THE HUMAN FACTOR IN FLIGHT AND THE QUESTION OF SATISFACTION

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Satisfaction as human factor

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THE BEGINNINGS OF THE PSYCHOLOGY OF FLIGHT

Aviation medicine has always shown, from its beginnings right up to the present time, great attention to the human factor.

With regard to its beginnings, I would refer to the interesting and authoritative publication by A. Gemelli, “La psicologia del pilota di velivolo” (1942) [1], which, besides offering several relevant facts, also confirms the exceptional stature of the Author.

Gemelli (1878-1959) was a brilliant mind whose major contribution could be summarised by his introduction of psychology (scientific psychology) between the 19th and 20th Century [2], in various fields of cultural and social life: from Academia to theology, from the Air Force to any workplace, both nationally and internationally.

L.P. Salvatori defines Gemelli «the father of the Human Factor» (1995) [3] above all for having introduced the concept of applied psychology, first in the Air Force, then in other workplaces. Gemelli’s first studies on the

1 M. Genga, Una parola sulla psicologia scientifica, in: Pensare con Freud, edited by G.M. Genga and M.G. Pediconi, Sic Edizioni, 3rd and enlarged edition, Milan, 2008. Amongst this material there are two pieces, one by W. James and one by W. Wundt. In both these pieces these pioneers of experimental psychology question the statute (today one would say epistemological statute) of the science which they were constructing in the USA and Europe.

Titolo breve
Soddisfazione come fattore umano

Parole chiave
Soddisfazione, motivazione, fattore umano

GLI INIZI DELLA PSICOLOGIA DEL VOLO

La medicina aeronautica ha sempre riservato, dai suoi inizi fino ai giorni nostri, grande attenzione al fattore umano.


Con ragione, L.P. Salvatori definisce Gemelli «il padre dello Human Factor» (1995) [3], anzitutto per avere introdotto il concetto di psicotecnica, prima in aeronautica, poi nel mondo del lavoro. I primi studi di Gemelli sul

human factor appeared in 1915, while the 1942 volume brings together and concludes his research of almost thirty years. This volume demonstrates the solid work of a scientist of his time, intent on determining and enunciating laws capable of explaining the phenomena which he himself had gathered, with the intention of completing the picture of the psychology of the aviation pilot. Psychology is in fact the science of the laws of behavior and human activity. The scientific categories in which he worked represent, in my opinion, a singular weave, in accordance with other English and German scholars, who were his contemporaries. At the same time, he also uses the legal concept of sanction 2.

Returning to the present, the checklist of the Flight Safety Foundation investigates the motivations correlating to the human factor in flying accidents, examining accidents in civil aviation [4]. The items of this list are

2 «The affective processes exert in life the function of guide, of auxiliaries, of action sanctions» (Gemelli, page 152). With regard to pilot’s neurosis, Gemelli recognized the ultimate root of this morbid form with research into conflict: «whoever does not recognize this must renounce giving himself reason about the origin of neurosis (…) To have brought this to light is without doubt Freud’s great merit» (Gemelli, page 216). Our translation. In the description of some clinical summaries, he proceeds with an accuracy and a wealth of details which brings to mind the expository style of the founder of psychoanalysis, for example in his clinical cases, which Freud denominated Kranken Geschichten: stories of sick people.

fattore umano risalgono al 1915, mentre il volume del 1942 raccoglie e conclude la sua ricerca quasi trentennale. Questa opera mostra il solido impianto di un uomo di scienza di quei tempi, tutto proteso ad individuare ed enunciare le leggi capaci di spiegare quei fenomeni che egli stesso raccoglie, con l’intento di completare il quadro della psicologia del pilota di aviazione. La psicologia è infatti scienza delle leggi del comportamento e delle attività umane. Le categorie scientifiche di cui egli si serve rappresentano, a mio avviso, un intreccio singolare di più discipline, oggi non più reperibile. Infatti egli, nel descrivere il nesso tra stimoli esterni e risposte ad essi nell’individuo, fa ricorso allo schema azione-reazione (riconducibile all’arco riflesso) in accordo con altri studiosi inglesi e tedeschi suoi contemporanei, ma al tempo stesso usa anche il concetto legale di sanzione»

Venendo ai nostri giorni, la checklist della Flight Safety Foundation indaga le motivazioni relazionali al fattore umano negli incidenti di volo, prendendo in esame gli incidenti occorsi nell’aviazione civile [4]. Gli items che la compongono sono riconducibili a facoltà, funzioni e processi di chiara pertinenza psicologica, quali: sensopercezione, conoscenza, personalità, giudizio e comunicazione nelle relazioni interpersonali. La lista rinvia di fatto a due impianti concettuali, o due psicologie, in realtà non omologhe tra loro: funzioni e facoltà rinviano infatti al principio di causalità aut al principio di imputabilità, su cui tornerò brevemente in seguito.

