnoses:

> *The term "disorder" is used throughout the classification, so as to avoid even greater problems inherent in the use of terms such as "disease" and "illness". "Disorder" is not an exact term, but it is used here to imply the existence of a clinically recognizable set of symptoms or behavior associated in most cases with distress and with interference with personal functions. Social deviance or conflict alone, without personal dysfunction, should not be included in mental disorder as defined here.*[14]

"Psychiatric disorder" has been proposed as an alternative name, as it emphasizes that these conditions are not purely "mental", and that the line between "psychiatric disorder" and "other medical disorders" is not a sharp one. However, the term "psychiatric" has been criticized for not sufficiently connoting the extent to which entities are in fact psychobiological (instead, for some, connoting an overly reductionist biomedical model). Mental health clinicians other than psychiatrists have also voiced criticism of this term insofar as it may suggest incorrectly that only psychiatrists are trained in the diagnosis and management of these conditions.[15] For us the real problem with the term psychiatric disorders is that it establishes an indissoluble union of a set of diseases and a medical specialty, something that we consider inappropriate with recent developments in medicine.

In DSM-IV[16], each of the mental disorders is conceptualized as

> *A clinically significant behavioural or psychological syndrome or pattern that occurs in an individual and that is associated with present distress (e.g., a painful symptom) or disability (i.e., impairment in one or more important areas of functioning) or with a significantly increased risk of suffering death, pain, disability, or an important loss of freedom. In addition, this syndrome or pattern must not be merely an expectable and culturally sanctioned response to a particular event, for example, the death of a loved one. Whatever its original causes, it must currently be considered a manifestation of a behavioural, psychological, or biological dysfunction in the individual.*

Both DSM-III and DSM-IV emphasized the difficulties inherent in drawing a precise distinction between normality and psychopathology, and they provided a definition of mental disorder that attempted to address this challenge. No definition adequately specifies precise boundaries for the concept of "mental disorder".[17] This issue is relevant not only to deciding whether or not a disorder should be in the nosology, but whether or not the criteria for a particular disorder are optimal for defining the threshold for caseness. DSM-IV[18] remarks that:

> *"... although this manual provides a classification of mental disorders, it must be admitted that no definition adequately specifies precise boundaries for the concept of 'mental disorder.' The concept of mental disorder, like many other concepts in medicine and science, lacks a consistent operational definition that covers all situations. All medical conditions are defined on various levels of abstraction, for example, structural pathology (e.g., ulcerative colitis), symptom presentation (e.g., migraine), deviance from a physiological norm (e.g., hypertension), and etiology (e.g., pneumococcal pneumonia). Mental disorders have also been defined by a variety of concepts (e.g., distress, dyscontrol, disadvantage, disability, inflexibility, irrationality, syndromal pattern, etiology, and statistical deviation). Each is a useful indicator for a mental disorder, but none is equivalent to the concept, and different situations call for different definitions."*

The symptoms of mental disorders

K. Schneider[19] has made a sharp criticism on the concept of symptom in psychiatry, showing, again, the deep crisis of psychopathology.

In medicine symptoms are signs of an illness, an understandable hint of an illness. Therefore, signs indicate the likelihood of the presence of a certain illness. This concept applies in psychiatry only in the case of the somatically based psychoses. Dementia is the consequence of abnormalities of brain functioning. The former, dementia, is a "symptom" of the latter, the abnormality. The same principle applies to confusional states, where the physician should consider an acute (or if in the context of a chronic disorder, an episodic) direct or indirect brain damage or malfunction. Both, dementia and confusional states, are "symptomatic psychosis" in the stricter medical terminology.

And in the rest? First, we can easily accept that in the variations of the mode of being, anxiety and personality disorders in today's terminology, symptoms are the extremes of traits conceived as dimensions. So, the presence of a score

deviated for a certain number of standard deviations above or below a mean, lead to the conclusion that the subject's behaviour is the consequence of the presence of such or such disorder.

