Friulian Journal of Science **3.** 2003, 51-67

Epilepsy and Literary creativeness: Fyodor M. Dostoevsky

FRANC FARI*

Summary. Among the most salient biographical aspects affecting an artistic or literary genius, chronic diseases generally play a crucial role in the creation and content of literary production. This held true also for the great Russian novelist Fyodor Mikhailovitch Dostoevsky (1821-1881) who for most of his life suffered from epilepsy. Dostoevsky was greatly influenced by epilepsy. In almost all his novels there is a character affected by this pathology. To identify all possible factors associated with epilepsy, I read the following works by Dostoevky: *Poor Folk, The Double, The white nights, Uncle's Dream, The House of Dead, The Insulted and Injured, Notes from the Underground, The Gambler, Crime and Punishment, The Eternal Husband, The Idiot, The Devils, The Adolescent, The Brothers Karamazov*. All factors in line with a condition of epilepsy were classified as follows: 1) onset of epilepsy, 2) auras (in its various manifestations), 3) cry, 4) automatisms, 5) description of seizures, 6) post-ictal symptoms, 7) triggering factors, 8) interictal features. For each of these points, an excerpt of the novel, a short summary or a reference will be provided. In my opinion, Dostoevsky's epileptic symptomatology allows to hypothesize that the novelist had a focal epilepsy localized in the frontal lobe (with involvement of the anterior cingulate gyrus) with a tendency to secondary generalization. In describing epilepsy, Dostoevsky probably had two objectives in mind. The first goal was to re-state that people suffering from epilepsy were not monsters. Dostoevky's second objective was even more ambitious: not only people with epilepsy are like others but they show greater qualities in terms of cognition, philosophical and religious aspects than normal people.

Key words. Psychomotor seizure, ecstatic aura, *Doppelgänger*, temporal and frontal lobe, philosophy, religion.

* University of Udine and IRCCS E. Medea, Italy. E-mail fabbro@sv.Lnf.it

Introduction. It is known that autobiographical aspects may considerably influence the work of an artist or a writer with regard to contents and formal aspects. Among the most salient biographical aspects affecting an artistic or literary genius, chronic diseases generally play a crucial role in the creation and content of literary production. This held true also for the great Russian novelist Fyodor Mikhailovitch Dostoevsky (1821-1881) who for most of his life suffered from epilepsy. Epilepsy greatly influenced the functioning of Dostoevsky's psyche and cannot be simply considered a chronic disease like others. In this regard, Norman Geschwind clearly stated that "the epilepsy of Dostoevsky and the asthma of Proust are not comparable" (Geschwind 1972, p. 333). Epilepsy is a pathology affecting the brain and may change or influence cognitive, affective, vegetative functions, etc. Epilepsy – to different degrees according to its various forms – may influence the neurofunctional organization of the brain and the personality structure. In some cases, it may even cause some aspects of mental life to emerge that are generally hidden in "normal" individuals, such as *déjà-vus*, visual hallucinations, emotional states of fear and ecstasy, etc. All these experiences may lead the artist or writer to have an original conception of the world and may influence his creativity.

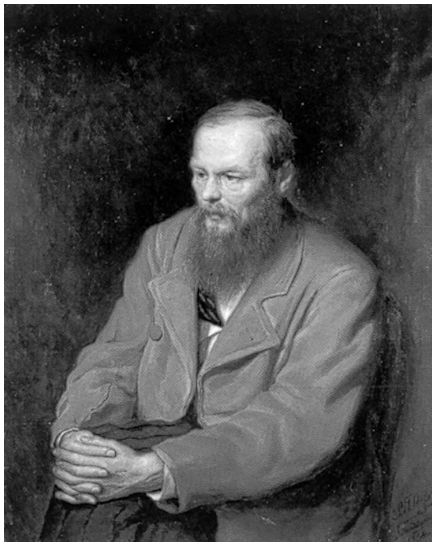
Dostoevsky was greatly influenced by epilepsy. In almost all his novels there is a character affected by this pathology. On the one hand, the novelist tried to fight negative and irrational pre-conceptions of the time whereby people with epilepsy were monsters and, on the other, he repeatedly stressed the chances epilepsy could offer to acquire deeper philosophical and religious knowledge, as efficaciously stated in *Crime and Punishment*: "Apparitions are, so to speak, shreds and fragments of other worlds, the first beginnings of them. There is, of course, no reason why a healthy man is mainly a being of this earth, and therefore for completeness and order he must live only this earthly life. But as soon as he falls ill, as soon as the normal healthy state of the organism is disturbed, the possibility of another world begins to appear, and as the illness increases, so do the contacts with the other world". [*Crime and Punishment*, Part IV, Chapter I, p. 277].

Psychomotor seizure. In psychomotor epilepsy seizures are characterized by the presence of psychological components (aura) and motor components (e.g., automatisms). Most of the patients with psychomotor epilepsy (2/3) show a secondary generalization of seizures. Onset of seizures occurs generally in late childhood or adolescence; 1/3 of the patients with psychomotor epilepsy experience important episodes of febrile convulsions in childhood. Psychomotor epilepsy, also defined as complex partial seizures, is due to abnormal electrical activity of some temporal lobe structures (temporobasal limbic, neocortical lateral temporal, opercular insular areas) or

frontal lobe structures (frontobasal-cingulate portions) (cf. Paradiso et al. 1995). The most frequent cause of psychomotor seizures is temporal lobe epilepsy (TLE). For this reason, epilepsy with psychomotor seizures and TLE are often considered as synonyms.

