What are disasters and catastrophes?

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¿Qué son desastres y catástrofes?

Summary

Psychiatric reactions to disasters have not received sufficient attention because it is widely accepted that human beings can endure any kind of extreme stress.

A disaster is the consequence of an extraordinary event that destroys goods, kills people, produces physical or psychological harm but, above all, which overcomes the adaptive possibilities of the social group. Disasters have strong political background and consequences. They shake the life of a community and bear with them a set of questions about safety, social organization and meaning of life.

Reactions to stress occur in stages, each one characterised by a specific psychological mechanism: pre-impact, alarm, impact, recoil, post-impact and reconciliation.

Symptoms include flashbacks, difficulties in remembering, avoidance of stimuli, blunting of responses, high arousal level and obsessive ruminations.

Biological, psycological and social factors participate in the pathogeny of these clinical pictures.

Key words: *Disaster. Catastrophe. Stress.*

Resumen

Las reacciones psicológicas ante situaciones catastróficas han recibido poca atención porque suele considerarse que el ser humano es capaz de afrontar todas las calamidades a pesar de que en ocasiones individuos concretos puedan sucumbir por una debilidad o falta de recursos personales.

Una catástrofe es consecuencia de un acontecimiento extraordinario que destruye bienes materiales, siega vidas humanas o produce lesiones físicas y sufrimiento, pero sobre todo que desborda la capacidad de adaptación del grupo social. Los desastres tienen un trasfondo político y también consecuencias políticas. Conmueven los cimientos de un grupo social y plantean preguntas sobre la seguridad, el significado de la acción social y el sentido de la existencia.

Las reacciones al estrés se desarrollan en etapas, cada una de ellas caracterizada por un mecanismo psicológico: preimpacto, alarma, impacto, retroceso, postimpacto y reconciliación.

Los síntomas de éste incluyen reviviscencias, dificultades de la evocación, evitación de estímulos, entumecimiento de las respuestas, un nivel de elevado de activación vegetativa y rumiaciones obsesivas.

En la patogenia de estos cuadros intervienen factores biológicos, psicológicos y sociales.

Palabras clave: *Desastre. Catástrofe. Estrés.*

INTRODUCTION

The psychological reactions to disasters have not received until recent times all the attention they deserve. Although it is true that there are excellent descriptions, and some of them very old, like the one by Pliny the Young of the eruption of the Vesuvius that destroyed Pompeii and Herculanus in the year 79[1] or the one by Voltaire[2] of the earthquake that devastated Lisbon in 1755. In fact, it may be possible that the oldest text found in the Iberian Peninsula, the Great Bronze Plaque of Botorrita* could be the description of a disaster occurred before the year 70 BC.

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* This is a text in Celtiberian language written in Iberian characters. Its translation, not accepted by all experts, by Alonso[3] describes the overflowing of the Huerva river in the following way: a inundation coming from the close mountains flows all possible water in a stream of stony sand that debauches in Contrebia. In that moment the mixture of water and mud coming from the river tracks destroys the riverbanks. The disaster covers all the streets with sand, the water overflows since the sinks could not cope with more. It seemed the people were getting crazy, while the water continues to pour down enraged, tearing the deaths away from their graves, dragging them along. Human buzzards, the plunderers, are ambushing to see if they can make and profit from the tragedy, although knowing that their acts may be punished with severe penalties, even with quartering. The strong flow drags along those who have not been able to protect themselves, disappearing in the uncontrollable death flow. According to what the people from Contrebia rumoured, they have to pledge for grace for those who died in the flooding, turned into ghosts coming from deepest inferno (the most frightful place), carrying candles in their hands since the authorities did not offer adequate funerals for them.

Once the flood ceases, a messenger from the authorities inspects the damages caused to the facilities located at the riverbanks, as well as the great Lord (maybe a nobleman with military authority). It's not true that the Contrebia tragedy happened because of lack of available sinks. When the local authorities of Contrebia knew that the uncontrollable flooding was imminent, they gave public notice to the neighbours and ordered evacuation. It is therefore false that the blame was to be ascribed to the fraternity of the Lands of Contrebia. This is our testimony.

Only in 1948 disaster ractions were recognised International Classification of Diseases (ICD-6;)[4] and in the Diagnostic and Statistical Manual of the American Psychiatric Association[5] they do not appear until 1980 (DSM-III)[6]. Furthermore the descriptions and criteria are very unsatisfactory in both classification systems which, on the other hand, are very different from each other (WHO, 1992)[7].

There are several reasons for this uneasy situation, which are worth to be analysed. The first one is to consider that it belongs to human nature to be able to face up to all calamities, independently from the fact that occasionally some individuals could yield, due to a lack of personal strength. The other one is to accept that the personality is stable and does not change along lifetime, not even after experiencing extreme situations. Concentration camps of Nationalsocialist Germany changed these views: tolerance has limits, there are situations in front of which any individual would succumb. This is linked to the fact that there is also an absolute evil, as described by Hanna Arendt[8]. The experience in communist concentration camps showed how the combination of physical dearth, isolation and psychological humiliation shatter the most solid defences. The studies of concentration camp survivors lead Venzlaff (1958)[9] and later on von Baeyer et al. (1964)[10], to describe for the first time persistent transformations of the personality.

Therefore, until then, the emphasis of education was laid on the strengthening of the individual. Since then, the idea of creating the most favourable social conditions which allow to avoid such limit situations and which commit everybody in this task, has grown each time more and more.

A third reason for the relative little interest for this subject, is that it has mainly been studied by military psychiatrists, who usually have many difficulties when it comes to publish and share their experiences with other colleagues, as they may well be on the opposing side in a war or confrontation. This is also changing. A few years ago, at the end of the Cold War, I suggested that the Section on Military Psychiatry of the World Psychiatric Association change its name to the one of Military and Disaster Psychiatry. The change reflects the greater collaboration between the civil and the military world and allows transferring to civil disasters the great experience accumulated during military conflicts.

Research in disasters is very difficult, because it is hard to integrate it in the rescue tasks which have priority and because it usually recalls negative reactions from side of the victims. Investigation is therefore opportunistic and after-the-event[11]. Furthermore, the involvement of psychiatrists in the rescue and care of victims is usually late and often because of secondary reasons for instance, in case of court litigation. This also reduces the opportunities for research[12]. On the other hand, reactions to the most different disasters are extraordinarily similar. This allows accumulating and sharing experiences, creating groups of experts and preparing plans and intervention groups. Already in 1996 the World Psychiatric Association approved an initiative in this sense which is being developed by a Task Force chaired by George Christodoulou and by myself.

My personal experience in this field starts with a series of reports I carried out for survivors of nazi concentration camps, which had requested compensations in accordance to the *Bundesentschädigungsgesetz* (Federal Law of Compensation). In them I recognised, among other things, the importance of the transformation of the personality described by Venzlaff[9]. In 1981 a disaster happened in Spain, caused by a massive intoxication with an olive oil fraudulently mixed with adulterated rapeseed oil. In the course of three months more than 20,000 persons were affected, about 400 died[13] and almost 7,000, 33.5 % of the intoxicated, needed the intervention of mental health teams. Here I learned about the importance of social vulnerability and I proposed a model which integrates biological, psychological and social aspects to which I will refer to later on[14,15]. As a consequence of all this I joined in the European Group on Coping with Disaster (Euro Act Dis) to investigate the consequences of disasters, then chaired by Schüffel (1993)[16]. Unfortunately, I must say, I have had the occasion to treat victims of terrorist acts in Spain, or political prosecutions, what has allowed me to know more in depth the clinical syndromes[17]. Research in the field of psycho-neuro-endocrinology has lead me to the conclusion that knowledge on the neurohumoral mechanisms of stress is essential to delve in the etiopathogenic mechanisms of the clinical manifestations and in the development of more adequate diagnostic criteria and intervention strategies[18].

The World Psychiatric Association has long shown old a great interest for the subject. I have already mentioned the Section on Military & Disaster Psychiatry. The most relevant experts in the field are represented in this Section: Lebigot, Benyakar, Collazo, Crocq, García de León, Jones, Adelaja, Chaskel, Fajri, Savary, de Clercq and others. There are also two Sections with interests in the field: the Section on Psychological Consequences of Torture & Persecution chaired by Inge Genefke and the Section on Anxiety & Obsessive Compulsive Disorders chaired by Joseph Zohar, that deals with post-traumatic stress disorder. An excellent review of the topic was presented at the XI World Congress of Psychiatry in Hamburg[19]. Finally, in September 2001, an International Congress on New Commitments for Psychiatrists, in which the importance of their intervention in disastrous situations of the present world were pointed out, among them the consequence of violence, of great socio-political changes and migrations. During this Congress a videoconference allowed to develop a session with the participation of experts present in Madrid with other two groups of North American colleagues who intervened directly in the psychological help and in the design of interventions for those affected by the terrorist attacks in New York and Washington on the 11th of September.