Second, in endogenous psychoses, K. Schneider goes on, the concept of symptom is stretched to include postulated yet indemonstrable illnesses and therefore that delusion, for example, is a symptom of schizophrenia. But such a stretch is methodologically unacceptable and therefore, "symptom" should be understood as a characteristic constant feature of a purely psychopathological nature that can be articulated in an existing state with a subsequent course. In this case the medical connotation of "symptom" is abandoned. A psychopathologic structure consisting of a "state" and "course" is not an illness which can produce symptoms.

On the other hand, Hofer[20], Tellenbach[21] and others have claim that the referred manifestations of endogenous psychosis should be considered not as symptoms but as phenomena. Let's clarify what this means.

In his *Critique of Pure Reason*, Kant distinguished between "phenomena", and "noumena". The first are the objects as interpreted by human sensibility and understanding, while the second are things-in-themselves which humans cannot directly experience. From then on phenomena in it broader sense were described as contents of consciousness without asking what connection to an external reality those experiences might have. In its most basic form, phenomenology thus attempts to create conditions for the objective study of topics usually regarded as subjective: consciousness and the content of conscious experiences such as judgments, perceptions, and emotions. Phenomenology seeks through systematic reflection to determine the essential properties and structures of experience avoiding the analytic approach of neurology, clinical psychology or present day psychiatry. An important element of phenomenology that Husserl, the initiator of this new perspective of philosophy, is intentionality, also called as "aboutness", which means that consciousness is always consciousness of something, about something.

Phenomena are not to be understood in an analytical way, nor should they be submitted to the principles of natural sciences. They have to be grasped in a comprehensible way, holistically or as a gestalt. We will come back to it latter on while considering some relevant aspects of schizophrenia.

On the other hand and coming back to the symptoms of mental disorders two further point should be considered. For K. Schneider[19] delusional notion has less diagnostic significance (second rank symptom), because there is no perceived object, only an intuition. But, the descriptions of John Nash[22] on his delusional intuition also lead to the conclusion that they are not specific of the psychopathology of schizophrenia. In his own words:

> *The ideas I had about supernatural beings came to me the same way that my mathematical ideas did. So I took them seriously.*

Such an important manifestations as delusion cannot be considered as specific for anything. According to Hillman[23], the process of thought in delusion is not different from the normal process of thinking. The delusional individual builds his world and fills it with meanings the same way as the ordinary person does. The difference is in the individual who is delusional. In a similar way, for Ey[24] the hallucinations do not exist, what exists is the person hallucinating. The study of the creativity of artists with schizophrenia leads to the same conclusions: the difference is in the attitude of the author to his/her work.[25]

Dysfunctions vs symptoms. An adaptive perspective

DSM-IV refers to behavioural, psychological or biological dysfunction. The term dysfunction can be understood in a statistical way, meaning deviance from a statistical norm,[26] or in an evolutionary framework, meaning deviance from functioning as selected for[27]. Both of these so-called naturalist approaches are controversial in various ways.[28]

There is a need to include evolutionary theory in the knowledge on normal and abnormal human development and psychopathology.[29] One problem with the evolutionary theoretic approach to defining disorder, for example, is that it would involve speculative theoretical assumptions about what syndromes did or did not represent a failure of evolutionary selected psychological or behavioural mechanisms, which would adversely affect reliability of diagnosis.

Adaptations are behavioural and psychological mechanisms present through evolution to serve specific purposes relating ultimately reproductive success. Although[38] adaptations are inherently functional, in some cases their operation however can cause personal and social dysfunction. The main three of dysfunction are: a) the existence of adaptive trade-offs, b) mismatches between ancestral and current environments and c) individual differences.[30]

There are a few mental disorders which have been considered being the consequence of an adaptive process which had been successful in Palaeolithic epoch. Nowadays changes in environment and human adaptation, the characteristic considered may not be present anymore or the attribute may not be any more adaptive. Among them: Social anxiety,[30,31] depression and anxiety,[32] dysthymia,[33] attention deficit hyperactivity disorder (ADHD)[34,35] affective[36] and emotional[37] disorders in general, schizophrenia[38] and obsessive-compulsive disorder[39].