Aura. The psychological component of psychomotor seizures is defined as "aura" which in Latin means "breath or breeze". The aura represents the onset of seizures and is characterized by cognitive alterations and particular emotional experiences. Among the most frequent cognitive alterations there are illusions or distorsions of perceptions, visual hallucinations (simple or complex), auditory hallucinations, feeling of familiarity (*déjà vu*), feeling of strangeness (*jamais vu*), depersonalization and autoscopic phenomena. The most frequent emotional experiences are fear and anxiety, while anger, terror, elation, euphoria and ecstasy are rarer (cfr. Gloor et al. 1981; Frederiks 1985; Collins 1987). Patients with psychomotor seizures generally tend to show the same aura, with limited variations. Cerebral stimulation during neurosurgery for removal of the epileptic focus tends to recreate in these patients the psychological experiences typical of aura (Halgren 1982).

Automatisms. In some patients psychomotor seizures may be limited only to subjective manifestations of aura, in other patients subjective psychological phenomena may be followed by motor seizures, which generally occur during alterations in the state of consciousness. For this reason, after the seizure these patients do not remember what happened. Preservation of consciousness during automatisms is generally associated with focal epilepsy of the right temporal lobe (Ebner et al. 1994). Automatisms are characterized by sucking or chewing movements, or the patient may keep on walking, driving or reading. In other cases, the patient may make inappropriate actions such as speaking in an inconsistent manner or undressing in public. Intense outbursts of anger and violence are rather rare manifestations of psychomotor seizures. As has already been stated, often a psychomotor seizure ends with a generalized tonic-clonic seizure (secondary generalized



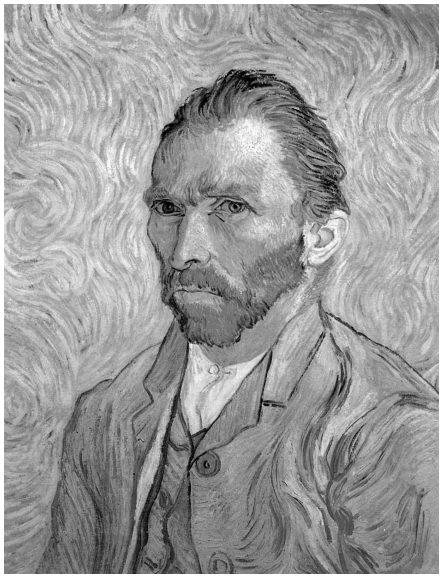
Fyodor Michailovitch Dostoevsky (1821-1881).

epilepsy). Generally, after a psychomotor seizure patients remember the aura if they only experienced a seizure characterized by subjective phenomena. If patients experienced a psychomotor seizure, they remember the aura only in 75% of the cases. This percentage decreases to 50% if after the aura patients experienced a generalized tonic-clonic seizure (Schulz et al. 1995).

Interictal seizures. Many studies showed that psychomotor seizures are associated with important changes in personality which are not present in other types of epilepsy (Bear et al. 1982). These personality changes seem to depend on long-term effects of interictal abnormal electrical activity when the epileptic focus is localized in the temporal or frontal lobe (Ebner & Hoppe 1995). According to Geschwind (1983), subcontinuous stimulation of the limbic lobe structures by the epileptic focus is responsible for psychic or personality alterations peculiar to patients with psychomotor seizures. Patients with psychomotor seizures tend to be slow and rigid in their thinking, are often fussy and boring in their conversation, sometimes they show mood changes, outbursts of anger and aggressiveness and often they are obsessive, excessively sober and generally lack humor. Often these patients show a markedly reduced sexual libido and their thinking is frequently characterized by philosophical and religious ideas. Moreover, many patients exhibit hypergraphia, that is they write accurate accounts and diaries of philosophical, moral or religious observations (cf. Bear 1979). Their main personality traits tend to be influenced by the lateralization of the epileptic focus; if the epileptic focus is localized in the left hemisphere, patients tend to show a more marked tendency to philosophical and religious interests, sense of personal destiny and paranoid thinking. If the epileptic focus is localized in the right hemisphere, patients tend to show circumstantiality, viscosity, hypermoralism, hyposexuality, hypergraphia and alterated mood, with euphoria alternating with sadness (cfr. Bear & Fedio 1977; Robert et al. 1982).

Artistic and religious personalistis affected by psychomotor epilepsy

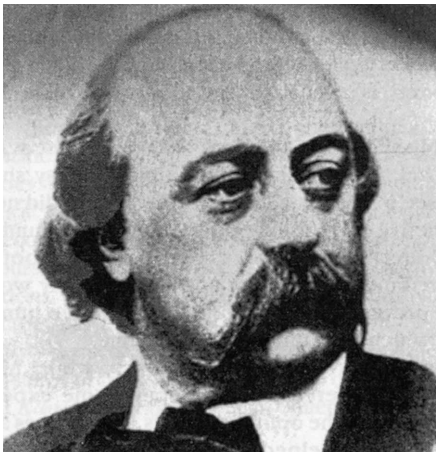
Vincent Van Gogh. One of the most renowned painters of last century, Vincent Van Gogh (1863-1890), was probably affected by psychomotor seizures (Gastaut 1956). Van Gogh had normal cognitive skills, spoke 4 languages, was easy-going and showed appropriate behavior. He never displayed generalized convulsive seizures but showed episodes of psychomotor epilepsy. In his letters he mentioned numerous episodes of sudden and unmotivated fear or terror which could be interpreted as aura of a psychomotor seizure. In his last years of life he showed many confusional episodes characterized by complex visual and auditory hallucinations. Lastly, he described many situations characterized by complex automatisms. One day, for example, while leaving the hospital, he kicked a



Vincent Van Gogh (1853-1890).

guardian without any reason. On another occasion, without any reason, he suddenly threw a glass at his friend, Gauguin. Van Gogh's personality shows many traits typical of patients affected by epilepsy with psychomotor seizures. For a long time, he exhibited a morbid hypereligiosity, was hypergraphic, showed sudden mood changes with outbursts of anger and unmotivated violence. In his last years of life he also showed a marked lack of interest for sex (hyposexuality). Dr. Felix Rey and Dr. Peyron, two physicians working at Arles Hospital, who followed Van Gogh in 1888 owing to seizures characterized by confusional states, claimed that the patient suffered from "non convulsant epilepsy". This diagnosis corresponds to today's psychomotor epilepsy.

