Graceful Ageing – Psychiatric Ethical Factors Balancing The Conflict between Happiness and Ageing

Birgit Braun and Thomas H. Loew

Department of Psychosomatic Medicine, University Hospital Regensburg, Franz Josef Strauss Allee 11, D-93053 Regensburg, Germany

KEYWORDS Botulinumtoxin as an Antidepressant. Growing Old. Psychiatry. Ethics. Thanatology

ABSTRACT Strategies of anti-ageing promise eternal youth and necessitate an ethical foundation of this process. With the help of a hypotheses controlled literature research, this descriptive study considers the poles of happiness and death under psychiatric-ethical aspects. In the Western world the association of age and physical deficits is mostly present. Exemplary, the wrinkle treatment represents the immense actual efforts in reducing the deficits accompanying the process of ageing. Actually, Botox as a well-known anti-ageing nerval toxin is also applied as an antidepressant therapy. The authors call for caution at this, because psychiatry, psychosomatics and psychotherapy dispose well-established alternative antidepressive methods like promoting the factor of resilience at an early stage whereby the self-perceived success in ageing can be enhanced. Besides resilience, humour, self-validation and gratitude should be recognised. Further studies are needed for an evaluation of thanatologic interventions in psychotherapy.

INTRODUCTION

Ageing is an on-going process to which all humans are subject to (Wareham 2018). Mental frailty or dementia is a source of fear for many (Higgs and Gilleard 2017). The new era of ageing research has unique medical, commercial as well as societal implications (Campisi et al. 2019). By contrast, there only exists relatively less ethical work concerning the ethics of ageing (Wareham 2018).

Objectives

As the ageing person mostly is treated as an object in ethical discourse rather than as its subject (Wareham 2018), the researchers find it all the more important to focus on psychiatric ethical factors balancing the conflict between happiness and ageing, as there's a graceful ageing.

METHODOLOGY

The present paper is the abbreviated, modified and updated version of a seminar work by Birgit Braun on the topic "Young forever? Ethical issues

Address for correspondence:
Dr. med. Dr. phil. Birgit Braun
Department of Psychosomatic Medicine,
University Hospital Regensburg,
Franz-Josef-Strauß Allee 11,
93053 Regensburg
E-mail: birgit.braun@ukr.de
Telephone: 01704500385

regarding the overcoming of old age" (FAU Erlangen-Nürnberg SS 2016). The study's design consisted of a selective, hypotheses controlled, ("How can we age best?") literature research. A specific literature research was conducted in Pubmed for "botulinum" or "botox" and "antidepressant" or "depression" or "depressive" or "depressed" in June 2016 and in January 2020.

RESULTS

Mankind's Pursuit of Eternal Youth

"Age" as the opposite of "youth" is a vast subject of scientific research with aim to slow down, postpone or paralyse the natural ageing process (Ehnie and Marckmann 2009). David Gems characterised the biogerontological knowledge of ageing since 1954 as "a genuine Gold Rush in the genetics of ageing" (Gems 2009). The anti-ageing market is booming (Kruszynski 2016) despite its pseudoscientific disguise. Only continuous moral reflection by medical scientists can counter a cosmetics industry encouraging the benefit of facelifts. Moreover, it can contribute to the more constructive and conscientious application of biogerontological research findings.

Myths, Mankind's Dreams and Medical Ethics

The desire to conquer gravity, once within the sphere of mythology, has been fulfilled (Schwab and Eigl 1955). The Greek myth of Daedalos

and Icarus may have inspired lots of would-be flight engineers as well as Berthold Brechts (1898-1956) "tailor of Ulm" from 1934 (Brecht 2007). Despite that human beings learned how to fly long ago (Knell and Weber 2009) Daedalos remains a godfather to up-and-coming research scientists (https://www.daidalosnet.de/SDV/ navigation.nsf/(StartUI), OpenAgent; Retrieved on 23 June 2016). Having realised the archaic desire to fly, humans continue to feel an insatiable desire for immortality. Overcoming mortality is a wish as old as mankind itself (Golowin 1998). The desire for immortality and eternal youth remains a primeval human desire, but the "presenile" period of life might be prolonged thanks to biogerontological research (Bergdolt 2008).