DEFINITIONS OF DISASTER

The difficulty to define

It is almost impossible to find an acceptable definition by a majority of what a disaster is. Korver[20] collected many years ago forty different definitions of disaster and many more have appeared since then; I will refer to some of them later on. Some authors (Freud[21], Winnik[22], Furst[23], Crocq[24,25], Benyacar[26] consider that the notion of what a traumatic event is, is inherent to the complexity of human existence and therefore inaccessible to a consensus. However, it is necessary to define what a disaster is in order to face the risks derived from them and their consequences. Quarantelli[27] states that if the experts do not reach an agreement on whether a disaster is a physical event or a social construct, the field will have serious intellectual problems and that the worries about what a disaster is does not mean becoming involved in an futile academical exercise. On the contrary, it consists on delving into what are important and significant of the characteristics of the phenomenon, of the conditions that lead to it and to its consequences. On the other hand, judicial definitions are also needed to guide the interventions following a disaster, for instance, when a government declares a region devastated by flooding as «catastrophe area».

But further, definition is needed to understand, because any concrete disaster unchains the question on its meaning. Therefore the conceptualisation of what disaster is is necessary to cope and to understand it.

Danger, risk, disaster

A danger is an event or a natural characteristic that implies a risk for human beings, that is to say, it is the agent that, at a certain moment, produces individual or collective harm. A danger is therefore something potential.

A risk is the degree of exposition to the danger, it is therefore something probable. A reef in a nautical map is a danger, but it only is a risk for those who sail in waters nearby.

A disaster is the consequence of a danger, the actualisation of the risk.

Elements of the definitions of disaster

Most dictionaries define disasters and catastrophes in similar ways, as events in which there is a lot of harm and destruction. The word catastrophe has a larger and deeper semantic scope than a disaster, as I will analyse further on. For the moment, I will consider them both as synonymous.

Literature on disasters and catastrophes offers more precise definitions from different perspectives.

The magnitude of the damages produced by the event

Human losses, number of injured persons, material and economic losses and the harm produced to the environment are often considered in order to define a disaster. For some the number of 25 deceased has to be exceeded, for others this figure has to be superior, more than 100 deceased and more than 100 injured or losses worth more than one million US dollars[28] and for others the limit is still higher: an event leading to 500 deaths or $10 million in damages[29]. According to Wright[30], experience shows that when an event affects more than 120 persons, except for cases of war, non-routine interventions and the coordination between the different organisations are needed, something which is already pointing out other important characteristics of a disaster. For German insurance companies damages or human life losses superior to one million deutsche Mark or more than 1,000 deceased are needed[31]. These figures are obviously given in order to limit responsibilities of insurance policies.

To define a disaster based on the magnitude of the damage caused has many inconveniences. First, it may be difficult to evaluate the damages in a first stage or to assign them later on. Second, they are of no use for comparative studies in different countries or social situations and they are affected by inflation[32]. Third, disasters are very different among them. Earthquakes of the same intensity are a fright in California nowadays but would have been a catastrophe before 1989 and would be a catastrophe in many developing countries at present. There may even exist disasters with zero harm. The best example for this was the broadcasting in 1938 by Orson Welles of *The War of the Worlds*[33]. More than one million persons showed intense panic reactions because of what they believed to be a Martian invasion. But, what is more important, these kinds of definitions fail to capture what is essential in a disaster, as we will see.

Exceptional external agent

Disasters are often considered as elements of the physical environment harmful for human beings and caused by forces strange to them[34,35]. It has also been assumed that disasters are the consequence of not very frequent and non-routine events[36]. Disasters are normally unforeseen and catch the population and administration affected off-guard. However, there are disasters that repeat themselves, for example in areas affected by flooding and others, which are persistent, like in, may forms of terrorism. In these cases a culture of adaptation and resignation to disasters develops.

Disasters are normally considered as events «by chance» and therefore unavoidable. In the past they were ascribed to a divine punishment, and even nowadays it is not strange to read that an event «reached Biblical proportions», or that nature's powers have been unchained

as they did when God had to punish evilness of human beings with the Flood. In fact, the etymology of disaster, from Latin *desastrum* (des "lack, loss", *astrum* "heavenly body, star"), indicates bad luck or fortune. The poem by Voltaire on the Lisbon earthquake rejects the notion of the intervention of the Divine Providence. The word started to be used in a generalised way in France, from where it extended to other countries as a consequence of the secularisation brought along with the Enlightenment.

Based on these definitions, it has been tried to precise more in depth the concepts, with regards to the dimension and nature of the impact (localisation, number of affected persons), to its presentation (if it was sudden, gradual or chronic), to its course (acute, sustained, recurrent) or to the degree of preparation of the population[37], this last fact is being analysed further on.

The severity of the exposition, the death of a beloved one, physical threat and the sense of lack of control are all risk factors present during a disaster. After the disaster occurs other risk factors related to the evacuation procedures, to the practical and emotional support provided, as well as to the interventions by professionals appear[19].

An important characteristic of disasters is their centrality[38]. A disaster is peripheral when the persons where in the place by chance (for example, in a plane crash) and when the damnified come back to their intact social surrounding where they can rely on the support of their relatives. Catastrophes are disasters of a great magnitude, of a great centrality. A total breakdown of everyday functioning takes place in them, with the disappearance of the normal social functioning, loss of immediate leaderships, the insufficiency of the health and emergency systems, in such a way that the survivors do not know where to go to receive help.

The nature of the agent

Human made disasters are normally distinguished from those consequence of nature inclemency. Among the first ones, some of them are not intentioned, that is to say, they are a consequence of human errors. In this case, the responsibility is considered to be institutional, and compensations from insurance companies are granted. Possible calculated risks should be guaranteed based on from their probability.

There are also disasters that are the consequence of a clear intention as in the case of conventional war. In these cases, individuals are able to start up more or less legitimate or efficient coping or defence mechanisms to confront the aggression. The First World War was a war of fronts that affected the rearguard little, while in Spanish Civil War and in Second World War there were as many victims in the front as in the rearguard due to combat actions (settling of scores, bombings on the civil population, and so on). Therefore the psychological and psychopathological reactions were different. During the First World War, those evacuated from the front came to a safe rearguard, in which they were assisted in an attentive way, favouring the appearance of very dramatic conversion symptoms. During Spanish Civil War[39,40] those evacuated came to a rearguard which was also affected and they presented more psychosomatic symptoms, that's to say, more internalised ones. The same happened during Second World War.

In other occasions, violence is due to terrorist attacks, assaults by rapists or by similar events. This is an anonymous violence whose goal is to cause harm to anybody, something that prevents the affected from developing any kind of defence. This kind of violence may affect any person, in any place of the world, at any time.

In disasters produced by nature inclemency, the kind normally determines the way the pain is lived and the guilt. Some are more foreseeable, like for example in hurricane areas, volcano eruptions or floodings and other are not as foreseeable, like some earthquakes or massive fires.

However, it is not possible to accept that there are purely natural disasters, since human hand is always present. This is Steinberg's thesis[41] that has studied a large series of disasters in the USA. It has to be taken into account that the degree of development of a community is a determinant fact. Between 1960 and 1987, 41 out of the 109 worst natural disasters took place in developing countries in which 758,850 persons died, while the remaining 59 % of disasters took place in developed countries in which 11.441 persons died[42]. In another series studied between 1990 and 1998, 94% out of the 568 greater disasters occurred in poor countries causing 97 % of deaths related to them. It is curious enough that these proportions are similar to the ones caused by famine, by HIV or by refugees[43].

Threat for the social systems

Definitions of disasters based on the idea of an exceptional agent are not fully satisfying. In fact when reviewing them already other elements appears which are related to the social conditions. The flooding of an uninhabited non-cultivated plain with no ecological value is not a disaster, human development is needed. Carr[44] was the first one to point out the importance of the social aspects:

> *Not every windstorm, earth-tremor, or rush of water is a catastrophe. A catastrophe is known by its works; that is to say, by the occurrence of disaster. So long as the ship rides out the storm, so long as the city resists the earth-shocks, so long as the levees hold, there is no disaster. It is the collapse of the cultural protections that constitutes the disaster proper.*

Therefore the impact of a danger on a social group is related to the mechanisms and adaptation ability the community has developed to face up to the effects of potential destructive events. If they are efficient, we can speak of an emergency, not of a disaster (a traffic accident with ten victims is a disaster in a little village not in a city[45]), hence the importance of transportation.

Disasters have been defined from this perspective as external attacks that break social systems[34,35], which exert a disruptive effect on the social structure[26]. The social, political and economic environment is as determinant as the natural environment, it is what makes that dangers turn into disasters[46] and the disruptive may create more difficulties than its physical consequences[47].