Gustave Flaubert. Gustave Flaubert (1821-1880), the writer of *Madame Bovary*, *Bouvard et Pécuchet*, was one of the most significant novelists of the XIX century. At the age of 22, he experienced the first seizure characterized by an aura in the right visual field with a concurrent and unmotivated fear, followed by generalized seizures. The disease showed a variable evolution. From 1844 to 1850 he experienced many seizures, whereas from 1850 to 1870 he showed few seizures. Seizures became very frequent again from 1870 to 1875. Flaubert suffered from psychomotor epilepsy (complex partial seizure) with a symptomatology characterized by an aura with fear, complex hallucinations, forced thinking and sometimes aphasia. Complex partial seizures generally ended with generalized convulsions. Flaubert also showed a personality structure that under many aspects coincided with that of patients with temporal focal epilepsy. Over the years his interest for sex considerably decreased (hyposexuality). He had become very impulsive and had developed a morbid devotion to writing. In the last few years he showed considerably slow ideation. Moreover, he exhibited significant word-finding difficulties or difficulties in recalling life events ("*Je souis souvent plusieurs heures à chercher un mot*"; cf. Gastaut & Gastaut 1982, p. 487). According to his brother who was a physician (Achille Flaubert), Gustave suffered from "larvate epilepsy" which corresponds to today's psychomotor epilepsy. Gastaut & Gastaut (1982) accurately studied the neurological



Gustave Flaubert (1821-1880).

symptomatology showed by G. Flaubert and suggested a diagnosis of partial epilepsy with an epileptic focus localized in the left occipito-temporal lobe.

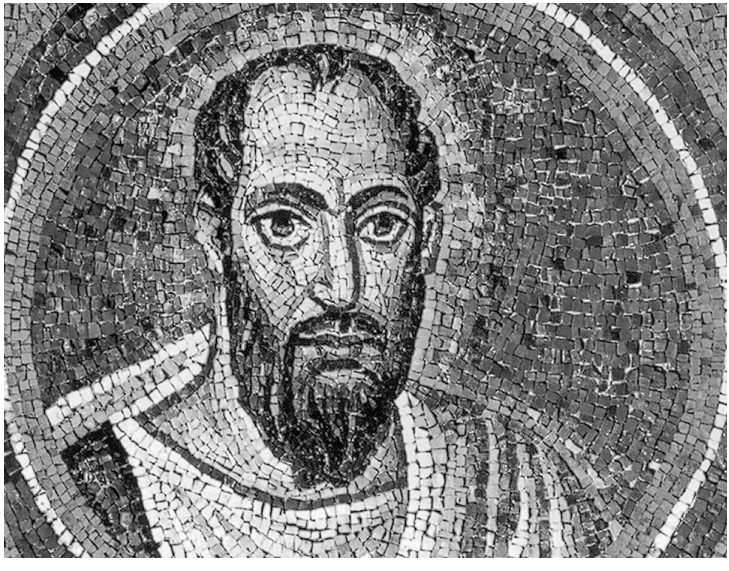
Jeanne D'Arc. In her short life, Jeanne D'Arc (1412-1431) never showed generalized convulsive seizures; however, the different symptoms she displayed are in line with the hypothesis of a temporal lobe epilepsy (Foote-Smith & Bayne 1991). The complex visual and auditory hallucinations with God talking to her and asking her to rid France of English usurpers may be considered as actual phenomena of epileptic aura. Jeanne D'Arc had "visions" at the age of 13, and very often hallucinations were elicited by the sound of church bells (reflex musicogenic epilepsy). Apart from hallucinations and her mystic-military mission, Jeanne D'Arc was described as modest, sensible and without evident psychopathological alterations. However, she showed some personality traits typical of patients with complex partial seizures. She was well aware of being predestined to an important task, and in carrying it out she showed excitation, euphoria and elation. She did not show any interest for sex (hyposexuality) in her life. Under some circumstances related to her military campaigns she showed considerable impulsiveness and aggressiveness.

St. Paul. In his letters St. Paul often mentioned he suffered from a chronic disease, despite which he carried out his mission as Christ's apostle. Some of his writings seem to suggest that he was affected with epilepsy. "I was given a thorn in the flesh, an angel of Satan to rack me and keep me from being puffed up" (2 Corinthians 12,7). "You did not scoff at me nor spurn me" (Galatians 4, 14). In ancient times, the expression "torn in the flesh" was used as synonym for epilepsy; in the same way, to "spurn" or "reject" (Galatians 4, 14) is a translation of the verb whose literary meaning is "to spit out at", hence "you did not spit out at me". Epilepsy was sometimes called "*morbus qui sputatur*" because during seizures patients often spat as superstitious reaction (cf. Landsborough 1987). In St. Paul's letters and in the Acts many episodes of his life are reported which could be interpreted as "critical" phenomena of psychomotor seizures. The following are verses of the New Testament which could refer to auras: "I simply know that in the body or out of the body (God knows which)

this man was caught up to paradise and heard sacred secrets which no human lips can repeat" (2 Corinthians 12,3-4). In different episodes of "ekstasia" St. Paul saw and spoke to Jesus (Acts 16,9; 18,9; 22,17-21). On the way to Damascus he suddenly saw a light and heard Jesus calling him (Acts 9,3-9). On the same occasion, he fell to ground (motor symptom) and after this episode he remained completely blind for three years (post-ictal blindness). Also, St. Paul's personality shows many traits (inter-ictal state) peculiar to patients with psychomotor seizures. Among these, his sudden religious conversion, his great interest for religious or moral issues, hypergraphia, his poor interest for sex (hyposexuality). Furthermore, it seems that he had production difficulties (2 Corinthinians 10,10). This symptom is often reported in patients with left hemisphere focal epilepsy.