Sometimes it is not the disorder itself, personality traits associated to it[40], or some underlying physiological[41,42] or genetic[43] mechanism which is adaptive and may have gone astray.

We agree with Spitzer[44] in the belief that the adoption of the harmful dysfunction analysis diagnosis would have little if any effect on the list of categories of mental disorders. Its main value would be in helping make revisions in the diagnostic criteria more valid as true indicators of disorder.

An alternative way of understanding "dysfunction" is in terms of the consequences of the syndrome, specifically distress and disability. It has been argued that the notion of "dysfunction" draws on particular metaphors of disorder and that there is no algorithm that specifies fully the use of the term, rather appropriate use requires careful judgment.[45]

Context is a key issue in determining whether disorder is present.[46] For instance, antisocial behaviour in adolescent gangs in some urban areas may be adaptive within the gang, but may fulfil diagnostic criteria for conduct disorder, or lead to legal problems that put the individual in jail. Therefore, the symptoms should be closely examined and appraised against the patient's life values and goals.[47]

A key aspect of context is the developmental stage of the individual; the boundaries between function and dysfunction change over time.

It has been recommended that the requirement of impairment should be removed from all diagnoses.[48] Less drastic proposals include a new term to replace "dysfunction" such as "disturbance",[49] because it is not associated with particular theories of function, and is used in some diagnostic criteria sets. This would not, however, resolve the difficulties involved in specifying appropriate use of the term.

To classify is not to diagnose

Classification and diagnosis should not be confounded, nor criteria and symptoms. DSM-IV and ICD-10 are purportedly atheoretical and largely descriptive. Although this achieves good reliability, the validity of a medical diagnosis is greatly enhanced by an etiological approach.

Several authors have described the history of psychiatric nosology as a succesion of stages, leading each time to models more scientific and more relevant for clinical practice. In our opinion, this is not the case. Psychiatric nosology for the last two hundred years has been revolving around a set of models, coming back once and again to each one of them and been able neither to overcome nor to consolidate none of them. Ban[50] has described them in a chronological order: 1) syndrome based (i.e. Falret[51]); 2) disease oriented (Kahlbaum[13], Kraepelin[52]) and 3) pattern-based (i.e. Leonhard[53]).

The categorical approach goes back to Plato and in psychiatry is represented by Hoche[54] who described the *Grundsymptomen* (basic symptoms) of psychiatric disorders. A strictly categorical system is problematic in research and in practice. When thoroughly applied, problems arise: comorbidity, heterogeneity with respect to key clinical features, such as severity and prognosis, and below diagnostic thresholds patients.

The constraints of categorical definitions of mental illness has led to consider continuous, dimensional measures into the various diagnostic domains, as notably DSM-5 will do.

The spurious dichotomy between categorical and dimensional approaches to diagnosis and classification; and the distinction between validity and pragmatic utility has led to the conclusion that both approaches to diagnosis should be combined.[48]

The DSM-III approach of creating "operational definitions" has certainly rendered the process of arriving at a diagnosis more reliable, in the sense that we can be surer that, if different psychiatrists assess a patient diagnostically, they will, after evaluating symptoms and other criteria, come more often to the same result. But reliability is different from validity. Psychopathological phenomena certainly exist and can be observed and experienced as such. However, psychiatric diagnoses are arbitrarily defined and do not exist in the same sense as psychopathological phenomena do.