The United Nations Co-ordinating Committee for Disasters (UNDRCO)[48] stipulates that a disaster, seen from a sociological point of view, is an event located in time and space, producing conditions under which the continuity of the structures and of the social processes turns problematic and *The American College of Emergency Psysicians*[49] points out that a disaster is a massive and speedy disproportion between hostile elements of any kind and the available survival resources in order to rebalance the situation in the shortest period of time possible[50]. The same appears in a definition by the WHO[51]:

> *A disaster is a severe psychological and psychosocial disruption, that largely exceeds the ability to cope of the affected community.*

In the United Nations glossary[52] we find the same:

> *A serious disruption of the functioning of society, causing widespread human, material, or environmental losses which exceed the ability of affected society to cope using only its own resources.*

Crocq et al.[53] point out the importance of the loss of social organisation after a disaster. For them the most constant characteristic is the alteration of social systems that secure the harmonious functioning of a society (information systems, circulation of persons and goods, production and energy consumption, food and water distribution, health care, public order and security keeping, as well as everything related to the corpses and funerary ceremonies in cemeteries).

In summary, disasters are events consequence of a danger, that affect a social group and which produce such material and human losses that the resources of the community is overflown and therefore, the usual social mechanisms to cope with emergencies are insufficient.

The impact of the disaster can be cushioned by the ability of those affected to psychologically adapt, by the ability of the community structures to adapt to the disaster and its consequences or by the quantity and kind of external help.

Therefore usually three levels of disasters are described:

- **Level I.** It is a localised event with few victims, with local health resources available, adequate to treat, stabilise, evacuate and to screen and with transportation means available for ulterior diagnosis and treatment.
- **Level II.** There are a lot of victims and resources are not enough, therefore help coming from various organisms at a regional level is needed (the definition varies according to the size and kind of territorial organisation of the country).
- **Level III.** In this case the harm is massive, local and regional resources available are insufficient outgrown and the deficiencies are so large that national or international help is needed.

As a consequence, it has to be pointed out a disaster is something exceptional, not only because of its magnitude: it is not enough to mobilise more material and staff, they go beyond the jurisdiction of organisms and institutions, unfamiliar tasks have to be carried out, changes in the organisations of the institutions in charge of responding to the disaster are enforced, new organisations appear and persons and institutions which normally do not respond to emergencies, are mobilised. Moreover, in some cases, the efficacy of teams and resources that serve emergencies decreases and as a consequence of these changes, the normal processes to coordinate the response of the community to the emergency may not adapt correctly to the disaster situation.

Disasters induce huge social mobilisations and solidarity[54], sometimes a great part of this help is counterproductive, creating the so-called problems of the second disaster, when excessive and unorganised help arrives causing a slow down in recovery and interfering with the long term evolution. A good previous plans and preparation is therefore most important[55].

Several things are needed in order to produce a disaster: an extraordinary event able to destroy material goods, to provoke the death or persons or to produce injuries and suffering[56], or an event in front of which the community lacks of any adequate social guidelines to react[57]. This leads to the need of intervention and of external support, to a personal sensation of helplessness, to feel threatened, to tensions between the social systems and the individuals[58], as well as to a deterioration of the links that unite the population and of the prevalence of the sense of pertaining to the community[59].

Social vulnerability in disasters

Disasters not only affect social functioning; they are also the consequence of a certain social vulnerability up to then hardly perceived. They reveal previous failures.

Vulnerability decreases with the degree of development of civilisations, which in essence precisely aims to that, to protect human beings from the negative consequences of their behaviour and from the forces unchained by nature[60].

This social vulnerability is present even in the clinical reactions to disasters. Among the risk factors for post-traumatic stress disorder more often identified in the USA are the following: female sex, to be Hispanic[61], personal and familiar history of psychiatric disorders, experiences with previous traumas, specially during childhood, poor social stability, low intelligence, neurotic traits, low self-esteem, negative beliefs on oneself and the world and an external locus of control[62]. Curiously enough there is a preventing factor which is political activism.

In the toxic oil syndrome we described a social vulnerability[15], a clear appearing fact since the toxic, whichever it was, did not pass the hemato-encephalic barrier and those affected did not suffer from symptoms consequence of a direct cerebral harm. Determining factors, in this study, for the appearance of psychopathological sequelae were: predominance of female sex, low socio-economic level, low educational level, previous history of «nervous disorders» and of psychiatric consultations.

On the other hand, Spanish society in 1981, year in which occurred the Toxic Oil Syndrome, was not one of the most stable periods from a political point of view: in January Adolfo Suárez resigned as prime minister, on February 4th, during a visit of the King and Queen to the provincial government of Gernika, congressmen of a left wing separatist party violently interrupted the speech of the King with nationalistic screams and songs; on February 20th, first voting for the investiture of Calvo Sotelo as president, in which he does not reach absolute majority and on February 23rd, Tejero and quite a number of troops invaded the Parliament.

Post-modern perspective

Quarantelli[27] introduced a post-modern perspective considering disasters from the subjective perspective of those affected, in which rescue staff and all those who have been involved, affected or even shown interest, should be included. Almost always when I have spoken or written an article about this subject I have been pushed to talk about my own personal experience, without doubt because a personal testimony is essential. A disaster, any disaster, affects intimately and stirs up the foundations of the world everyone builds for his/her own and where he/she lives, as we will see further on.

But, moreover, a disaster affects a community and is like a magnifying glass that increases the appreciation for a lack of social justice and equity. From this perspective, disasters are part of a social change, not of the social problem, they are more an opportunity than an event, they are social crisis which open new perspectives. That's to say, they are crisis which affect a community which further develops a consensus and collective efforts to face up crisis in general.

Disasters are political events

Several authors have dealt with this important aspect of a disaster. If politics is an allocation of values, the link between politics and disasters is determined by the allocation of values on the authorities regarding security in the period previous to the event, the survival possibilities during the emergency stage and the opportunities to reintegrate in society during recovery and reconstruction[63].

A disaster is also a political opportunity to develop innovative initiatives, essential to diminish the present and future consequences of the danger. However, not all events attract the same degree of attention and unchain a political reaction. Social vulnerability, mentioned before, and politics play an important role here[64]. A thorough statistical study[65] on the relationship between the severity of the disaster and the poor political stability showed that the repercussion is restrained by the repression exercised by an authoritarian regime and by a high level of development, but not because of inequality of income (this last fact against the hypothesis of the authors).

There is also a political use of disasters analysed by Edelman[66]. Governments usually behave in different ways when confronted with problems and with a crisis. In case of problems they try to cause a systematic deflation of the attention on the inequality of the goods and services offered to the population. On the contrary, in case of a crisis, they try a systematic inflation of threats, allowing them to legitimate and demand an increase of authority. When crisis repeat themselves, authoritarianism increases, a fact that is not restrained by the presence of problems because they are dampened. In this way, governments maintain their liturgies in order to increase of authoritarian power.

The political management of a crisis is based on a political and organisational symbology and opens up new opportunities for those responsible for new initiatives and for other players who achieve visibility and prominence. In this way, the directive elite exploits symbology in order to influence the collective conceptualisation of the situation and to enhance the chosen actions. Concrete strategies are started like for example the framing of the crisis in a determined context, the ritualisation maintained by collective action and the masking of possible alternative conceptualisations[66]. It has to be pointed out that Edelman's remarks can be applied to any kind of crisis, for example, in the management of corporations.

Scapegoating in disasters

Disasters are a great opportunity to appoint scapegoats; efforts to burden the guilt on a person or a group are constant.

But scapegoating is not a means for finding and assigning responsibility. It is a means for avoiding finding and assigning true responsibility, on the contrary it is the best way of avoiding to find the true responsability.

> *Whenever a single cause for any event is sought in the human realm, it is thus very natural for one to look for who, as a singular agent, is responsible. If the event in questions is a disaster, then the first inclination is to look for whose fault it is. Once blame can be assigned, the existence of the disaster will have been explained. Finding the guilty party or parties solves the disaster «problem». Of course it does not. What it does do, however, is to create the appearance of a solution, and this appearance of a solution cannot assist one in the prevention of further disasters* (Allison, 1993)[67].

Whenever the scapegoat mentality is at work, responsibility has been abrogated, not shouldered. Therefore, the thesis of something accidental or unavoidable cannot be accepted because in the long run it turns into a prophecy that fulfils itself and prevents from concentrating on the real causes[67].

REACTIONS TO DISASTERS

Reactions to disasters vary from one moment to another and develop at three different levels.

Stages of reactions to disasters

One aspect of stress not considered in a sufficient way in ICD-10 nor in DSM-IV is the fact that reactions to stress develop in stages. This is evident in man made as natural disasters, due to their human implication.