Medical Ethics in the Context of Overcoming Old Age

Long ago are the times of rejuvenating potions from alchemists (Goethe 1962), but pseudoscientifically advertised anti-ageing therapies are gaining credibility from biogerontological research and scientific evidence (Hadley et al. 2005). Recent biological and medical researches on senescence explain the ageing process etiologically. It makes the considerable prolongation of human life ever more likely within the not-so-distant future. The "overcoming" of growing old thus becomes a "current" (Holsboer and Schöler 2007) and often discussed topic in biomedical ethics (Ehnie and Marckmann 2009).

Age is seen as a period of life full of deficits entailing worsening physical and mental degradation, even extending to dementia and the need for long-term nursing care (Rentsch and Vollmann 2012).

The topic of "wisdom of old age" appears to be buried under all the negative aspects that age tends to be associated with.

As one would like a long life in good health, justifiably the biogerontological research community focuses on deficits and makes efforts to their relief. But one also needs to proceed keeping the available resources in mind. The tragic Greek hero Icarus may serve as a sobering example of hybris for us. To best help fulfil mankind's desire to conquer the ageing process, a more humble attitude toward creation as such would be warranted (Cranach 2010).

DISCUSSION

Psychiatric-ethical Impulses to Ageing Well

Psychiatrists are intrinsically closely involved in their patients' life stories. Key life periods are subject to behaviour-therapeutic and learning theories. Psychodynamically biographical experiences considered irrelevant or suppressed are analysed without the patient's direct perception. Life experiences, joys as well as fears and worries are written into one's faces. These reveal, with all the expression-related wrinkles, laugh lines, crow's feet, frown lines, and so on, an individual, unique life and reflect one's own unique past.

To detect any lack of facial skin tone, the fashion magazine Madame recently recommended that women in their mid-20s have their faces screened and if so undergo Botox and hyaluronic-acid treatments to fight the ageing process (Kruszynski 2016). Through Botox therapies triggered by concerns about wanting to look younger, both positive and negative "emotional" tracks are flattened out and robbed of their individuality as side effects of Botox-paralysed facial nerves. Visible heights and depths are evened out by nerve poison. With some justification it can be concluded that the patients have refused to deal with their own expressionmarked life and personal identity. A leather bag that becomes smoother after years of use and that has scratches and spots, a patina, reveals how and where it was used. Exactly this patina makes it so close to one. Similarly, one's facial expressions reflect the straight paths one's lives have taken on the one hand, and the curves, corners, and edges on the other. Looking in the mirror triggers associations whose effect one should accept in order to understand ourselves better. Aesthetic-cosmetic Botox applications to smoothen the face can be regarded as a kind of beauty enhancement and pseudoscience.

The use of Botox in neurology is standard therapy for patients with neurological diseases such as blepharospasm, hemifacial spasm, cervical dystonia, writer's cramp or focal spasm (http://www.neurologie.ukw.de/fuer-patienten/ambulante-sprechstunden/botulinumtoxin-therapie.html. Retrieved on 23 June 2016). However, this nerve toxin is also being investigated in psychiatry (Wollmer et al. 2012).

Botox Applications as Anti-depressive Therapy: Psycho-ethical Risks and Side-effects (Psycho oder besser psychiatric?)