Material and Method. Fyodor Mikhailovitch Dostoevsky was born in 1821 and died in 1881. What is most certainly known about his medical history is that he suffered from epilepsy. He was examined and treated by many physicians in Russia and abroad (Trousseau in Paris, Romberg in Berlin and probably even Herpin, one of the most renowned epileptologists of the time). However, it seems that he was never regularly treated for epilepsy (cf. Voskuil 1983, p. 665; Dostoevskaja 1991, p. 49).

To identify all possible factors associated with epilepsy, I read the following works by Dostoevky: *Poor Folk* (1846), *The Double* (1846), *The white nights* (1948) *Uncle's Dream* (1859), *The House of Dead* (1861), *The Insulted and Injured* (1862), *Notes from the Underground* (1864), *The Gambler* (1865), *Crime and Punishment* (1866), *The Eternal Husband*



St. Paul (I C.E.).

(1869), *The Idiot* (1868-1869), *The Devils* (1871-1872), *The Adolescent* (1875), *The Brothers Karamazov* (1879-1880).

All factors in line with a condition of epilepsy were classified as follows: 1) onset of epilepsy, 2) auras (in its various manifestations), 3) cry, 4) automatisms, 5) description of seizures, 6) post-ictal symptoms, 7) triggering factors, 8) interictal features. For each of these points, an excerpt of the novel, a short summary or a reference will be provided.

Results

First attack and frequency of seizures. It is not clear when Dostoevsky's seizures began. Most of his biographers admit that he suffered his first fit when he was 7 years old (Alajounine 1963). In his life Dostoevsky experienced different types of convulsive seizures as he himself admitted in a letter to his brother "I have all sorts of attacks …" (1865); probably he believed that the onset of epilepsy was concurrent with the first generalized convulsive seizure he experienced in waking state in public. This happened in January 1846 in the presence of his friend Grigorowitch. It is therefore possible that before 1846 Dostoevsky had already suffered many psychomotor seizures but these were never considered real epileptic fits as they were not associated with generalized convulsive seizures. The first generalized convulsive seizures which Dostoevsky experienced and which were seen by a physician (Dr. Janowsky) occurred between 1846 and 1849 (Voskuil 1983). The definitive diagnosis of epilepsy was made in February 1857 following some severe seizures a few days after his first marriage (Voskuil 1983, p. 660).

Since the first generalized seizures occurred, Dostoevsky experienced 2 of them a day up to a seizure every four months, with an average of one seizure at a month in the following 35 years. In 1861 Dostoevsky had an episode of status epilepticus. The frequency of fits greatly increased between 1860 and 1870. While he was writing *The Devils* (1870) he experienced many fits. In that period he also showed marked difficulties with his declarative memory, he could no longer recognize people he knew and often he had to read again what he had written as he could not remember what was happening in the novel (Voskuil 1983). Seizures gradually decreased after 1875 until complete disappearance in his last 4 years of life (Geschwind 1984). Most of his fits occurred in the first part of sleep. As Dostoevsky used to go to bed very late (towards 2-3 in the morning), they usually occurred at around 4 o'-clock in the morning (cf. Gastaut 1979). He had four children (two sons and two daughters), one of his sons (Alexis) died at the age of 2 years and 9 months (1878) owing to a status epilepticus which lasted about 5 hours (Dostoevskaja 1991).

Auras. One of the major difficulties arising from the definition of Dostoevsky's epilepsy is the presence of an aura preceding generalized seizures. Almost all neurologists who studied Dostoevsky's epilepsy agree on the

hypothesis that his epilepsy was preceded by an aura (Alajounine 1963; Geshwind 1972; Voskuil 1983). Of a different opinion is Gastaut (1983) who claimed that the famous "aura" of ecstasy was a poetic and mystical expression of his deep aspiration for a world of bliss and Christian love (p. 193). In his novels Dostoevsky described many characters who experienced psychomotor seizures with different types of aura. There are indeed excellent descriptions of auras with ecstasy, auras with fear and terror (cf. *Poor folk*, Chapter II; *The insulted and Injured*, Part I, Chapter X and Part II, Chapter I), *phenomena of déjà vu* or *jamais vu* (cf. *The Instead and Injured*, Part I, Chapter X; *The Idiot*, I, V; *The Adolescent*, Part II, Chapter IX) and auras with autoscopic phenomena (*vision spéculaire, Doppelgänger*). Subsequent neurological studies confirmed the hypothesis that these phenomena were associated with psychomotor seizures. Of particular importance is the fact that Dostoevsky described some of these symptoms associating them with epilepsy when neuroscience had not yet recognized them as such (cf. Gataut 1977). This is a clear indication of the fact that in his novels he reported autobiographical experiences.