The reactions to disasters happen in phases. There are various descriptions of the phases of a disaster, including a different number of them, generally between three and seven. However, it has to be pointed out that all of them are characterised by a great homogeneity of the factors associated to each one of them and that they cannot be considered as rigid periods in time since their display has a great diversity in different disasters. That is to say, the important thing is to know that the mechanisms and the psychological and psychopathological consequences vary along time and that therefore they have to be anticipated although, in each given moment, several reactions may appear with different cadences.

Glass[68] has described different stages of disasters, adding for the first time the dominant psychological mechanism in each one of them. His description is based on the bombings on the civil population during Second World War, but the principles he considered apply to all disasters.

The first phase, **pre-impact period,** is previous to the event itself. Denial mechanisms are dominant in this stage: «the bomb will not fall here, Hitler will not invade Poland, the mountain of accumulated slag will not fall, the dam will resist», and so on. This phase is important since it facilitates the disaster and mainly because the reactions to it include not only the event itself, but also the causes which made it possible.

On the other hand, the most important factor is the predictive and anticipatory ability. In 1966, in the Welsh location of Aberfan[69] a huge coke hill slid down the mountainside into the mining village as a consequence of a storm, it destroyed two schools causing an elevated number of victims. The residual waste from the mining industry had been amassed during decades and it was only a question of time when it would sag, but nobody did anything to prevent. In a similar way, the dam that broke and devastated Buffalo Creek in the USA had already known damages[70-72]. Only a heavier than normal shower was needed to provoke the disaster.

The second phase is the **alarm period.** In it an inefficient hyperactivity takes place. It is a phase of panic, of heroic and altruistic behaviour, not always efficient.

The third phase described by Glass is the **impact period** that refers to the explosion of the bomb. During this stage there is no psychological reaction due to its shortness. This stage is not present in other types of disasters and may be well dismissed.

Following comes the **recoil period,** in which the mechanism put into action before start to make its effect. Exhaustion, hypoactivity, apathy and disappointment appear. In military psychiatry it is known as combat exhaustion or old sergeant's syndrome.

The fifth and last phase described by Glass is the **post-impact period.** In this phase feelings of rage and hostility may appear directed towards the alleged responsible persons or institutions but also against society in general, in which the disaster took place and specially against its leaders. All disasters leave their print in the life of a community.

However, there is another phase, to which Glass did not pay attention maybe because he wrote about them very near afterwards to the events happened during the Second World War. It is a phase of **reconciliation**[14,15] in which the social group comes again to terms with itself, buries its death and ghosts, gives a new meaning to the lives of its individuals, the ones who died and the ones who survived, be it damaged or not. This stage is not always reached, or it is not reached in a radical enough way. The monuments for those fallen in wars, or to battles, try to be this. Other times a literary work does this. The novel «Gone with the wind» by Margaret Mitchell is the best example of how to overcome a disaster, in this case the one of American Civil War.

Levels of reaction to disasters

Reactions to disasters develop in three levels: biological, psychological and social. A challenge for research is to find out inasmuch they develop in parallel and how each level influences the others.

Biological level

The biological level is stress. Stress and stressing agent or stressor are not the same. Stress is the reaction that appears when an environmental factor or factors, which are the stressing agents or stressors (physical, chemical, psychological or social), that disturb, threaten the individual or threat to disturb a state of internal balance (homeostasis). Stress is set of unspecific responses that set off before having been able to identify the specific threat. Their purpose is to prepare the individual for action, to fight or to flight.

In a first stage, an activation of the hypothalamus-hypophysis-suprarenal axis with a rapid and brief response consisting on an increase of the secretion of CRF, ACTH and glucocorticoids. Later a sustained response characterises chronic stress: a more general activation of the central nervous system takes place, specially of the neurones of the paraventricular nucleus and an increase of CRF and VP giving way to a α-adrenergic and 5-HT1a, other 5-HT,

nicotinic, cholinergic, interleukin 1, angiotensine II, TRF, Y-neuropeptide and vasopresine stimulation[73].

The consequence of all this is an increase in the activity of several neurotransmitters, among others dopamine in the limbic system, in the cortex, in the hypophysis and in the cerebellum and hormones like epinephrine, with an increase of blood pressure, pulse rate, of fat catabolism and the metabolism of carbohydrates. Also corticoids and various physiological responses increase, insulin and growth hormone secretions and also immunological responses decrease, causing among others, stress ulcers[74].

Hormonal secretion has a characteristic temporal pattern. Immediately after the impact of the stressing factor, in a few minutes, GH secretion falls and secretion of β-endorphins, ACTH and LH show an important increase, and TSH in a lesser degree. This last one stops in minutes and LH in some hours. LH secretion recovers its basal level after 4 to 5 hours although afterwards it may continue under the basal level for longer. ACTH levels are maintained over the basal level for 12 hours or more and β-endorphins until 24 hours[75].

In the last years research has been centred on the biological processes unchained after exposition to disruptive situations[76-80]. Bremner[78] has studied in a systematic way possible brain damage as a consequence of stress and Mc Ewen[79] the dysfunction and plasticity of the hippocampus. Research on the functional specificity of the amigdala and its trophic mechanisms in disruptive situations that produces a dysfunction of emotional memory has to be added[81,83].

Neuroimaging studies have provided some important data. First, a reduction of the volume of the hippocampus in persons who have been exposed to stressful situations, for example veterans of the US army[84] or women with a history of sexual abuse during childhood[85]. In PET the blood flow is generally increased but specially in the cerebellum and in the precentral, superior temporal and right fusiform circumvolutions. The cerebellosum and extra-striatal flow positively correlates with depression and post-traumatic scales[86].

Psychological level

Bakan[87] has underlined the strong parallelism between Freud's ideas[88] and the concept of reaction to stress described by Selye[89,90]. It's curious that Freud's death instinct came from the observation of the recurrence of dreams of traumatic events, which could not be explained by the libido and the desiderative character of dreams. He came to the notion of a non-libidinous, self-destructive principle: death instinct, **Thanatos.** The individual psychological response of human beings to external aggressions or threats (real or imagined) is anxiety, that at the same time unchains several defence or coping mechanisms. In some circumstances defence mechanisms anticipate themselves in order to face up threats still not identified that may result harmful for the individuals organism and, at the end, may even entail a risk for survival. The notion of self-destructive mechanisms in individuals has been mentioned by Freud in his description of the **death instinct** or **Thanatos** and is present in the concept of adaptation illnesses.

In this context it is worth to remember Sartre's[91] concept on emotion: it's a substitute behaviour in which the affected person, confronting an irrational unbearable senseless situation, assumes a metaphoric relationship with the world allowing him/her to continue living. For example, sadness is the possibility to survive the loss of a beloved person, shutting oneself in oneself, becoming isolated from a world lacking of any sense after the loss of the beloved person. Moreover, all emotions have their vegetative correlate. They are the serious face of emotion.

Emotion ends when the moment and the possibility is given to elaborate the trauma and to give it a significance, that's to say, when it is rationalised[92]. Rationalisation implies a verbalisation. The word *Logos* in Classical Greece means at the same time thought and verbalisation. Juan de Santo Tomás[93], a Spanish theologian, wrote: *Intellectus est ex sua natura loquiturus* («thinking is, by its own nature verbal expression»). If it is not verbalised it will persist, the same as its vegetative correlates, which are in case of hypertension, the way to pass from emotion to lesion[94] and even death.

A series of particular behaviours maintain the actuality of the trauma, like the avoidance of those things that may remember it, the suppression of thoughts and memories, ruminations, a behavioural pattern of avoidance of what the individual considers as «unsafe», dissociation mechanisms and alcohol and drug abuse[95].

Several psychological theories, not incompatible among them, have been postulated. For Foa et al.[96,97] there is an association of banal stimuli with fear. For Charney et al.[98] there are two different conditionings of fear, one related to environmental stimuli that unchain discomfort and another one, which is an operating and instrumental determinant that leads the way to avoidance. For Brewin et al.[99], trauma has a double representation in memory, one is accessible to verbalisation and the other one to the situation.

In any case, after a traumatic event, a transformation of the vision of the world, of oneself and of the future, takes place. Memory becomes dissociated from its context[95], requiring a readaptation process to reality consisting in a re-elaboration of the trauma[100,101]. On the other hand new beliefs appear and other false and old ones are surmounted[102], like for example «the world is a safe place» or «the worst always happens to me» or «it never rains but it pours». In any case it handles on the appearance of a new emotional conscience which, as any emotional state, is always accompanied by a vegetative correlate.

Social level

This bio-psychological model has to be expanded in order to become bio-psycho-social, including reactions to collective stresses like for example in disasters and ca-

tastrophes. Here, the overwhelming external threat has a much lesser role for individual vulnerability than for neurotic disorders. What happens in initial stages has consequences on the more advanced ones. The impact of an event for which an individual is not prepared for (no protection for immunity is available, or negation has prevented from getting prepared for action) unchains an exaggerated response, smoothing the way for consecutive responses: strain and chronic states.