Clinicians hope that the Botox-induced paralysis of the muscles of expression, as an indication of a patient's psychomotoric status, will prove to be an option for alleviating depression (Wollmer et al. 2012; Langer 2015). A press release on the Hanover Medical School's website on February 27, 2012 described results from a trial conducted by the Hanover Medical School and the University Psychiatry Basel under the heading "Facing Depression With Botox". Their randomised controlled study with 30 patients showed that "after 6 weeks, the severity of depressive symptoms had dropped by at least half in sixty percent of the patients, an effect that continued to increase until the trial's conclusion 16 weeks later (https://www.mh-hannover.de/46.html?&tx ttnews%5Btt news%5D=2356&cHash=d8e51f 5ade364336eecbe03179838699; Retrieved on 23 June 2016). The study was published by the Journal of Psychiatric Research (Wollmer et al. 2012). The authors were interviewed by Zeit: Wissen and reported that they had relied on the Facial Feedback Hypothesis (FFH) in their investigation, and the FFH claims that emotions such as feeling annoyed, anxious, or sad (all of which are characteristic of depression) can trigger the activation of muscles in the mid-forehead, the "glabellar region" (Ekman et al. 1983). A new hypothesis in botulin therapy for depression is given by Cosio and Campione, that is, insula cortex for modification (Cosio and Campione 2019). Interruption if possible please. Older psychiatry textbooks usually contain many illustrations of individual faces for students of psychiatry to learn about the pathognomic patterns of facial expression in conjunction with certain psychiatric symptoms or diagnoses. Due to recently tightened privacy regulations, however, psychiatry journals and textbooks can no longer publish such highly informative photographs of patients. Thus, examiners are compelled to hone their psychopathological observation skills via direct personal contact with patients by concentrating on their individual expression patterns. By paralysing the expression muscles (one research group's antidepressive therapy approach), psychiatrists run

the risk of eliminating an important tool, which allows retracing a patient's disease course.

This professional-ethical dilemma still is exacerbated. Botox not just immobilises the frown lines in the foreheads of depressed patients, moreover it causes incapacity to decipher negative signals impregnated in other persons' minds. Experiments have demonstrated that trial subjects with a Botox-immobilised forehead line were slower or impaired in working out negative emotional messages (http://www.zeit.de/zeit-wissen/2013/03/koerper-psyche-gefuehlegesundheit/seite-6; Retrieved on 23 June 2016).

Is the "Botox-to-fight-depression" approach in accordance with psychiatric and ethical principles? When their patients experience a crisis it is the psychiatrists' professional obligation to shield them by means of psycho-pharmacotherapy, and to don rose-tinted glasses, so to speak, through which the patient sees the world as less threatening, as if enveloped in bubble-wrap. However, the Botox-induced impregnation of one's mind against negative signals (lasting about four weeks) does not in the researchers' opinion fully conform to moral and medical standards.

Conventional anti-depression pharmacotherapy can easily be adapted according to the patient's clinical presentation and their individual tolerance parameters by taking plasma half-life times into account. On the contrary, Botox deactivates important protective mechanisms of human perception for about four weeks, provided it is not neutralised by an antitoxin.

According to Hawlik et al. (2014), the trial evidence does not confirm unequivocally the reported anti-depressive effect of Botox injections. Blinded, well-designed studies with larger patient cohorts might be necessary. Tötzel and Hajak acknowledge Botox therapy as an off-label curative treatment, but warn against its indiscriminate and widespread administration in the field of psychiatry, they deplore the paucity of convincing data (Tötzel and Hajak 2015). "Curative approaches should only be taken once the indication has been critically assessed with utmost care. In principle, the benefit-risk profile in this new indication must be clarified on an individual basis, a point that applies especially to the potential loss of therapeutic efficacy through neutralising antibody formation" (Parsaik et al. 2016). Stearns et al. (2018)

conclude in their meta-analysis that the reported antidepressant effect of Botox might be limited by lack of a priori hypotheses, limited sample sizes, large gender bias, and significant difficulty in ensuring blinding. The fact that predominantly female patients suffering from partly chronic and treatment resistant unipolar depression experienced a quick, strong and sustained improvement in depressive symptoms after a single glabellar treatment with botulinum toxin (Kruger and Wollmer 2015) screams for an additional psychodynamic diagnosis. It might be, that the females' depression is mainly due to conflicts of self-worth alleviable by a younger face free of wrinkles.