▶ L’APPORTO DELLA PSICOANALISI: VERSO UN’ACCEZIONE PIU’ AMPIA DELLA NOZIONE DI FATTORE UMANO

La psicoanalisi è una scienza delle facoltà umane, non di funzioni. È un errore diffuso volere riportare Freud sul terreno del determinismo psichico, mentre egli apre la strada ad una nuova scienza dell’uomo. Nelle sue opere, prodotte durante mezzo secolo di attività, vi sono alcuni decisivi brani che testimoniano il suo abbandono del lessico deterministico, che è proprio delle scienze della natura. Ad esempio, nel saggio L’Io e l’Es (1922), egli scrive: «L’analisi non ha certo il compito di rendere impossibili le reazioni morbose, ma piuttosto quello di creare per l’Io del malato la libertà di optare per una soluzione o per l’altra» [5]. Il termine tedesco per libertà è Freiheit, e figura in corsivo nel testo.

2 «I processi affettivi esercitano nella vita una funzione di guida, di ausiliari, di sanzioni dell’azione» (Gemelli, op. cit. pag. 152). Circa le neurosi dei piloti, Gemelli riconosce come la radice ultima di queste forme morbose sia da ricercare nel conflitto: «chi non riconosce questo, deve rinunciare a rendersi ragione della genesi delle neurosi (…) L’aver messo questo in luce è stato senza dubbio il gran merito di Freud» (Gemelli, op. cit. pag. 216). Infine, nella descrizione di alcuni quadri clinici, egli procede con un’accuratezza e una dovizia di particolari che ricorda molto da vicino lo stile espositivo del fondatore della psicoanalisi, ad esempio nei suoi «caso clinici», che egli ha denominato Kranken Geschichten: storie di malati.
ascrivable to faculties, functions and processes of clear psychological pertinence: sense-perception, knowledge, personality, judgment and communication in interpersonal relationships. The list comprises two conceptual systems, or two psychologies, which are in reality not homologous: functions and faculties defers in fact to the principle of causality aut to the principle of imputability, to which I will come back later.

**THE CONTRIBUTION OF PSYCHOANALYSIS. TOWARDS A MORE AMPLE ACCEPTANCE OF THE NOTION OF «HUMAN FACTOR»**

Psychoanalysis is a science of human faculties, not functions. It is a widely diffused mistake to bring Freud onto the field of psychic determinism, while he opens the road to a new science of man. In his works, produced during half a century of activity, there are some decisive passages which give testimony to his abandonment of the deterministic vocabulary, which is really taken from the science of nature. For example, in the essay *The Ego and the Id* (1922) he writes: «Analysis certainly does not have the job to make morbid reactions impossible, but more that of creating for the ego of the ill person the freedom to opt for one solution or another» [5]. The German term for freedom is *Freiheit*, and appears in italics in the paper.

Freud would have liked to have called psychoanalysis simply *psychology*; he did not do it to distinguish it from psychology, which was becoming very popular in those years and was proclaiming its independence from philosophy. It remains true that *psychology* is the name to reserve for a science of the psyche (a Greek word) that is the *soul* (*anima*, Latin word). Psyche, or soul, is nothing but the form of the motion of the human body - here is an unusual but not a new assertion which, I have taken from the teaching of the psychoanalyst Giacomo B. Contri. The human body becomes *animated* from its first instances of life - it happens. Nevertheless let’s think about nutrition, care and treatment a child receives from the moment of its birth. The phrase «By nursing me, my mother excited me to the need to become satisfied via others»


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[6] describes the beginning of the action of thinking (the
Freudian expression is Psychische Realität, psychical re-
ality). In extreme synthesis, body and thought know satisf-
faction, first of all because satisfaction derived from the
very first care, usually maternal care.