Ecstatic aura. In his life, Dostoevsky described his auras to at least three people: Sofia Kovalevskaja, Strakhov, and Baron Wrangel (cf. Gastaut 1979; Voskuil 1983). In her "*Childhood Recollections*" Kovalenskaja (*Vospominanija i pis'ma*. Moskva 1961, p. 105-106) reported a conversation that she and her sister had with Dostoevsky, in 1885, during which he described one of the fits he had experienced when he was prisoner in Siberia (between 1854 and 1857) and unexpectedly was visited by an old friend. They spent the whole evening together discussing philosophical and religious issues. Suddenly, during the discussion, Dostoevsky excitedly shouted: "God exists, He exists…". At the same moment, the bells of the neighboring church began to toll to announce the first Easter Mass. Dostoevsky went on to say " The air was filled with a big noise and I tried to move. I felt the heaven was going down upon the earth and that it had engulfed me. I have really touched God. He came into me myself, yes God exists, I cried, and I don't remember anything else. You all, healthy people, he said, can't imagine that happiness which we epileptics fell during the second before our fit. Mahomet, in his Koran, said he had seen Paradise and had gone into it. All these stupid clever men are quite sure that he was a liar and a charlatan. But no, he did not lie, he really had been in Paradise during an attack of epilepsy; he was a victim of this disease like I was. I don't know if this felicity lasts for seconds, hours or months, but believe me, for all the joys that may bring, I would not exchange this one" (cf. Alajouanine 1963, p. 212). In a direct declaration Dostoevsky (*Biografija, pis'ma i zametki iz zapisnoj knizki F.M. Dostoevskogo*, Sankt-Petersburg 1883, p. 214) described his auras using these

words: "During a few moments I feel such happiness that is impossible to realize at other times, and other people cannot imagine it. I feel a complete harmony within myself and in the world, and this feeling is so strong and so sweet that for a few seconds of this enjoyment one would readily exchange ten years of one's life – perhaps even one's whole life" (cf. Alajouanine 1963, p. 212).

"... and how many dreams I made when I was young, how many experiences I felt with my whole heart and soul during those golden and passionate fevers, as if I had been under opium! Those were the fullest, most sacred and purest moments of my life" (Petersburg's dreams in verses and prose, 1861). This autobiographical account is very important as it suggests that Dostoevsky started to experience auras already in his late childhood and sometimes auras were accompanied by ecstasy. Only after the age of 20, he started to show secondary generalization phenomena. The novelist compared the ecstasy he experienced in adolescence with the effects of opium which he sometimes took as drug (cf. Voskuil 1983, p. 661). "For that very thing had happened. He *had* had time to say to himself at the particular second that, for the infinite happiness he had felt in it, it might be well worth the whole of his life. «At that moment», he had once told Ragozhin in Moscow during their meetings there, "at that moment the extraordinary saying that *there shall be time no longer* [Apocalypse 10,6] becomes, somehow, comprehensible to me. I suppose", he added, smiling, "this is the very second in which there was not time enough for the water from the pitcher of the epileptic Mahomet to spill, while he had plenty of time in that very second to behold all the dwellings of Allah" (*The Idiot*, II, V).

"There are seconds, they come only five or six at a time, and you suddenly feel the presence of eternal harmony, fully achieved. It is nothing earthly; not that it's heavenly, but man cannot endure it in his earthly state. One must change physically or die. The feeling is clear and undisputable. As if you suddenly sense the whole of nature and suddenly say: yes, this is true. God, when he was creating the world, said at the end of each day of creation: «Yes, this is true, this is good». This... this is not tenderheartedness, but simply joy. You don't forgive anything, because there's no longer anything to forgive. You don't really love – oh, what is here is higher than love! What's most frightening is that it's so terribly clear, and there's such joy. If it were longer than five seconds – the soul couldn't endure it and would vanish. In those five seconds I live my life through, and for them I would give my whole life, because it's worth it. To endure ten seconds one would have to change physically" (*Demons*, 1871, III, Chapter V).

The aura characterized by ecstasy is rarely described in the literature. Until 1980 no detailed account of a case of partial complex epilepsy with ecstasic aura had been provided (Alajouanine 1963; Cirignotta et al. 1980). For this reason, in an article of 1977 Gastaut erroneously claimed that au-

ra with ecstasy was a poetic invention of the novelist. Lack of descriptions of ecstatic auras at the time of Dostoevsky, together with the existence of this symptomatology, is a strong indication of the fact that the novelist described this phenomenon on the basis of his personal experiences.

Auras with autoscopic phenomena. Autoscopy is a complex psychosensory hallucination that consists in seeing oneself projected in the external visual space (Frederiks 1985). Most of the times it consists in the mirror-like image of oneself (*vision spéculaire)*. The image may appear in front of the patient, at a certain distance, or in one of the two visual fields. Generally it appears for a short period of time (some seconds), and more rarely do permanent autoscopic phenomena occur. At other times the patient may intensively perceive a presence close to him/her (a guardian angel, a helper, a hostile presence, a *Doppelgänger* cf. Brugger et al. 1996). Generally, the patient experiences the presence of the *Doppelgänger* with surprise and negative feelings (anxiety, loathing, fear). Sometimes the patient thinks he/she is his/her own *Doppelgänger* (out-of-the body experience, cf. Vulleumier et al. 1997). The most frequent cause of autoscopy is an aura due to focal epilepsy.

The phenomenon of autoscopy, in its various forms (perception of a presence, mirror-like image of the *Doppelgänger*), was used by Dostoevsky in his novels from 1846 to 1880 (cf. *Poor Folk*, The Letter; September 13th; *The Double*, Chapter V and VI; *Crime and Punishment*, Part VI, Chapter I; *Demons*, Appendix, I; *The Karamazov Brothers*, Part IV, Book XI and IX). As experienced by patients with focal epilepsy, in Dostoevsky's short stories autoscopic phenomena are associated with astonishment, fear, anxiety and loathing. On many occasions, the characters described by the novelist immediately after he experienced autoscopic phenomena showed loss of consciousness. This is indicative of the presence of secondary generalization of partial complex seizures characterized by auras. Moreover, this association tends to exclude other causes of autoscopy (fever, alcoholism, migraine). Only on one occasion did the author state the side in which the "*Doppelgänger*" appeared, and this was the right side (*The Double*, 1846, VI). This lateralization is in line with findings in the literature that report a higher frequency of autoscopic phenomena in the right visual field (Brugger et al. 1996). The high frequency and the exactness with which autoscopic phenomena are described in Dostoevsky's novels, in a period in which neurology knew little of this phenomenon, lead to think that Dostoevsky described this phenomenon on the basis of his personal experiences rather than pure literary invention (Lhermitte 1951).