The psychiatrist can alleviate the depressed patient's symptoms effectively by helping them restructure their cognitive patterns. Via psychopharmacotherapy, they can improve their patients' depression-distorted negative perception of themselves, their environment, and the future.

Resilience as a Key Factor in Ageing Well

The psyche's elasticity is the secret to ageing well. Jeste et al. (2013) have shown that resilience (from the Latin resilire, to bounce back) versus depression plays a key role in the ageing process. Resilience is the gift to achieve a positive outcome despite being confronted with adversities. It keeps ready coping mechanisms in which genetic, molecular, neural and environmental factors are involved (Sampedro-Piquero et al. 2018; see also: Liu et al. 2018; Wu et al. 2013). The study findings were surprising in that the investigators found that growing older was rated increasingly more positively among people aged 50 to 99 years. Despite worsening physical and intellectual capacities, they reported increasing personal satisfaction among study participants (Jeste et al. 2013). Increased resiliency has been shown to slow down ageing and to improve overall health and quality of life (Faye et al. 2018). In fact, having a high degree of resilience enables individuals to perceive growing older more positively despite their declining physical condition. Having no depression or only a slight one also helps people report ageing in a positive light despite being in poor physical shape (Jeste et al. 2013). Reviewing various studies Estebsari et al. (2019) found the definition of successful ageing being linked to cognitive action, perception, control, life satisfaction, ethics, inner feelings of happiness and satisfaction with life for the present and the past. Sometimes successful ageing is also related to be survival with health (Estebsari et al. 2019). Involving the key factor of resilience the results of Jeste et al. (2013) seven years ago were slightly dissenting in that cognitive deficits are revealed as insignificant in multiple regression analyses. Mental health however plays a key role in assessing one's own ageing process positively. In this regard, it is strong resilience and only mild tendency for depression that are most effective. It is up to psychiatrists to help patient age better by focusing on positive psychiatry, analogous to positive psychology, concentrating on happiness, optimism, feeling safe, trust, solidarity and forgiveness. The study results emphasize the decisive role psychiatry plays in supporting ageing well among seniors with physical impairments. Resilience must be encouraged, depression treated and prevented (Braun and Kornhuber 2013; Jeste et al. 2013). Resilience addresses the ethical desideratum for a "connection between happiness and old age" (Rentsch and Vollmann 2012).

Ethical Considerations

The Connection Between Happiness and Old Age

The problem of dementia can appear as a cloud hanging over the "wisdom of old age" mantra, with its clinical and socioeconomic impacts. Yet the association between happiness and old age radiates undiminished through that cloud; "contentment is [...] not within the realm of poiesis. That applies to a happy life and a moment of intense happiness" (Meier 2010a). Old age is said to be of specific beauty enriched with the past having prepared it. Old age can be seen as God's grace given to man as the period when one enjoys the fruits of his labours (Nasilowska-Barud and Barud 2019). In 2019, Stončikaitė revisited happiness and wellbeing in later life from interdisciplinary age-studies perspectives and calls for a reconsideration of more global, integrated and holistic understandings of the process of growing old (see also: Ilyas et al. 2020; Ng et al. 2020). In Paolo Sorrentino's film Youth, the film director Mick characterises his own and the conductor Fred's youthful carefree way of life as a perversion, (https://www.hna.de/kultur/tv-kino/ ewige-jugend-tragikkomoedie-paolo-sorrentinoHOW CAN WE AGE BEST? 5