The definitions of most psychiatric diagnoses consist of combinations of criteria of presence, combined by expert committees in variable ways into categories of mental disorders, which have been defined and redefined again and again over the last half century. A diagnostic criterion is not a symptom as we have already discussed. The majority of these diagnostic categories are not validated by biological criteria, as most medical diseases are; however, although they are called "disorders", they look like medical diagnoses and pretend to represent medical diseases. In fact, they are embedded in top-down classifications, comparable to the early botanic classifications of plants in the 17th and 18th centuries, when experts decided a priori about which classification criterion to use, for instance, whether fruiting bodies or the shape of leaves were the essential criterion for classifying plants. All kinds of rescue efforts are under way in relation to these threats to the diagnostic knowledge base of psychiatry, and a plethora of suggestions are being made: to identify "metastructures", to supplement diagnostic categories with dimensional measures or a "cross-diagnostic approach" or to use "epistemic iteration" . The situation is so disappointing that a group of psychiatrists has asked for the establishment of a conceptual working group for DSM-5, pointing out that in past DSM revisions conceptual

questions were considered only on an ad-hoc basis by individual workgroups and the task force.

The threatening bottom line of these discussions is that, if our diagnostic categories have not been valid until now, then research of any type –epidemiological, etiological, pathogenetic, therapeutic, biological, psychological or social– if carried out with these diagnoses as inclusion criterion, is equally invalid. For instance, limited changes in diagnostic criteria of bipolar disorder can increase the prevalence of bipolar disorder from 1% to up to 5% of general the population.[55]

Lack of a coherent theoretical basis

Psychiatrists are perceived to be Babelic profession, and indeed we are. There is plentiful of "psychiatries", opposed to each other, fighting among themselves for a leadership in conflicting models and roles. There is a full variety of choices including biological psychiatry, psychoanalysis and psychodynamic psychiatry, social psychiatry, community psychiatry, family psychiatry, forensic psychiatry, military psychiatry, children and old age psychiatry and recently women's mental health and men's mental health too. Psychological disciplines should be added in order to materialize an indecipherable uproar. Each approach has its own body of knowledge, conferences and journals. Some psychiatrists have embraced the biological model, some still clung to the Freudian model, and a few see mental illness as an essentially sane response to an insane world.[56] The tone with each other is getting increasingly irritated,[57-61] and so came up with completely different ideas[62].

For Jablensky[63], the multidimensional approach is indicated by the observation of Kraepelin on the functional psychoses, but as 1) as we cannot distinguish satisfactorily between schizophrenia and manic-depressive disorder we must suspect that our formulation of the problem is incorrect; 2) schizophrenia and manic-depressive disorder may actually represent general human psychological problems operating in combination with pathological changes and are thus only two among many possible "registers" of psychopathology and 3) the symptoms of schizophrenia are not unique to this disease, and may be continuous with normal psychological symptoms.

It is no surprise that different systems provide different epidemiological data. DSM-IV dementia occurred most frequently (9.6%), followed by dementia according to "historical" criteria (7.4%), DSM-III-R (6.3%), ICD-10 (3.1%), and ICD-9 (1.2%). The kappa values for the agreement between the diagnostic systems were between 0.166 and 0.810.[64]

The scarcity of neurobiologic markers and endophenotypes

There are no unequivocal physical markers for psychiatric illness. What are symptoms and what is illness have come to be determined by a checklist in DSM IV TR and ICD-10.[1] In the sake of manifest more discrepancies some researchers argue that classification will only be reliable and valid when based on neurobiological features rather than clinical interview, while others suggest that the differing ideological and practical perspectives need to be better integrated.[8]

There is virtually no one useful to allow the diagnosis of a major psychiatric disorder, predict a response to a treatment, there is an overlap between diagnostic groups and controls and there are few susceptibility genes useful in predicting the risk for a disorder.

The fairly small reproducibility of results from etiological research, the complex relationships between genes and behaviour and the fact that current diagnostic systems have complicated research rather than simplifying it, has led to an endophenotype. An endophenotype is a quantifiable missing link between genes and clinical manifestations. Endophenotypes are measurable components unseen by the unaided eye along the pathway between disease and distal genotype, have emerged as an important concept in the study of complex neuropsychiatric diseases.[67,68] Endophenotypes can be neurophysiological, biochemical, endocrine, neuroanatomical, cognitive or neuropsychological. Endophenotypes represent simpler clues to genetic underpinnings than the disease syndrome itself, promoting the view that psychiatric diagnoses can be decomposed or deconstructed, which can result in more straightforward- and successful-genetic analysis. They characterize an approach that reduces the complexity of symptoms and multifaceted behaviours.