The cry. Epileptic generalized seizures occurring during waking state sometimes were preceded by a cry which was repeatedly described by both Dostoevsky's second wife and his friends. It was a protracted and in-

human cry, like a howl, and immediately after it the author experienced a generalized convulsive seizure. This "inhuman" vocalization could be the cry that frequently accompanies the first phase of a generalized tonic-clonic seizure or it could be a symptom typical of frontal epilepsy (Alajounine, 1963, p. 211; Laskowitz 1995). The description of the cry found in Dostoevsky's novels seems to suggest that it was a symptom of psychomotor seizures (frontal epilepsy) as during its vocalization the main character seemed to be still conscious and capable of hearing it (cf. *The Insulted and Injured*, Part II, Chapter VI; Part IV, Chapter IX; *The Idiot*, II, V; *Demons*, III; *The Brothers Karamazov*, Part II, Book V, VII).

Automatisms. Automatisms are frequent components of psychomotor seizures. They follow phenomena of aura and may be simple or complex. During complex automatisms the patient may still perform complex activities (such as walking, driving, reading, etc.) or make inappropriate actions. Automatisms generally occur in the absence of contact with reality. For this reason, after seizures patients do not remember what happened. The automatisms described by Dostoevsky are of complex type and are characterized by the subject's lack of awareness of what happened (cf. *Demons*, I, cap. II and III). If automatisms described in his novels are of autobiographical nature, this would suggest that the author was probably affected by left hemisphere focal epilepsy (Ebner et al. 1994).

Description of seizures. In his novels Dostoevsky reported many epileptic fits and all seemed to be due to only one type of epilepsy, that is psychomotor seizures (partial complex epilepsy) with secondary generalization (cf. *The Idiot*, II, V; *The Adolescent*, Part I; *The Brothers Karamazov*, Part I, Book III, VI). The following are the symptoms of psychomotor seizures reported by the author: 1) different types of aura (phenomena of which the author was aware); 2) secondary tonic-clonic generalization (of which the author was not aware; Dostoevsky's descriptions depend on other people's descriptions or on articles and books on epilepsy); 3) post-ictal period, of which the author was partially aware. As in the case of complex partial seizures, some fits were characterized by subjective phenomena of aura without secondary generalization. Dostoevsky also described some cases of incoming epileptic fits (status epilepticus; cf. *The Brothers Karamazov*, Part II, Book V, VI). It is known that he suffered such an attack at least once in 1861 (Voskuil 1983, p. 661).

Post-ictal symtoms. Often Dostoevsky and Anna Griogor'evna described the speaking and writing difficulties he showed after convulsions, which could last for some hours (cf. *The Insulted and Injured*; Part IV, Chapter I; *The Gambler*, XVI). In this regard, Dostoevsky said: "I was a long time before I could speak", and "When writing I still made mistakes with the words" (Alajounine 1963, p. 211). At the clinical level, this would provide evidence for focal epilepsy, with the

focus being localized in the left cerebral hemisphere. Another type of post-ictal symptoms were automatisms. After a generalized seizure on April 8, 1855 he said "... [I was] completely unconscious, after I got up from the floor, I was sitting and rolling cigarettes one after another. I had made four, but very badly". In May 1870 he wrote "After regaining consciousness, I was a long time before my head became clear and I remember that I was going here and there in the hotel talking about my attack to the people I met" (Alajounine 1963, p. 211). A very unpleasant consequence of his seizures was depression which followed some days after the attack. He could not write nor do anything else. Another disorder due to seizures was a "weakening" of his memory (Dostoevskaja 1991).

Triggering factors. Dostoevsky's second wife remembers that factors triggering epileptic fits were above all concerns and grief (Dostoevskaja 1991). Two convulsive seizures were triggered by drugs or when drinking. Just after his marriage with Anna G. (February 1867) he experienced several fits after many evenings of dining with champagne. On April 8, 1875 an hour and a half before the seizure he took 40 drops of opii banzoedi with water (cf. Voskuil 1983, pp. 660-661).

Interictal features. In his paper on Dovstoevsky's epilepsy, Geschwind summarized and discussed the many personality features that are known to be common among patients with temporal lobe epilepsy. As has already been said, one of the most frequent characteristics is the great interest for philosophical and religious issues, together with a great emphasis on morality. These characteristics were present both in Dostoevsky's daily life and in most of his novels. Another personality feature of the novelist was his lack of humor and the lack of concern with sex or female beauty. "His daughter pointed out in her biography that she found it astonishing that in his youth there was no woman in his life – no betrothed, no mistress, not even a filtration" (Geschwind 1972, p. 331). Lack of humor and hyposexuality are well-known common personality traits in temporal lobe epilepsy. Dostoevsky showed two other traits typical of patients with TLE: hypergraphia and the tendency to fill pages with complex and repetitive drawings (Robert et al. 1982; Murai et al. 1998), Figure 1.

Figure 1.

Like many other patients with TLE (cf. Robert et al. 1982), Dostoevsky showed an obsessive personality with a tendency to precision, order and details, as recalled by Anna G. "The items on his desk were always placed in a rigorous order, the writer did not tolerate the slightest sign of mess" (Dostoevskaja 1991, p. 140).