zr-5900873. Htm; Retrieved on 23 June 2016) a position that assumes a key function in the film. A carefree attitude *per se* is a characteristic young people are blessed with, and the Peggy March song Mit 17 hat man noch Träume from 1965 (http:// www.golyr.de/peggy-march/songtext-mit-17-hatman-noch-traeume-23440.html; Retrieved on 24 June 2016) (meaning: at age seventeen one still has dreams) communicates a retrospectivemelancholic hint of such a carefree attitude. When Mick considers with bitterness a carefree attitude as a perversion, it symbolises his imprisonment in perceiving old age as unhappy, and in order to escape from it, Mick commits suicide. Mick's "apathetic" friend Fred betrays himself and the love for his mute wife, who suffers from dementia, although once he had dedicated the "simple songs" to his wife and promised to only perform the songs accompanying his singing wife. Fred has broken his promise by conducting the "simple songs" for the queen while being conferred a knighthood. According to Hermann Hesse (1877-1962), "it is those people whom we find it most difficult to imagine as growing old who age best" (Hesse 1977). Regarding Sorrentino's interpretation of a carefree attitude to life, Hesse's aphorism could mean that a pronounced, youthful carefree attitude has a protective effect on coping with advancing age, provided that it lacks cynicism or sarcasm and includes a playful sense of humour. Knowledge has been collected from 100 researchers worldwide in the field of happiness for a book on that subject. Michael Eid, a professor of psychology at the Free University Berlin, was asked for a contribution reflecting the specific German situation (Bormans 2014; Eid 2014). He has been investigating the subjective perception of wellbeing for 20 years (Eid 2014; Eid and Larsen 2008). Eid considers pride and modesty as key qualities for a happy life. According to him, the concept of pride, although often having a negative connotation with arrogance, is rather an aspect of self-esteem (Eid 2014).

The dream of conquering old age can be traced back to the Greek and even Babylonian and Sumerian heroic epics. In considering the connection between old age and happiness, it would make sense to take a look at the German heroic saga known for "not having a happy end like the Greek ones" (Vischer 2015). In striving for eternal life, Johann Wolfgang von Goethe's (1749-1832) Faust states [w]erd' ich zum Augenblicke sagen:

Verweile doch! du [sic] bist so schön! Dann magst Du mich in Fesseln schlagen, dann will ich gern zugrunde gehen!, which means, do stay a moment, you are so beautiful, and if you put me in chains, I will be destroyed! Faust quests for a prolongation of life in order to experience a "Eureka", videlicet a moment of total happiness before his life ends (Goethe 1962). Heinrich Meier contrasts Faust's striving for happiness with Jean-Jacques Rousseau's (1712-1778) wisdom. For Rousseau, happy is an individual who can say Je voudrais que cet instant durât toujours, which means, I would like this moment to stay forever. Faust negates Rousseau's point of view emphatically and makes it the subject of his wager with Mephisto. At the end of Part One of Goethe's play, he ends up no less emphatically at the "anti-thesis" of the tragedy (Meier 2010b).

Old Age and Death

In *Youth*, a young Davos hotel guest (who became a star for having played a robot in a movie) quotes Novalis (1772-1801), Wo gehen wir denn hin? Immer nach Hause, immer nach Hause, which means "*Where are we heading? Home, always home*". Far distant from striving for infinity one's perspective now tends towards a final point.

According to the results of a lexical decision task to measure death-thought accessibility older people prime the lead to stronger facilitation of death-related compared, with negative words (Boudjemadi et al. 2020). Dying is a regulatory process of the organism, and all examples of apoptosis demonstrate that well-ordered living is only feasible through well-ordered dying (Krammer 2010).

Heinrich Meier offers an important philosophical perspective on the compatibility of happiness and death. He says, "This kind of life does not forget or suppress death. Rather, it incorporates it into the circle of its greatest activities and ultimately finds its supremê felicité (meaning: supreme felicity) through the contemplation of eternal flux and reflux" (Meier 2010b).