Freud called drive (Trieb) this law of motion, com-
pletely distinguishing it from animal instinct (Instinkt).
Each drive is composed of four elements: the push, the
source, the object and the aim. The question of satisfac-
tion is inside these elements and comes from the ego.
The question can be expressed in these terms: «Given
the push, the source and the object, how can I find sat-
faction?». In other words, the search for satisfaction,
unavoidable for everyone, is always derived from the
first excitements received by an individual.

The experience of satisfaction pertains equally to eat-
ing, the use of the sphincters, seeing, hearing, speaking
and even sleeping. All of these seemingly elementary
actions of everyday life are common to every race and
age in the history of man: the human body is always a
driven-body.

Freud is the first thinker who precisely identified intel-
lect or thought and a sex life or sexuality in the child.
Amongst the sources of the latter, he considered it me-
chanical excitements [7]. He examined, for example, the
strong and very common predilection that children have
for games with a passive movement, like the swing and
wanting to be pushed high, or to be cradled and rocked.

Freud also referred to experiences, absolute first
in his time, such as the rhythmic beat of the train roll-
ing over the tracks, which can be heard during a train
journey. Only later, when the whole infantile sexual life
falls under repression, those agreeable sensations felt
by the healthy child become unpleasant and even the
source of anxiety. In some cases causing a phobia about
trains. This also happens in flight. During a flight, the
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I would now use two assertions by G.B. Contri which
summarize most effectively the whole Freudian discov-
ery, in order to introduce some conclusions of a medical-
legal nature:

Man is that point of nature in which nature itself be-
comes a question of satisfaction.
Psychic life is a juridical life.

We can expect that psychopathology manifests itself
and disturbs the flight if and only if that experience was
previously identified by a subject as a positive and pleas-
ant affection. Why does this important change happen?
The positive affection becomes a negative affection and
pleasure is transformed into displeasure or anxiety. A
conflict arises, with the introduction of an experience
which hitherto, in a healthy individual, was not there.
From that moment the subject is divided between op-
posing aims, and his behavior in flight will no longer be
unequivocal nor adequate to the demands of his role or
profession.
In my opinion, psychoanalysis can bring an important contribution to the study and valuation of the different emergencies caused by the psychopathology, as Gemelli recognized in his previously cited work:

1. Psychoanalysis knows how to recognize the underlying conflict of psychic illnesses.

2. Psychoanalysis knows how to treat these illnesses because these are devotional or infringements of normality - normality meant in a juridical and not statistical sense.

► THE JUDGMENT OF TRUSTWORTHINESS WITHIN LEGAL MEDICAL WORK

«The analysis of the human factor consists, in fact, of the study of trustworthiness of man that proceeds side by side with the trustworthiness of the machines» [8]. The criterion of trustworthiness of a subject can point correctly the physician to a psychopathological diagnosis in a legal medicine context more than anything else. I make use of it in listening to the users of the Medico-legal Institute, as well as in typing diagnosis and medical-legal proposals.

In the light of the Freudian doctrine three are the concepts or criteria that enable to distinguish precisely psychic health, or normality, from psychoanalysis:

1) imputability, 2) individual competence, 3) trustworthiness.

With regards to the first two, I shall limit myself to mention them, keeping in mind that the DSM, starting from the 3rd Edition, opens with a very significant editorial note which invites prudence in the use of the Manual, particularly «in juridical work, where for example one should bear in mind individual responsibility, the valuation of disability and imputability» [9]. It can therefore be deduced that the DSM is not an atheoretical diagnostic system as it is believed. In fact, the category of imputability is radically excised.

The judgment of trustworthiness of a subject with whom we are or enter into a relationship with, accompanies every moment and every act in everyday life, even when it does not seem so apparent. On the contrary it is one of the first judgments the thought of a child is able to make. Therefore, trustworthiness can be considered a necessary trait of normality. In Freud’s words «One often judges decisive, in order to evaluate if an aspect of character or a behavior is to be considered morbid, the fact that it provokes damages, damage to individuals or to the community of which the person is a part (...) to the distinction between what is normal and what is morbid we cannot give up for practical reasons (...). In each field of human activity there are great men who respond per-rectly to the requirements of normality» [10]. I would cite two examples, which I have taken from the case histories collected in recent years at the Medico-Legal Institute.

1) A helicopter pilot reported lesions to his spine after a serious accident. He undertook rehabilitation until he was judged capable of flying again from the medical point of view, which invites prudence in the use of the Manual, opens with a very significant editorial note which invites prudence in the use of the Manual, particularly «in juridical work, where for example one should bear in mind individual responsibility, the valuation of disability and imputability» [9]. It can therefore be deduced that the DSM is not an atheoretical diagnostic system as it is believed. In fact, the category of imputability is radically excised.