Heritability and stability are key components of any useful endophenotype. Endophenotypes for psychiatric disorders must meet certain criteria, including association with a candidate gene or gene region, heritability that is inferred from relative risk for the disorder in relatives, and disease association parameters.[67]

Endophenotypes don't need to be hereditable (i.e., the possible influence of in utero viral infections for schizophrenia).[68]

Nevertheless some authors have expressed concern about limitations in the usefulness of the concept of endophenotype.[69]

Genetic analyses have concentrated on discrete phenotypes supposedly linked to a particular psychiatric disorder by common neurobiological pathways, instead of

studying the complex disease itself. Several endophenotypes have been established for psychiatric diseases including electrophysiological abnormalities and alterations in structural and functional brain imaging. Although results seem to be getting more consistent and reliable, several concerns have also emerged with the experience gained on the topic.

The real challenge if we want to understand what is all about in mental diseases is to look for comprehensible endophenotypes, manifested themselves in the domains of psychological functions and neurobiological findings, including genetic ones.

The negative impact in clinical practice

Criticism of psychiatric diagnostic classification systems and disease definitions is growing among mental health staff,[70] with comments on "genetic deconstruction of psychosis",[71] the lack of validity of psychiatric diagnoses despite their utility,[72] and the poor diagnostic stability of psychiatric disorders. From psychiatric geneticists one hears that they have to use "star war technology on bow and arrow diagnosis" or that "it has been suggested that the debate is political. This is not the case however, as solid scientific evidence pointing to the absence of nosological validity of diagnostic categories that nevertheless invariably are subject to paradoxical psychiatric reification, lies at the heart of the argument".[73]

Several other issues are waiting for clarification, such as: comorbidity[74] which is an inevitable methodological consequence of the diagnostic strategies and continued diversification of DSM-IV and ICD-10[75]; "Not Otherwise Specified" (NOS) categories, which in some instances it is the most common category in outpatient settings[75] and in eating disorders reaches up to 60%[76]; subthreshold affective, psychotic, anxiety, cognitive and substance abuse and other psychiatric disorders contribute to psychiatric morbidity, suffering and impairment of the patients[77,78] and the key issue is whether subthreshold conditions escalate or predict the onset of full syndrome disorders over time. Equally important, though, is whether subthreshold conditions are likely to develop other full syndrome disorders and whether these associations are maintained after adjusting for comorbidity; the inflation of diagnostic categories (nosologomania[79]) and it has been suggested that the categories should be reduced from 17 to one half to one third[80]. Nowhere in the rest of medicine there are such different perspectives as the ones of the so called splitters and lumpers. The first group is represented by the concept of unique-psychosis (*Einheitspsychose*), and authors like Griesinger[81] and Janzarik[82]. In Spain, Llopis[83] studied the psychiatric disorders secondary to pellagra after the 1936-39 Spanish Civil War, and described how, depending of the severity and time of duration of the vitamin deficiency, the same patient could undergo through all of the different psychiatric nosological entities, from neurasthenic disturbances to irreversible dementia. The opposite extreme is represented by Boisser de Sauvages, physician and botanist, contemporary of Linneus who in his *Nosologie méthodique, dans laquelle les maladies sont rangées par classes, suivant le système de Sydenham, et l'ordre des botanistes* proposed 2,400 different classes of mental disorders.[84]

DUALISM ONCE AND AGAIN

Dualism considers that there are two substances in us, one that distinguishes us from other beings and from the rest of the individuals of the human species, the soul, the psychic life, mind or consciousness, and another, the body. The aim of the first substance is to dominate the body, to survive it after death when, already a corpse bound to putrescence, is buried, incinerated or thrown to the depth of the sea. This dualism aims to explain the origin of the evil and the attitude to defeat it and it does so efficiently. Dualism has very ancient roots (the Upanishads, in the orphic texts, Plato), it is the core of Gnostic thought and the foundation of the modern science since Descartes. We also warn about the fact that some monist perspectives are masked dualisms.[85]

Dualism manifests itself in the separation of mental and physical diseases, of psychiatry and the rest of medicine, of neuroses and psychosis, of biological research and interventions from other psychosocial approaches and in the proliferation of psychiatric sub-disciplines.