The fear of death cannot be argued away intellectually. Human beings are so grounded in the biological fundament that this fear cannot be eliminated by knowing that the finality itself need not frighten one. The overcoming of fear that results from self-relativisation is an entirely different matter. That is no longer an argument,

but rather a step forward, a turn around, and this turn-around does not appear to be possible until one first admits the fear of death and personally accept it as a biological basis (Tugendhat 2010). Ernst Tugendhat perceives self-relativism as a means of coping with the fear of death, a position that distances itself from the youth cult's antiageing tendencies. When one looks into the mirror and obsessively look for wrinkles, one is hindered from becoming less egocentric, as the prior condition for experiencing the happiness associated with gratitude and humour.

Appreciating the God-given purpose of life and death, although inevitable, need not be a time of despair, but a time of hope. For spiritual individuals, frailty not necessarily initiates an end but represents only part of a journey. An important aspect of the individual approach to death consists in understanding that there is a purpose in life. This purpose might be interpreted as related to God, to one's family, one's profession, or even one's avocation. It is shaped by one's given culture and one's spiritual heritage (Guinan 2016; see also Nasiłowska-Barud and Barud 2019).

CONCLUSION

To age well, one needs to enable and strengthen external factors in the lives that encourage happiness. One should internalise feelings of gratitude and positive self-esteem as preconditions for experiencing happiness.

Despite all the biogerontological promises to overcome age, it is important to confront early in life one's personal limitations and one's ultimate demise as a *conditio humana* (meaning: human condition). One needs studies to evaluate of how thanatological components are integrated in psychotherapy to improve a mentally sound ageing process.

RECOMMENDATIONS

Resilience must be encouraged, depression treated and prevented. A carefree attitude characterised by a lack of cynicism or sarcasm and a playful sense of humour should be enhanced. Botox therapies as a strategy to conserve eternal youth as well as to treat depression should only be carefully applied. Self-relativisation should be trained. It is important to create a foundation for purpose in life.

ACKNOWLEDGEMENTS

Thanks to Professor Dr. phil. fac. theol. Martina Schmidhuber and to Professor Dr. med. Andreas Frewer, M.A. for holding the seminar and correcting the seminar work. Parts of this article were presented in poster form at the World Congress of Psychiatry Meeting in Berlin, 2017. The researchers are grateful for the ensuing discussion.

REFERENCES

- Bergdolt K 2008. Der Traum von der Gesundheit. In: D Schäfer, A Frewer, E Schockenhoff et al. (Eds.): Gesundheitskonzepte im Wandel. Geschichte, Ethik und Gesellschaft. Stuttgart: Franz Steiner, pp. 17-28.
- Bormans L 2014. *The World Book of Happiness. Das Wissen* von 100 Glücksforschern aus aller Welt. 2nd Edition. Köln: DuMont Buchverlag.
- Boudjemadi V, Posner A, Bastart J 2020. Older people and death-thought accessibility: The association between death and older people in memory. *Death Stud.* doi:10.1 080/07481187.2020.1753852.
- Braun B. Wie kann das Altern bestmöglich gelingen? Ethische Reflexionen zur Rolle von psychischer Gesundheit im Spannungsfeld von "Glück" und "Tod". Professur für Ethik in der Medizin. Friedrich-Alexander-Universität Erlangen-Nürnberg, Hauptseminar SS 2016.
- Braun B, Kornhuber J 2013. Die elastische Rückstellkraft der Psyche als Erfolgsrezept für ein gelungenes Altern. Resilienz versus Depression. *INP*, 15: 11.
- Brecht B. 2007. *Die Gedichte*. Frankfurt am Main: Suhrkamp. Campisi J, Kapahi P, Lithgow GK et al. 2019. From discoveries in ageing research to therapeutics for healthy ageing. *Nature*, 571(7764): 183-192.
- Cosio T, Campione E 2019. A new hypothesis in botulin therapy for depression: Insula cortex modification. *Dermatol Ther*, 32(5): e13008. doi: 10.1111/dth.13008.
- Cranach M 2010. Ethics in psychiatry: The lessons we learn from Nazi psychiatry. *Eur Arch Psych Clin Neurosc*, 260: 152–156.
- Ehnie HJ, Marckmann G 2009 Die Verlängerung der Lebensspanne unter dem Gesichtspunkt distributiver Gerechtigkeit. In: S Knell, M Weber (Eds.): *Länger Leben? Philosophische Und Biowissenschaftliche Perspektiven.* Frankfurt a.M.: Suhrkamp, pp. 264–286.
- Eid M 2014. Stolz und Bescheidenheit. In: L Bormans (Ed.): *The World Book of Happiness.Das Wissen von 100 Glücksforschern aus aller Welt.* Köln: DuMont Buchverlag, P. 49.
- Eid M, Larsen RJ 2008. The Science of Subjective Well-being. London: Guildford Press.
- Ekman P, Levenson RW, Friesen WV 1983. Autonomic nervous system activity distinguishes among emotions. *Science*, 221(4616): 1208–1210.
- Estebsari F, Dastoorpoor M, Khalifehkandi ZR et al. 2019. The concept of successful aging: A review article. *Curr Aging Sci*, doi: 10.2174/1874609812666191023130117. [Epub ahead of print].