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«in sede giuridica, ove ad esempio si debba tenere conto di aspetti quali la responsabilità individuale, la valutazione della disabilità e l’imputabilità» [9]. Da ciò si evince che il DSM non è affatto un sistema diagnostico atoetico, come si ritiene: infatti la categoria dell’imputabilità ne è radicalmente espunta.

Il giudizio di affidabilità di un soggetto, con cui siamo o entriamo in relazione, accompagna ogni momento e ogni atto della vita quotidiana, anche quando non viene messo a tema in modo esplicito. Anzi, è tra i primi giudizi di cui è capace il pensiero del bambino. Pertanto l’affidabilità può essere considerata un tratto necessario della normalità. Con le parole di Freud: «Si giudica spesso determinante, per valutare se un aspetto del carattere o un comportamento è da ritenere morboso, il fatto che esso provochi dei danni, danni alla persona singola o alla comunità di cui la persona fa parte. (...) alla distinzione fra ciò che è normale e ciò che è morboso non possiamo rinunciare per motivi pratici (...)». In ogni campo dell’attività umana esistono grandi uomini che rispondono perfettamente ai requisiti della normalità» [10]. Accenno solamente a due esempi che trago dalla casistica raccolta in questi anni presso l’IML:

1) un pilota di elicottero, dopo un grave incivolo, riporta lesioni alla colonna. Esegue la riabilitazione finché, dal punto di vista organico, è giudicato idoneo a riprendere il volo. Ma egli stesso dichiara di rinunciare a volare per prudenza. Infatti la nuova condizione non gli consentirebbe, in caso di una nuova emergenza, di eseguire le necessarie manovre per salvare la vita propria e degli altri componenti dell’equipaggio. Non presenta deflessione dell’umore o altri sintomi depressivi. Ha elaborato in modo soddisfacente il lutto e preferisce venire impiegato come istruttore di volo a terra. Ha ragione.

2) un giovane ufficiale, pilota di aviogetto, dopo il riscontro di un lieve difetto al visus che lo rende non più idoneo a pilotare lo stesso velivolo, non intende essere impiegato nel ruolo di navigatore o pilota dell’aereo di rifornimento in volo. Considera il volo in tutt’altra luce che in passato: troppo rischioso, troppo preoccupazioni per la famiglia che ha appena formato, etc. Non per questo viene giudicato affetto da una patologia psichica. Il difetto di motivazione è il giudizio adeguato, che riflette la tematica oggetto di questo mio contributo: si tratta di soddisfazione.

► IL MERITO DEI FRATELLI WRIGHT

«Gli uomini non voleranno mai perché il volo è riservato agli angeli».

Reverendo Milton Wright (padre dei fratelli Wright). Al Museo della Scienza e della Tecnologia di Milano, all’interno di una bacheca contenente ogive ed eliche, il visitatore può leggere alcuni aforismi di pensatori e scienziati, tra cui quello qui riportato. Chi ha curato l’esposizione ha avuto un’idea brillante: ha segnalato a tutti il merito dei fratelli Wright. Incursi sito, ho consultato Wikipedia. Ed ecco che cosa ho trovato:
of view. The pilot himself declared that he was giving up flying as a precaution. In fact, his new physical condition would not have allowed him, in case of an emergency, to make the necessary maneuvers to save his life, and the lives of the crew. He did not show any deflection of humor or symptoms of depression. He explained in a satisfactory way his grief and preferred to be employed as a ground based flying instructor. He was right.

2) A young jet pilot, after the confirmation of a slight vision defect which left him unable to pilot the same jets, did not want to be employed as a navigator on the same jet or a pilot of re-fuelling aircraft. He considered flying in a totally different light than he had before - too risky, too much worry for his young family, etc. He was not judged as being affected by a psychic pathology. The defect of motivation is an adequate judgment, which reflects the theme of my contribution: it is about satisfaction.

THE MERITS OF THE WRIGHT BROTHERS

“Men will never fly, because flight is the privilege of angels”

Rev. Milton Wright (father of the Wright brothers).

At the Museum of Science and Technology in Milan, in a section containing spinners and propellers, you can read some aphorisms by famous thinkers and scientists, including the one quoted above.