Conclusions. In his paper of 1983 (p. 664), Voskuil clearly and effectively described the most salient features of Dostoevsky's epilepsy: (a) "a little breeze"; (b) ecstatic aura; (c) expressive dysphasia (once described before an attack); (d) pallor; (e) adversive movements of the head; (f) symptoms of fear; (g) a cry; (h) generalized convulsive movements; (i) long-lasting confused states with automatisms, speaking and writing disorders, and post-ictal depression; and (j) increasing disturbances of memory functions. Given this symptomatology, Alajouanine (1963) was the first to suggest that Dostoevsky suffered left temporal lobe epilepsy. He drew this conclusion on the basis of the aura characterized by fear or ecstatic phenomena typical of TLE and the presence of speech disorders which followed some attacks. These language deficits indicate an involvement of the left temporal lobe. A similar conclusion was drawn by Geschwind (1972) who, however, did not suggest which of the two brain hemispheres was affected: "It seems that one must diagnose Dostoevsky as a sufferer from temporal lobe epilepsy" (p. 330).

In contrast, in a paper of 1977 Gastaut claimed that Dostoevsky did not show focal epilepsy but Primary Generalized Epilepsy. In his diagnostic hypothesis he dwelled above all on the fact that until then no one had provided a clear description of temporal epilepsy with ecstatic aura and, therefore, the aura with ecstasy described by the novelist was only a poetic invention (pp. 193-196). Some years later, Cirignotta et al. (1980) reported for the first time ever a case of temporal lobe epilepsy with ecstatic seizures which they suggested calling "Dostoevsky epilepsy". Dostoevsky's description of a symptom which at the time was still unknown in the literature strongly points to the fact that the ecstatic aura he experienced was a genuine symptom of epilepsy. Some years later Voskuil (1983) drew the conclusion that Dostoevsky suffered from partial complex epilepsy with a majority of secondary generalized nocturnal attacks (p. 665).

In my opinion, Dostoevsky's epileptic symptomatology allows to hypothesize that the novelist had a focal epilepsy localized in the frontal lobe (with involvement of the anterior cingulate gyrus) with a tendency to secondary generalization (cf. Lebrun & Fabbro 2002). Frontal lobe focal epileptic fits tend to: (1) occur in sleep; (2) trigger auras with emotional components (intense fear); (3) produce vocalizations; (4) determine post-ictal aphasia; and (5) tend frequently to generalize into secondary tonic-clonic epilepsy (Laskowitz 1995). The presence of language disorders and depression following convulsions supports the hypothesis of an epileptic focus localized in the left cerebral hemisphere (Robert et al. 1982; Paradiso et al. 1995).

It cannot be naively stated that Dostoevsky's epilepsy was the only source for his creativity and literary genius. At present, in Europe and North America there are millions of people who suffer a similar type of epilepsy (temporal or frontal epilepsy) but among these there are few successful novelists and, unfortunately, no one has the same literary genius as Dostoevsky. It must be nonetheless stated that Dostoevsky's disease was not a simple chronic disease. Psychomotor seizures affect the organ responsible for cognitive and affective functions and language. Furthermore, this type of epilepsy, with its subcontinuous activity, tends to intensify some personality traits, such as philosophical and religious reflections, meticulousness, hypergraphia, lack of interest for sex, etc. Dostoevsky, therefore, suffered from a disease that first of all had contributed to shaping his personality and stressing some traits which had influenced his written production.

A central question is why Dostoevsky introduced the issue of epilepsy in almost all his novels, whereas Flaubert, for example, – who suffered from the same disease – wrote less about it (even if Emma, the main character of *Madame Bovary* suffered from convulsive seizures, Part II, XII). In describing epilepsy, Dostoevsky probably had two objectives in mind. The first goal was to re-state that people suffering from epilepsy were not monsters. Not only ordinary people but also literary critics and political opponents had used this disease to denigrate him and he had had to defend himself stressing the fact that to discredit someone just because he/she was affected by epilepsy was unfair and mean. For example, in 1864 in the journal "*Epocha*" he replied to some attacks with a short paper entitled *A Necessary Statement*. "Yes, I suffer from epilepsy which, unfortunately, I happened to develop twelve years ago at a sad time in my life. The disease is not a cause of disrepute (…). But epilepsy is not a hindrance to activity. There have been many great personalities suffering from epilepsy and one of them even revolutionized the world, despite his disease. What meanness you show" (cf. Strada 1994, p. XVII).

Dostoevky's second objective was even more ambitious: not only people with epilepsy are like others but they show greater qualities in terms of cognition, philosophical and religious aspects than normal people. It is not by chance that the main character of The Idiot, Prince Myshkin, who takes inspiration from the greatest religious figure of the Western world, Jesus Christ, was affected by epilepsy. During convulsions, Prince Myshkin like Christ fully understood the sense of universe and time. The idea that a disease, and particularly, psychomotor seizures, are a way to deeper knowledge is not only typical of Dostoevsky but is found in many cultures, where individuals wanting to become a shaman, that is man of knowledge, must experience a period of both disease and ecstasy (Eliade 1964; Kalweit 1992). These experiences allow man to establish contact with the complex reality that is beyond normal life. This is also reflected in the ancient definition of epilepsy as "sacred disease".

References/ Bibliografie

Alajouanine T. (1963). Dostojewski's epilepsy. *Brain*, 86: 209-218.

Bear D.M. (1979). Temporal lobe epilepsy – a syndrome of sensory-limbic hyperconnectivity. *Cortex*, 15: 357-384.