In the etiopathogeny of these manifestations, group factors and the psychopathology of the masses have to be taken into account. The nature and characteristics of the group membership and factors like lack of security, isolation, intragroupal conflicts, role distribution during immediate reactions and the elaboration of sequelae are more important. Also imitation and identification mechanisms have an influence[53,103,104].

Among the factors of macrosocial predisposition are to be pointed out the low cohesion of the group, which functions as a mass. A mass is a totally unstructured group lacking of any cohesion and a common working experience. Therefore those groups recently created or re-created are very vulnerable to panic. The qualitative-quantitative failing of the organisational frame is another factor to be taken into account. There are groups with a very vulnerable precarious levels characterised by extreme nationalistic ideas and collective defence values and there are there are intrinsic fragile groups like children, frustrated individuals, and women in general. Benyacar[26] has also pointed out personal vulnerability with changes in recent life events such as marriage, divorce, death of partner, moving or changes in the job conditions.

Integrative model

The reaction stages and levels in front of a disaster can be integrated and summarised in the following chart (table 1):

CLINICAL MANIFESTATIONS OF REACTIONS TO STRESS

In order to better understand what a disaster is it is necessary to briefly consider the characteristics of the clinical manifestations of the reactions are the following:

1. Affective and emotional symptoms like anxiety, phobias, depression, irritability, apathy and withdrawal. All of them are unspecific symptoms appearing in many other disorders. They are the expression of a poor response to a stressor.

   ICD-10 follows the model Kretschmer[105] proposed for hysteria, in which are present two very primitive defence mechanisms, the tempest of movements, for example hysterical movements, what is what chickens do when they flutter around when feeling threatened in the farmyard. The second defence mechanism is the dead reflex, present in hysterical paralysis, which is a mimicry of threatened animals like when an ostrich buries its head in the sand. López Ibor senior[106] extended this description to all neurotic phenomena in general and called them ***sobresalto*** and ***sobrecogimiento*** (lit. "startle" and "shock").
2. Physiological changes, among them to be pointed out a constant vegetative hyperactivation, which may be constant or evoked by the memory of the trauma, or of other traumas.
3. Sleep disorders and dreaming, specially insomnia and untimely awakening, mainly caused by daydreaming and nightmares on the traumatic event.
4. Memory disorders, consisting in two apparently different things. On the one hand a voluntary evocation of the memories of the trauma is not possible and when doing so, the memories are confused, sketchy, unorganised and scarcely elaborated. On the other hand, memories burst in untime-

TABLE 1

	Biological level	*Psychological level*	*Social level*
	General adaptation syndrome	Posttraumatic stress disorder	Disasters
Pretrauma Negative or insufficient defences (congenital or adquired)	Lack of immunological barriers	Non-adaptative defence mechanisms, pathological life styles, and poor selfidentification	Poor planification, denial, lack of identity and social stability
Acute response	HPA axis Ergotrophic Trofotrophic	Alert period (anxiety, fright) Withdrawal period (anguish, fright)	Alert period (hyperactivity) Withdrawal period (apathy)
Chronic maladaptation	Adaptative illnesses (immunological)	Post-impact period (rage, resentment) Illness as a form and way of survival	Institucionalisation
Recovery	New immunological mechanisms	To live with the losses Sense for existence is recovered	Reconciliation

ly in the consciousness generally like **flashbacks,** with very lively and intrusive images, sometimes unchained by clues that bring the event to the memory. In other words, the memory is dissociated from its context [95].

It has to be taken into account that many theories on the function of sleep and dream coincide in the importance of the process to incorporate to memory past experiences. Sleep is an active process of memory consolidation, a cognitive process for the re-elaboration of experiences. The main function of REM sleep is to forget everything unnecessary and therefore dreaming is the consciousness organizing itself, incorporating the information the individual has available[107]. Therefore, a non-elaborated trauma erupts once and again in dreams and also during wakeful consciousness because it has not been elaborated, that's to say, it has not been added to memory nor to the forgotten heritage of past.

This interpretation coincides with some psychological theories that refer to a double representation of the trauma in the memory, one accessible to verbalisation and another one to the situation[99]. Others impinge on the two conditionings of fear, one conditioning of environmental stimuli that unchains discomfort and another operative or instrumental one, responsible for avoidance[98].

5. Behaviours that reinforce and maintain the trauma in the conscience generally through avoidance, which prevents from overcoming the object of phobia related to the trauma. The avoidance to remember, the suppression of the thought and memories, the grumbling, the «safe» behaviours, the dissociation and the alcohol or drug consume, do not help to overcome the trauma, on the contrary, they lead to an increase in the frequency of the symptoms since the suppression creates an increase of intrusive thoughts and prevents any positive changes in the behaviour.
6. Repercussion on the basic beliefs on oneself and the world. The idle effort to find a sense to the traumatic experience and the fact of worrying once and again about the trauma accompanied by feelings of guilt (because of having survived the beloved ones) and of shame. This factor leads, on the one hand, to seek for external comfort and on the other hand, to reject it due to the shame produced by the poor ability to cope with the consequences giving way to feelings like rage and hostility towards the community, considering them even responsible for the disaster and its consequences.

DO DISASTERS HAVE A MEANING?

Up to now I have been using the words disaster and catastrophe as synonymous, although pointing out some differences. One of them is the magnitude of the impact on society. In fact in many languages a catastrophe is a disaster of great proportions. Disraeli in one of his intervention in the Parliament of the UK commented that «If Mr Gladstone fell in the Thames fully clothed and was unable to swim, that would be a tragedy, but if someone rescued him, that would be a disaster»[108]. It has to be assumed that the Prime Minister would think that if after being rescued from the river, Mr. Gladstone would achieve to govern, that would be a catastrophe.

The word catastrophe comes from the Greek καταστροφη *(Katastrophé),* from κατα *(kata)* "underneath" - στροφη *(strephein)* "to turn around" and etymologically refers to the movement of the chorus on stage. Its primitive meaning is the outcome, especially when it is a very dramatic one, of a poem or a theatre play. In Oedipus King[109] catastrophe is the moment in which Oedipus recognises himself as being the one who killed his father Laius and who was sharing the bed with his mother Iocasta. The shepherd who took care of him whilst child, the chorus, Iocasta and the audience already reached that conclusion along Sophocles drama. In the moment in which the drama breaks out in front of his eyes, Oedipus, unable to face up to it, pulls out him. Up to then he had denied, as in a pre-impact phase, reality. It has to be taken into account that in classic Greece, insanity was characterised by the arrogant denial of reality. This is why Oedipus is the archetype of an insane person.

A disaster unmasks false myths

A disaster is not bad luck, it is an empirical falsification of human action, the proof of the incorrectness human beings conception on nature and culture[109]. It is also a state of lack of certainty, of unability to spot real or supposed dangers, specially when it is something incorporated to the dominant mental schemes of a community, which allows it to understand reality[60].

A disaster not only affects the structures and social functioning; also many mental schemes break down. All of a sudden death, anxiety and the loss of the sense for invulnerability becomes obvious[110]. Frankel[111], who survived a Nazi concentration camp, Brüll[112] and other have pointed out that after such an experience, sense in the context of existential experience, disappears. The vision of the world, of oneself, of the future, changes. Therefore, during the phase of overcoming the trauma a process of re-adaptation to reality, a re-elaboration of the trauma[100], the establishment of new beliefs, and the overcoming of other old and false beliefs like that the «world is a safe place» and those negative ones established after a disaster like «all the worst always happens to me», «it never rains but it pours», and so on[102], is needed.

VICTIMS OR DAMAGED?

The worst thing that can happen is the victimisation of those affected and here psychiatry can play an impor-

tant role. Benyacar[26] has called attention to this fact in a magisterial way:

Victim is a person who remains trapped by the situation, petrified in that position, passes from being an individual to become an object of the social reality, loosing his/her subjectivity. It is a Biblical concept, inherent to the expiatory needs of society. Since the moment of the disruptive event, societies' needs for restoration intermingle with the needs of the individual. The demand that the outer world repairs the harm he/she has suffered arises.

Damnified is the person that has suffered a damage, prone to be repaired or irreparable in its whole or partly. The concept «damnified» connotes psychic mobility, as well as the preserving of the individuals subjectivity. Therefore, mental health services have to assist all those affected not as victims but as damnified.