The curator for the exhibition had a brilliant idea: he pointed out the merits of the Wright brothers. Intrigued, I looked it up on Wikipedia, and here is what I found: “Attempts to fly powered airplanes had been made, albeit with almost always disastrous results, some years before their historic venture accomplished on December 17th, 1903. Brothers Orville and Wilbur Wright were able to take off on the beach of Kitty Hawk, North Carolina - keeping their airplane, the Flyer 1, in the air for those twelve seconds that would change the history of flight. This was the first propelled aircraft to be built and the first to be able to fly.

The Wrights owned a bicycle factory. Since 1896 they had been fascinated by the experiments of those scholars who tried to apply a scientific approach to their attempts to fly objects heavier than air (...). During that single morning of December 17th the Flyer 1 flew four times: Orville and Wilbur took turns at the controls. During the first two flights, the airplane, piloted by Orville, flew for about twelve seconds at a height of about three meters and a speed of 7.5 km/h. Shortly after that, Wilbur was able to have a flight time of 59 seconds on a distance of 266 meters».

Fin qui la notizia, che peraltro non apparve subito sui giornali dell’epoca, e che rimase sconosciuta per diverso tempo, ora il «nocciolo», alla luce della citazione riportata.

Quel primo volo a motore è da ascrivere al rapporto che i fratelli Wright intrattennero con il loro padre. Questi, pastore e vescovo metodista, era un intellettuale: possedeva infatti ben due biblioteche, una di teologia...
ing exclusively of theology books, while the second one included many different genres. His son Orville wrote: «We were lucky enough to grow up in a home environment where there was always much encouragement to children to pursue intellectual interests; to investigate whatever aroused their curiosity». Probably Reverend Wright himself had the aspiration to fly; his warning about the flight, «reserved for angels» makes me think that he found himself coming to terms with his theological education. His would be a case of psychological inhibition reinforced and legitimized by his Protestant upbringing.

Certainly the Wright brothers did not stop at the identification with the father figure, and they did not even linger to question it. They simply took a different route, taking up and thus fulfilling their father’s ambition.

And so the airplane was invented. We fly thanks to their enterprise, directed toward the success of what Freud, unique in the history of modernity, a few years later called «paternal complex». The Wrights were really Father & Sons, but with a very different meaning compared to the myth of Daedalus and Icarus, and the opposite to that of the homonymous and legendary song by Cat Stevens (1970), so loved by many including myself, who were fifteen years old at the time.

If it were not for December 17th, 1903, there would be no Lindberg with his Spirit of Saint Louis, no Air Force One, no Top Gun, no Frecce Tricolori, not even Canadair, and l’altra con svariatissimi libri. Il figlio Orville scrisse di «esser stato fortunato a crescere in un ambiente in cui sia lui che il fratello venivano molto incoraggiati a coltivare interessi intellettuali e ad investigare qualsiasi cosa destasse la loro curiosità». Probabilmente lo stesso reverendo Wright nutriva l’aspirazione a volare: il suo monito circa il volo «riservato agli angeli» mi fa pensare che si sia trovato a fare i conti con la propria formazione teologica. Se fosse così, il suo sarebbe un caso di inibizione psicologica rinforzata e legittimata dalla formazione protestante.

Certo i fratelli Wright non si arrestarono all’identificazione con la figura paterna, e neanche si attardarono a contestarlo. Semplicemente presero un’altra strada, raccogliendo e portando a compimento l’ambizione del padre.

E l’aeroplano fu. Noi voliamo grazie alla loro iniziativa, volta al successo di ciò che Freud, unico nella storia della modernità, chiamò in quegli stessi anni «complesso paterno». I Wright sono stati davvero Father & Sons, in un senso assai diverso da quello del mito di Dedalo e Icaro, e opposto a quello dell’omonima e leggendaria canzone di Cat Stevens del 1970, che pure piaceva molto a moltissimi di chi - come me - aveva allora quindici anni.

Senza quel 17 dicembre 1903 non ci sarebbero stati né Lindberg con il suo Spirit of Saint Louis, né l’Air Force One, né i Top Gun o le nostre Frecce Tricolori, ma ne-
or the low cost airline *Ryanair*, used now by millions of people all over the world.

The Wrights must have thought: *ce n’est qu’un début*.

This short excursion shows how the historical challenge of the Flyer 1 is to be understood as a case of success in individual searching for satisfaction that becomes a gain for everyone.

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