Therefore, from this perspective:

> *Mental illness normally is a chronic brain affection without fever, characterized by disorders of the sensitivity, of the understanding and the will.*
>
> *I say normally because sometimes the illness is of short duration and because in the beginning or during its course there may appear feverish symptoms.* (Esquirol[86]).

Even psychoanalysis engages itself in this search for "the organ". For Freud[87] consciousness is None other than that of a sensory organ for the perception of psychic qualities.

But of course the history of hysteria and hypochondriasis along many centuries show that physicians considered them to be different to the rest of disease, considering the presence of what we would call today a psychological origin. The incorporation of this second realm into psychiatry is clearly expressed in the following paragraphs from Griesinger, which, by the way, the thousands quote of the

first sentence of the paragraph (*mental disorders are brain disorders*) is the typical abuse of citations not consulted.

> *Mental medicine has to be cultivated like a branch of the pathology of the brain and the nervous system in general and has to apply serious diagnostic methods used in all branches of medicine. In order to become a good alienist one has to know in depth, before anything, the whole of general medicine and specially the illnesses of the nervous system.*
>
> *Besides this purely medical element, mental medicine is provided with another essential element which grants this art of healing with an own and special character; it is the psychological study of the aberrations of intelligence observed in mental illnesses. Physiological psychology, a pure science of observation, that makes us recognize in the sane or morbid psychic functions the same order of facts (...), these two elements that, I repeat, have the same importance for psychiatry.* (Griesinger[88]).

We want to emphasize that Griesinger wrote about the two elements of psychiatry as a medical discipline. What happened afterwards is that the two elements separated in two methods (the Jaspers' comprehension – explanation[89]) and two categories of illnesses (the K. Schneider's variations of the mode of being – psychosis[19]). And those were the two big leaps were psychiatry since then has being living. Not comfortably, anymore as we are seeing. One of the most mysterious paragraphs in the whole psychiatric literature is the following comment by K. Schneider on a third element metagenesis!:

> *In addition to somatogenesis and psychogenesis, there is a third theoretical possibility: namely, metagenesis, that is, some genuine "aberration" of the mind, without somatic or psychic foundation, and this, at any rate here and perhaps elsewhere, will have to remain an open question.*[19]

The word "aberration" translates the German *verirren* ('gone astray'), which in the original German is written *verr"irr"en* because *irren* means being wrong, losing the mind.

According to Dörr[90] the misconception of the concept of symptoms gone through above is a consequence of dualism. On the one side, mental disorders are conceived a brain disorders and. The Cartesian anthropology, with its absolute separation between the *res extensa* and *res cogitans* discards the possibility of their alienation and thought that a man could only mentally sick if his brain was altered somehow.

On the other hand, psychoanalysis and depth psychology delve into the mechanisms that are present in mental diseases looking for dynamic connections, regions or instances of the psychic subjected to regulatory energy principles. In this dynamic game evolving lurks the possibility of failure, the disturbance of "psychic balance" in the confrontation with the world and with each other. A new balance achieved on the basis of "commitments" and "concessions" between different instances will be the origin of the neurotic symptoms.

As we see, in the two kinds of psychiatry, the one which follows the medical paradigm and the dynamic one, the symptom or trait is an invisible process element external, visible, and the diagnosis consists in establishing the connection between them and underlying entity. But it happens that this diagnostic procedure is based on two assumption that are not met in the majority of psychic disturbances, with the exception of the brain organic ones, as we have already commented on.