COMPENSATIONS IN DISASTERS

Reactions to disasters and their definition have always been marked by compensation. Literature on compensation neurosis is old[113]. In fact, definitions that emphasise the presence of a stressing agent of great magnitude which would affect almost any persons, as DSM-III[6] did, turn even witnesses into victims. Since a disaster destroys social frames and is a consequence of it, it is natural that any individual turns to society to ask that the harm suffered be repaired. This is why there is a tendency of the victims to maximise «secondary benefits», perpetuating the psychic harm in order to receive a compensation, be it economic, affective or of any other kind. This is reinforced by the fact that the psychic harm affects persons who functioned in parameters of normality before the disaster and if afterwards they cannot do so it is because an external factor, of a social nature, has caused them harm. According to Cohen[114] most persons and their relatives affected by a disaster have functioned in an adequate way before the tragic event, but their ability to solve problems becomes limited because of the threat inherent to the situation.

Compensations in disasters are indispensable and have to include psychic harms. However, the repercussion on the mental health of the damnified must also be evaluated, if he/she turns into a victim the risk exists to make out of the disaster and the compensation his/her new life style. Whilst the sensation of an irreparable damage persists, the victim will not drop the demand that the harm be compensated. It is true that anybody has the right to change his/her lifestyle and if the opportunity is given, to change it for another one in which he/she becomes a passive individual prone to the protection (and mending) of the Government. But it is also true that mental health professionals are there to avoid iatrogenics and should help the damnified to overcome this situation so as to prevent that the disability becomes chronic. True is also that society can impose its limits in front of any possible victimisation abuses.

Mental health professionals should participate in the allotting of indemnification and in the decision of including the damnifieds in a reintegration program to their everyday activities[26].

THERAPEUTIC INTERVENTIONS

From all what has been exposed before it can be said that an intervention in disorders secondary to severe stress has to be multifaceted, embracing all social, psychological and biological aspects.

Strategy

A mental health program has to start with the following[56,115]:

- Evaluation of the needs.
- Definition of intervention objectives.
- Consideration of alternative options.
- Design of a program.
- Initiating and implementing a care giving project in mental health.

Intervention has to be quick, as immediate as possible, following the strategy of preventing the consolidation of hard to treat clinical conditions, which could even lead to an irreversible transformation of the personality.

Intervention has to be integrated[116,117], following the model of liaison psychiatry[118,119]. It has to be carried out as near as possible to the site where the events took place [36] and include individual and collective reactions[53,120].

One of the characteristics of this kind of situations is the poor ability of the damnified to ask for help, therefore an intervention by presence and not only on demand, is needed. Therefore, the mental health professionals should directly contact the affected individuals in order to avoid the development of psychological disorders that could be unchained by the lack of the ability to cope with the event in an adequate way.

Benyacar[26] recommends the three basic elements proposed during First World War[121]: immediacy, proximity and expectancy.

Immediacy refers to the fact that the damnifieds should be assisted immediately after the event. Proximity refers to the fact that the damnified should be assisted as near as possible to the place where the event took place. This proximity was a strategy developed to avoid dramatic clinical manifestations in the conditions of First World War (see above), today what is essential is not to segregate mental health care from the rest of mental and general health care. The principle of expectancy maintains that the professional and the colleagues of the affected person have to keep expectancy and express the will that the damnified person goes back to his/her usual activities developed before the event, as soon as possible.

Mental health professionals have to be integrated into the disaster intervention staff in its different levels, the immediate as in the latter ones[116,117].

Care should be provided to the population as a whole and not only those who have suffered physical harm. It should include close relatives directly involved or those not so close, passers-by and witnesses, emergency staff, also mental health professionals and others including social leaders. It has to be taken into account that for each physically affected damnified there will be three persons which will suffer consequences in their mental health[122] and for each death or severely injured person up to 400 psychologically affected.

Extremely dramatic news, rumours, information «wars» and collective panics have to be avoided and it has to be tried to provide adequate information. Panic situations have occurred without the slightest trace of harm or threat, like the one wich followed the a broadcasting by Orson Welles in 1938[33] on Martian invasion. In the disaster of the Three Mile Island nuclear power station[123] in the USA, the press informed that it was a disaster whilst the staff in charge of the nuclear power station spoke of an incident. Some weeks later they agreed upon an incident.

Training, preparedness and anticipation are essential factors in order to prevent a disaster and its consequences.

Psychological interventions

In this kind of interventions the professional acts as a mediator so that the affected person is able to articulate in his/her cognitions all what has happened using his/her own idiosyncratic psychological abilities.

Cohen et al.[36,124] point out that an important goal for mental health intervention is the adequate use of techniques able to restore the ability of the damnifieds to solve the stressful situation in which they are and help them reorganise their world through social interaction. A second goal is continuous and active collaboration with other groups or institutions that offer help, support and attention to damnified persons in particular and to the community in general.

These authors add that clear therapeutical intervention guidelines have to be taken into account. Among them:

1. *Risk factors:*
   - — The patients mature or immature personality.
   - — Stress related to social behavioural functions or expectancies, according to what the damnified themselves and their relatives, consider.
   - — Persisting environmental stress in the physical as well as in the social environment.
   - — Crisis the damnified may have experienced before or after the disaster.
2. *Social environment.* The social environment in which the damnifieds are resettled is an important variable that affects decisions about the type of psychological intervention. The specific intervention type for each environment has to be clarified.
3. *Medical and clinical resources.* The diagnosis of disorders that put life in a considerable risk, require the intervention of medical staff and have to be part of the evaluation process.

Essential intervention aspects are verbalisation, interviewing and social support strategies. Group therapy is also essential, as well as the incorporation of the affected persons to rescue activities, as long as this is feasible.

The formulation of a differential diagnosis is important, also the identification of severe cases and those which cannot be treated on site and have to be evacuated to rearguard positions or even to psychiatric units.

«Psychiatrisation» of cases should be avoided, as well as the problem of associating stigma of mental illnesses to the harm.

Individual psychological resources have to be favoured and mobilised trying to avoid victimisation and an indiscriminate and exaggerated compensation system. A iatrogenic type compensation neurosis should be avoided as much as possible.

Pharmacological treatments

Psychosocial measures have to be accompanied by pharmacological interventions[125-127], aimed to diminish non-adaptative physiological responses. Taking into account their role in the treatment of anxiety, selective inhibitors of serotonine reuptake are a good option.

REFERENCES

1. Montanelli I. La historia de Roma. Barcelona: Plaza y Janés, 1985.
2. Voltaire. Poème sur le désastre de Lisbonne, ou examen de cet axiome: tout est bien. En: Oevrès complètes. Paris: Molard, 1877-1985.
3. Alonso J. Misterios de la arqueología y del pasado, 1997; 5:14-5.
4. WHO (World Health Organization International Classification of Diseases), 6th ed. (ICD-6). Genève, 1948.
5. APA (American Psychiatric Association) Diagnostic and Statistical Manual of Mental Disorders, 4th ed., text revision (DSM-IV-TR). Washington, 2000. Traducción española: Manual diagnóstico y estadístico de los trastornos mentales, 4.ª ed., revisión del texto (DSM-IV-TR). Barcelona: Masson, 2002.
6. APA (American Psychiatric Association) Diagnostic and Statistical Manual of Mental Disorders, 3rd ed. (DSM III). Washington, 1980. Traducción española: Manual diagnóstico y estadístico de los trastornos mentales, 3.ª ed. (DSM-III). Barcelona: Masson, 1985.
7. WHO (World Health Organization). The ICD-10 International Classification of Mental and Behavioral Disorders. Clinical descriptions and diagnostic guidelines. Genève,