Bear D.M., Fedio P. (1977). Quantitative analysis of interictal behavior in temporal lobe epilepsy. *Archives of Neurology*, 34: 454-467.

Bear D., Levin K., Blumer D., Chetham D., Ryder J. (1982). Interictal behaviour in hospitalised temporal lobe epileptics: Relationship to idiopathic psychiatric syndromes. *Journal of Neurology, Neurosurgery, and Psychiatry*, 45: 481-488.

Bergin P.S., Thompson P.J., Fish D.R., Shorvon S.D. (1995). The effect of seizures on memory for recently learned material. *Neurology*, 45: 236-240.

Brugger P., Regard M., Landis T. (1996). Unilaterally felt "Presences": The neuropsychiatry of one's invisible Doppelgänger. *Neuropsychiatry, Neuropsychology, and Behavioral Neurology*, 9: 114-122.

Dostoevskaja Anna G. (1991). *Dostoevskij mio marito*. Milano: Bompiani.

Cirignotta F., Todesco C.V., Lugaresi E. (1980). Temporal lobe epilepsy with ecstatic seizures (so-called Dostoevsky epilepsy). *Epilepsia*, 21: 705-710.

Collins R.C. (1987). Epilepsy: Insights into higher brain functions in humans. In V.B. Mountcastle (Ed) *The Nervous System. Higher Functions of the Brain*. Bethesda: American Physiological Society, vol. V, pp. 811-841.

Ebner A., Dinner D.S., Noachtar S., Lüders H.O. (1995). Automatisms with preserved responsiveness: A lateralized sign in psychomotor seizures. *Neurology*, 45: 61-64.

Eliade M. (1964). *Shamanism: Archaic Techniques of Ecstasy*. New York: Pantheon.

Foote-Smith E., Bayne L. (1991). Joan of Arc. *Epilepsia*, 32: 810-815.

Frederiks J.A.M. (1985). Disorders of the body schema. In Frederiks J.A.M. (Ed) *Handbook of Clinical Neurology*. Amsterdam: Elsevier, vol. 45, pp. 373-393.

Gambardella A., Gotman J., Cendes F., Adermann F. (1995). The relation of spike foci and of clinical seizure charateristics to different patterns of mesial temporal atrophy. *Arch. Neurol.*, 52: 287-293.

Gastaut H. (1956). La maladie de Vincent van Gogh envisagée a la lumière des conceptions nouvelles sur l'épilepsie psychomotrice. *Ann. Méd.-Psych.*, 114: 198-238.

Gastaut H. (1977). Fyodor Mikhailvilovitch Dostoevsky's involuntary contribution to the symptomatology and prognosis of epilepsy. *Epilepsia*, 19: 186-201.

Gastaut H., Gastaut Y. (1982). La malatie de Gustav Flaubert. *Rev. Neurol.* (Paris), 138: 467-492.

Geschwind N. (1972). Dostoievsky's epilepsy. In Blumer D. (Ed) *Psychiatric aspects of epilepsy*. Washington D.C.: American Psychiatric Press (1984), pp. 325-334.

Geschwind N. (1983). Pathogenesis of behavior change in temporal lobe epilepsy. In Ward A.A., Penry J.K., Purpura D. (Eds) *Epilepsy*. New York: Raven Press, pp. 355-370.

Gloor P., Olivier A., Quesney L.F., Andermann F., Horowitz S. (1982). The role of the limbic system in experiential phenomena of temporal lobe epilepsy. *Annals of Neurology*, 12: 129-144.

Kalweit H. (1992). *Shamans, Healers, and Medicine Men*. Boston: Shambhala.

Landsborough D. (1987). St Paul and temporal lobe epilepsy. *Journal of Neurology, Neurosurgery and Psychiatry*, 50: 659-664.

Laskowitz D.T., Sperling M.R., French J.A., O'Connor M.J. (1995). The syndrome of frontal lobe epilepsy: Charateristics and management. *Neurology*, 45: 780-787.

Lhermitte J. (1951). Visual hallucinations of the self. *British Medical Journal*, 1: 431-434.
Lebrun Y., Fabbro F. (2002). *Language and Epilepsy*. London: Whurr.
Murai T., Hanakawa T., Sengoku A., Ban T., Yoneda Y., Fujita H., Fujita N. (1998). Temporal lobe epilepsy of natural history. *Neurology*, 50: 1373-1376.
Paradiso S., Hermann B.P., Robinson R.G. (1955). The heterogenety of temporal lobe epilepsy. *Neurology, Neuropsychology, and Psychiatry. J. Nerv. Ment. Dis*., 183: 538-547.
Roberts J., Robertson M.M., Trimble M.R. (1982). The lateralising significance of hypergraphia in temporal lobe epilepsy. *Journal of Neurology, Neurosurgery, and Psychiatry,* 45: 131-138.
Van Vugt P.H.E., Deschepper A.M.M., Creten W., Flower L. Stendhal D. (1783-1842). Suffer from a temporal lobe epilepsy (manuscript unpublished).
Voskuil P.H.A. (1983). The epilepsy of Fyodor Mikhailovitch Doestoevsky (1821-1881). *Epilepsia*, 24: 658-667.
Vuilleumier P., Despland P.A., Assal G., Regli F. (1997). Voyages astraux et hors du corps. Hèautoscopie, extase et hallucinations expérientielles d'origine épileptique. *Rev. Neurol.* (Paris), 153: 115-119.
Schulz R., Lüders H.O., Noachtar S., May T., Sakamoto A., Holthausen H., Wolf P. (1995). Amnesia of the epileptic aura. *Neurology*, 45: 231-235.
Strada V (1994). Il Santo idiota e il savio peccatore. In Dostoevsky F. *L'idiota*. Torino: Einaudi.