This concept of symptom of has the serious drawback of falling into permanent tautologies.[91] Then, not knowing the basal disease and links that link to the symptom, psychiatrist must diagnose, v. gr., a schizophrenia "schizophrenic symptoms character" and not by the mere presence of one or several of them, as it is the case with any other disease.

LOCALIZATIONISM: THE LONG ARM OF PHRENOLOGY

Modern scientific medicine is initiated by the book of Giovanni Battista Morgagni *Sedibus et causis morborum per anatomen indagatio* (1756). Since then on the seat of mental illness and hence mental activity is the brain, and that is where we had to find their causes. However, the brain is very complex, mental illness very diverse and mental activity endless brought to the conclusion that the brain should be studied as a set of organelles each one with a different function. Thus was born phrenology and paving the way to the so called brain mythology.

A phrenological approach still survives in neurological and psychiatric research, not only in them. According to this doctrine, brain nuclei and psychological functions are associated with more or less defined and specific mental symptoms or diseases. This approach has been extended to the neuropharmacology attributing specific neurotransmitters psychological functions, such as attention and motivation to dopamine, concentration to norepinephrine or anxiety and obsessiveness to serotonin. On the other hand, often psychological functions and their respective psychopathology are defined arbitrarily (as in his time did phrenology).

The temptation to assign functions to brain areas is not easy to reject and constantly appear attractive publications with titles such as: the musical brain,[92] the emotional brain,[93] moral brain,[94] social brain, blue brain, brain pink,[95] ethical brain,[96] male brain, female brain, etc., capable of deciding, loving, attacking, or simply being moved.

Anyone understands that it is not possible to declare that the stomach is an organ that when it is hungry, attempts to feed itself. He who feels hungry and feeds himself is an individual who, by doing this, is also providing nutrients to the gastric walls and undoubtedly, without them, would be not as good nourished. In the same way, we can assert that the brain neither thinks nor reasons, nor does it have a conscience, nor does it suffer. It is not moved and has no feelings, it does not love or pray, it does not see or listen, it is mute, it lacks sexual inclinations of any sort, it has no an own life style and identity and it does not take part in a social group. None of these expressions can be applied to the brain. They belong to the subject who, we underline, cannot perform or any other action, without one's own body, from which the brain, cells, and connections form a part and which are maintained alive by the remaining organs. Consequently, expressions as that such neuronal group decides, remembers, sees or listens should be ruled out forever. He who makes decisions, remembers and is the subject, a person.

The mixing up *pars pro toto* is a mereological fallacy.[97] The mereology, from ancient Greek *meros* 'part,' is the study of the relationships among parts and with the whole.[98] A mereology fallacy occurs due to believing that the brain, which is a part of the human body, is responsible for the mental activity, when it results that the psychological predicates can only be applicable to the human beings (or other animals) as a whole, and therefore, they cannot be applied intelligibly to any of its parts, not even the brain. The alternative, according to Bennett and Hacker,[97] is that the attribution of the psychological predicates to the brain is in first place a philosophic and not a neurological matter, since it is a conceptual question. Therefore, the brain is not the appropriate subject for the psychological predicates.

CONCLUSIONS

We have gone through a recurrent crisis of psychiatry around three main features: classification, dualism and localizationism. Of course, there are other elements that could have been considered, but the three chosen seem to us quite nuclear and help to envisage future strategies in psychopathology and neuroscience in general.

On the other hand we have to emphasize that the solution of the present situation is not to look for new foundations as the crisis is the consequence of the progress brought by modernism. Modern science is a consequence of Cartesian dualism, modern scientific medicine is the consequence of the great advancements of the anatomical research of Vesalius, Bonset, Morgagni and several others. Modern science and modern medicine are, no doubt, the greatest achievements of humankind having change for the better of millions of human beings. We are not arguing to throw the baby with the water in the tub, but to look for fresh water to replace or replenish the existing one. This we will do in the second part of this article.[9]

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