1992. Traducción española: Clasificación Internacional de las Enfermedades. Capítulo V (F): Trastornos mentales y del comportamiento. Madrid: Meditor, 1992.
8. Arendt H. Von der Menschlichkeit in finsteren Zeiten. München: R. Piper & Co. Verlag, 1960.
9. Venzlaff U. Die psychoreaktiver Störungen nach entschädingungspflichten Ereignissen. Berlin: Springer Verlag, 1958.
10. Baeyer W, Häfner H, Kisker KP. Psychiatrie der Verfolgten. Psychopathologische und gutachtliche Erfahrungen an Opfern der Nationalsozialistischen verfolgung und vergleichbarer Extrembelastungen. Berlin: Springer Verlag, 1964.
11. Kasl SV, Chisholm RF, Eskenazi B. The impact of the accident at the Three Mile Island on the behavior and well-being of nuclear workers. Part I: perceptions and evaluations, behavioral responses and work-related attitudes and feelings. Part II: job tension, psychophysiological symptoms and indices of distress. Am J Public Health 1981;71:472-95.
12. López-Ibor Aliño JJ Jr, Soria J, Cañas F, Rodríguez-Gamazo M. Psychopathological aspects of the toxic oil syndrome catastrophe. Br J Psychiatry 1985;47:352-65.
13. Posada de la Paz M, Philen RM, Schurz HH. Epidemiologic evidence for a new class of compounds associated with toxic oil syndrome. Epidemiology 1999;10(2): 130-4.
14. López-Ibor Aliño JJ. Social reinsertation after catastrophes. The toxic oil syndrome experience. Eur J Psychiatry 1986;1:12-9.
15. López-Ibor JJ Jr, Jiménez Arriero MA. Psychosocial rehabilitation in disasters: experience of the Spanish toxic oil syndrome. Int Disabil Stud 1987;9(2):81-3.
16. Schüffel W. The mining disaster of Borken, the implementation of a 3-year support programme and the help through EuroActDIS. J R Soc Med 1993;86(11):625-7.
17. López-Ibor JJ. The classification of stress related disorders. Psycopathology 2002;35:107-11
18. López-Ibor JJ Jr, Saiz-Ruiz J, Moral L, Moreno I, Viñas R. Neuroendocrine serotonergic challenges in clinical research. En: Sandler M, Coppen A, Harnett S, editores. 5-hydroxytryptamine in psychiatry. Oxford: Oxford University Press, 1991; p. 166-76.
19. Bromet E, Havenaar JM. Mental health consequences of disasters. En: Sartorius N, Gaebel W, López-Ibor JJ, Maj M, editores. Psychiatry in society. New York: John Wiley & sons, 2002; p. 240-62.
20. Korver AJH. What is disaster? Prehospital Disaster Med 1987;2:152-3.
21. Freud A. Foreword to basic psychoanalytic concepts on the theory of dreams. En: Nagera H, editor. The hampstead clinic psychoanalitic library. London: Maresfield Reprints, 1969. Vol II.
22. Winnik HZ. Second thoughts about psychic trauma. Isr Ann Psychiatr Relat Discip 1969;7(1):82-95.
23. Furst SS. The stimulus barrier and the pathogenicity of trauma. Int J Psychoanal 1978;59(2-3):345-52.
24. Crocq L. Panorama des séquelles des traumatisms psychiques. Nérvoses traumatiques, états de stress post-traumatique et autres séquelles. Psychol Med (Paris) 1992;24:427-32.
25. Crocq L. Le trauma et ses mythes. Psychol Med (Paris) 1993;25:992-9.
26. Benyakar M. Salud mental en situaciones de desastres: nuevos desafíos. Revista de Neurología Neurocirugía y Psiquiatría de México 2002;35(1):3-25.
27. Quarantelli EL. What is a disaster? Perspectives on the question. Londres: Routledge, 1998.
28. Sheehan L, Hewitt K. A pilot survey of global natural disasters of the past twenty years. Univ of Tor Natural Hazard Research, 1969.
29. Tobin GA, Montz BE. Disaster dimensions and chronology. En: Natural Hazards: explanation and integration. Capítulo 2. Physical dimensions of natural hazards. New York: Guilford Publishing, 1997; p. 48-114.
30. Wright SB. Northridge earthquake: property tax relief. Disaster legislation. Washington: Publications The White House, 1997.
31. Dombrowsky WR. Again and again - is a disaster what we call a «disaster». En: Quarantelli EL, editor. What is a disaster. Vol 3. London: Routledge, 1998; p. 241-54.
32. Dynes RR. Coming to terms with community disaster. En: Quarantelli EL, editor. What is a disaster? London: Routledge, 1998; p. 109-26.
33. Holmsten B, Lubertozzi A. The complete War of the Worlds. Illinois: Sourcebooks, 2001.
34. Burton I, Kates R. The perception of natural hazards in resource management. Nat Resour J 1964;3:412-41.
35. Burton I, Kates R, White G. The environment as hazard, 2.ª ed. New York: Guilford Press, 1993.
36. Cohen RE, Ahearn FL Jr. Manual de la atención de salud mental para víctimas de desastres. México: Harla, 1989.
37. Barton A. Communities in disaster. New York: Doubleday, 1969.
38. Green BL. Assessing levels of psychological impairment following disaster. J Nerv Ment Dis 1982;170:544-52.
39. López Ibor JJ. Neurosis de guerra. Madrid: Editorial Científico-Médica, 1942.
40. Rojas Ballesteros L. Alteraciones psíquicas de guerra. Actas Luso Esp Neurol Psiquiatr 1943;3(2):90-112.
41. Steinberg T. Acts of God: the unnatural history of natural disaster in America. New York: Oxford University Press, 2000.
42. Benz G. List of major natural disasters 1960-1987. Earthquake and Volcanoes 1989;20:226-8.
43. Easterly W. The Elusive quest for growth, economists' adventures and misadventures in the tropics. Cumberland, USA: MIT Press, 2001.
44. Carr L. Disaster and the sequence-pattern concept of social change. Am J Sociol 1932;38:207-18.

45. Quarantelli EL. Ten criteria for evaluating the management of community disasters. Disasters 1997;21(1):39-56.
46. Blaikie P, Cannon T, Davis I, Wisner B. At risk: natural hazards, people's vulnerability, and disasters. London: Routledge, 1994.
47. Quarantelli EL. Community and organizational preparations for and responses to acute chemical emergencies and disasters in the united states: research findings and their wider applicability. En: Gow HBF, Kay RW, editores. Emergency planning for industrial hazards. Londres: Elsevier, 1988; p. 251-73.
48. UNDRCO (United Nations Disaster Relief Coordinator Office). Disaster prevention and mitigation, vol. II, preparedness aspects. New York: United Nations, 1984.
49. American College of Emergency Psysicians. Disaster medical services. Ann Emerg Med 1985;14:1026.
50. Dynes R, De Marchi B, Pelanda C. Sociology of disasters. Milano: Franco Angelli, 1987.
51. WHO (World Health Organization). Psychosocial consequences of disasters-prevention and management. WHO, Genève, 1991.
52. UN (United Nations) Department of Humanitarian Affairs. Internationally Agreed Glossary of Basic Terms Related to Disaster Management (DNA/93/36), Genève Switzerland: UN, 1992.
53. Crocq L, Doutheau C, Louville P, Cremniter D. Psychiatrie de catastrophe. Réactions immédiates et différées, troubles séquellaires. Paniques et psychopathologie collective. Encyclopédie Médico-Chirurgical Psychiatrie. Paris: Elsevier, 1998; 37-113 D-10, 8 p.
54. Blocker TJ, Burke Rochford E, Sherkat DE. Political responses to natural disaster: social movement participation following a flood disaster. Int J Mass Emerg Disasters 1991;9:367-82.
55. Cuny FC. Disasters and development. New York: Oxford University Press, 1983.
56. Cohen R. Salud mental para víctimas de desastres. Manual para trabajadores. Organización Panamericana de la Salud. Washington, 1999.
57. Anderson JW. Cultural adaptation to threatened disaster. Hum Organ 1968;27:298-307.
58. Schulberg HC. Disaster, crisis theory and intervention strategies. Omega 5 1974;77-87.
59. Erikson P, Drabek TE, Key WH, Crowe JL. Families in disaster. Int J Mass Emerg Disasters 1976;1:206-13.
60. Gilbert J E. Human behaviour under conditions of disaster. Med Serv J Can 1958;14(5):318-24.
61. Ruef AM, Litz BT, Schlenger WE. Hispanic ethnicity and risk for combat-related posttraumatic stress disorder. Cultur Divers Ethnic Minor Psychol 2000;6(3):235-51.
62. Van Zelst WH, de Beurs E, Beekman AT, Deeg DJ, van Dyck R. Prevalence and risk factors of posttraumatic stress disorder in older adults. Psychother Psychosom 2003;72 (6):333-42.
63. Olson RS. Toward a politics of disaster: losses, values, agendas, and blame. Int J Mass Emerg Disasters 2000;18: 265-87.
64. Birkland TA. After disaster. Washington: Georgetown University Press, 1997.
65. Drury AC, Olson RS. Disasters and political unrest: an empirical investigation. J Conting Crisis Manag 1998;6: 153-61.
66. Edelman M. Political Language: Words that succeed and policies that fail. Florida: Academic Press, 1997.
67. Allinson RE. Global disasters: inquiries into management ethics. New York: Prentice Hall, 1993.
68. Glass A J. Psychological aspects of disasters. JAMA 1959; 171:188-91.
69. Morgan L, Scourfield J, Williams D, Jasper A, Lewis G. The Aberfan disaster: 33-year follow-up of survivors. Br J Psychiatry 2003;182:532-6.
70. Titchener JL, Kapp FT. Family and character change at Buffalo Creek. Am J Psychiatry 1976;133:295-9.
71. Newman C J. Children of disaster: clinical observations at Buffalo Creek. Am J Psychiatry 1976;133:306-12.
72. Rangell B. Discussion of the Buffalo Creek disaster: The course of psychic trauma. Am J Psychiatry 1976;133:313-6.
73. Díaz-Marsá M, Molina R, Lozano M C, Carrasco J L. Bases biológicas del trastorno por estrés postraumático. Actas Esp Psiquiatr 2000;28(6):379-84.
74. Yehuda R. Sensitization of the hypothalamic-pituitary-adrenal axis in posttraumatic stress disorder. En: Yehuda R, McFarlane AC, editores. Psychobioloy of Posttraumatic Stress Disorder. New York: Academy of Sciences, 1997; p. 57-75.
75. Baram TZ, Yi S, Avishai-Eliner S, Schultz L. Development neurobiology of the stress response: multilevel regulation of corticotropin-releasing hormone function. Ann N Y Acad Sci 1997;814:252-65.
76. Bremner JD, Krystal JH, Southwick SM, Charney DS. Functional neuroanatomical correlates of the effects of stress on memory. J Trauma Stress 1995;8(4):527-53.
77. Yehuda R. Biology of posttraumatic stress disorder. J Clin Psychiatry 2000;61(Suppl 7):14-21.
78. Bremner JD. Does stress damage the brain? Biol Psychiatry 1999;45(7):797-805.
79. McEwen B S. Stress and hippocampal plasticity. Annu Rev Neurosci 1999;22:105-22.
80. Gould E, Tanapat P. Stress and hippocampal neurogenesis. Biol Psychiatry 1999;46(11):1472-9.
81. Roozendaal B, Koolhaas JM, Bohus B. The role of the central amygdala in stress and adaption. Acta Physiol Scand 199740(Suppl 6):51-4.
82. Post RM, Weiss SR, Li H, Smith MA, Zhang LX, Xing G, et al. Neural plasticity and emotional memory. Dev Psychopathol 1998;10(4):829-55.
83. Cahill L, McGaugh J L. Mechanisms of emotional arousal and lasting declarative memory. Trends Neurosci 1998; 21(7):294-9.
84. Hedges DW, Allen S, Tate DF, Thatcher GW, Miller MJ, Rice SA, et al. Reduced hippocampal volume in alcohol and

substance naive Vietnam combat veterans with posttraumatic stress disorder. Cogn Behav Neurol 2003;16(4):219-24.
85. Bremner JD, Vythilingam M, Vermetten E, Southwick SM, McGlashan T, Nazeer A, et al. MRI and PET study of deficits in hippocampal structure and function in women with childhood sexual abuse and posttraumatic stress disorder. Am J Psychiatry 2003;160(5):924-32.
86. Bonne O, Gilboa A, Louzoun Y, Brandes D, Yona I, Lester H, et al. Resting regional cerebral perfusion in recent posttraumatic stress disorder. Biol Psychiatry 2003;54(10): 1077-86.
87. Bakan D. Disease, pain and sacrifice. Chicago: University of Chicago Press, 1968.
88. Freud S. Beyond the pleasure principle. The International Psychoanalytical Library, No. 4. CJM Hubback (authorized translation), 2.ª ed. London: Hogarth Press, 1922.
89. Selye H. The stress of life, New York: McGraw-Hill, 1956.
90. Selye H. The stress concept today. En: Kutash IL, Schlesinger LB, editors. Handbook on stress and anxiety. California: Jossey-Bass, 1980.
91. Sartre JP. Esquisse d'une théorie des émotions. París: Hermann, 1939.
92. López-Ibor JJ Jr, Ortiz Alonso T, López-Ibor MI. Lecciones de psicología médica. Barcelona: Masson, 1999.
93. Juan de Santo Tomás. Cursus Theologicus (1637-67).
94. Weizsäcker Viktor von. Der kranke Mensch. Stuttgart: KF Koehler Verlag, 1951.
95. Ehlers A, Clark DM. A cognitive model of posttraumatic stress disorder. Beha Res Ther 2000;38(4):319-45.
96. Foa EB, Kozak MJ. Emotional processing of fear: exposure to corrective information. Psychol Bull 1986; 99(1):20-35.
97. Foa FB. Psychological processes related to recovery from a trauma and an effective treatment for PTSD. Ann N Y Acad Sci 1997;821:410-24.
98. Charney DS, Deutch AY, Krystal JH, Southwick SM, Davis M. Psychological mechanisms of posttraumatic stress disorder. Arch Gen Psychiatry 1993;50(4):295-305.
99. Brewin CR, Andrews B, Rose S, Kirk M. Acute stress disorder and posttraumatic stress disorder in victims of violent crime. Am J Psychiatry 1999;156(3):360-6.
100. Horowitz M J. Stress response syndromes. New York: Jason Aronson, 1976.
101. Horowitz M J. Stress-response syndromes: a review of posttraumatic stress and adjustment disorders. En: Wilson JP, Raphael B, editores. International Handbook of Traumatic Stress Syndromes. New York: Plenum Press, 1993; p. 145-55.
102. Janoff-Bulman R. Shattered assumptions: toward a new psychology of trauma. New York: Free Press, 1992.
103. Crocq L. Individual and collective behaviors in earthquakes, fire and manmade disasters. En: Spinetti G, Janiri L, editores. Psichiatria ecologia. Roma: CIC, 2001; p. 37-45.
104. Crocq L. Les traumatismes psychiques de guerre. Paris: Jacob, 1999.
105. Kretschmer E. Hysterie, reflex und instinkt. Stuttgart: Georg Thieme Verlag, 1948.
106. López Ibor JJ. La angustia vital. Madrid: Paz Montalvo, 1950.
107. Crick F, Mitchison G. The function of dream sleep. Nature 1983;304(5922):111-4.
108. Weintraub S. Disraeli: a biography. London: Hamish Hamilton, 1993.
109. Alamillo A. Sófocles. Tragedias completas (Ayax, las Traquinias, Antígona, Edipo Rey, Electra, Filoctetes, Edipo en Colono). Madrid: Gredos, 1981.
110. Lifton RJ. The Broken Connection. New York: Simon & Schuster, 1979.
111. Frankel V. Man's search of meaning, Boston: Beacon Press, 1962.
112. Brull F. The trauma-theoretical considerations. Isr Am Psychiatr 1969;7(1):96-108.
113. Kinzie JD, Goetz RR. A century of controversy surrounding post-traumatic stress stress-spectrum syndromes: the impact on DSM-III and DSM-IV. J Trauma Stress 1996; 9(2):159-79.
114. Cohen R. Mental health services for victims of disasters. World Psychiatry 2002;1:149-153.
115. Benyakar M, Kutz I, Dasberg H, Stern M. The collapse of a structure: a structural approach to trauma. J Trauma Stress 1989;2(4):431-49.
116. Collazo C. Psychiatric casualties in Malvinas war: a provisional report. En: Pichot P, Berner P, Wolf R, Thau K, editores. Psychiatry: the state of the art. New York: Plenum Press, 1985; p. 400-503.
117. Lebigot F. The advantages of immediate and postimmediate care following psychic trauma. Presented at the 5th World Congress of the International Association for Emergency Psychiatry. Brussels, 15-17 October 1998.
118. Soria J, Cañas F, López-Ibor Aliño J J, Santo-Domingo J, López-Ibor J M, Acosta E. Liaison psychiatry in massive intoxication with toxic oil. Actas Luso Esp Neurol Psiquiatr Cienc Afines 1983;11(1):14-5.
119. Soria J, Cañas F, López-Ibor Aliño JJ, Santo-Domingo J, López-Ibor JM, Acosta E. Liaison psychiatry in toxic oil syndrome. En: General Hospital Psychiatry. A challenge for the future of psychiatry. En: López-Ibor Jr. JJ, Saiz J, López-Ibor JM, editores. Proceedings of the International Congress on General Hospital Psychiatry. Ámsterdam: Excerpta Medica, 1983; p. 86-94.
120. Andreoli A. De la maladie traumatique aux interfaces du traumatisme. Esquisse d'un modèle de politique de traitement et de soins. Revue Francophone du Stress et du Trauma 2000;1(1):3-5.
121. Salmon TW. The war neuroses and their lessons. N Y J Med 1919;59:993-4.
122. Benyakar M. Trauma y estrés, perspectivas clínicas. En: Fischer HR, editor. Conceptos fundamentales de psicopatología II. Buenos Aires: Centro Editor Argentino, 1997.

123. Mufson M. Three mile island: psychological effects of a nuclear accident and mass media coverage. En: Psychosocial aspects of nuclear developments. Washington: American Psychiatric Association, 1982.
124. Cohen R, Cylp C, Genser S. Human problems in major disasters: a training curriculum for emergency medical personnel. Washington: US Government Printing Office, 1987.
125. van der Kolk BA.The drug treatment of post-traumatic stress disorder. J Affect Disord 1987;13(2):203-13.
126. Morgan CA, Krystal JH, Southwick SM. Toward early pharmacological post-traumaticstress intervetions. Biol Psychiatry 2003;53(9):834-43.
127. Friedman MJ. Future pharmacotherapy for post-traumatic stress disorder: prevention and treatment. Psychiatr Clin North Amer 2002;25(2):427-41.