HOW CAN WE AGE BEST? 7

Faye C, Mcgowan JC, Denny CA et al. 2018. Neurobiological mechanisms of stress resilience and implications for the aged population. Curr Neuropharmacol, 16(3): 234-270.

- Gems D 2009. Eine Revolution des Alterns. Die neue Biogerontologie und ihre Implikationen. In: S Knell, M Weber (Eds.): Länger Leben? Philosophische und Biowissenschaftliche Perspektiven. Frankfurt am Main.: Suhrkamp, pp. 25-45.
- Goethe JW 1962. Faust. Erster und Zweiter Teil. München: Wilhelm Goldmann.
- Golowin S 1998. Um den Sinn der Welten. In: S Golowin (Ed.): Die groβen Mythen der Menschheit. Freiburg: Herder, pp. 238–261.
- Guinan P 2016. Frailty and oldage. *Linacre Q*, 83(2): 131-133.
- Hadley EC, Lakatta EG, Morrison-Bogorad M et al. 2005. The future of aging therapies. *Cell*, 120: 557–567.
- Hawlik AE, Freudenmann RW, Pinkhardt EH et al. 2014. Botulinumtoxin bei der Behandlung depressiver Störungen. FdNP, 82: 93–99.
- Hesse H 1977. Lektüre für Minuten. Gedanken aus seinen Büchern und Briefen. Excerpt from V Michels. Frankfurt am Main: Suhrkamp.
- Higgs P, Gilleard C 2017. Ageing, dementia and the social mind: Past, present and future perspectives. Sociol Health Illn, 39(2): 175-181.
- Holsboer F, Schöler H 2007. Therapiewege der Zukunft. In: P Gruss (Ed.): Die Zukunft des Alterns – Die Antwort der Wissenschaft. München: C.H. Beck, pp. 192-219.
- Home Page of Daidalosnet. From https://www.daidalosnet.de/SDV/navigation.nsf/(StartUI)? OpenAgent> (Retrieved on 23 June 2016).
- Home Page of University Hospital Würzburg. From http://www.neurologie.ukw.de/fuer-patienten/ambulante-sprechstunden/botulinumtoxin-therapie.html (Retrieved on 23 June 2016).
- Home Page of University Hospital Hannover. From https://www.mh-hannover.de/46.html?&tx ttnews%5Btt_news%5D=2356&cHash=d8e51f 5ade364336eecbe03179838699> (Retrieved on 23 June 2016).
- Home Page of the Magazine ZEIT. From http://www.zeit.de/zeit-wissen/2013/03/koerper-psyche-gefuehlegesundheit/seite-6 (Retrieved on 23 June 2016).
- Home Page of the Magazine. Hessische/Niedersächsische Allgemeine". From httml> (Retrieved on 23 June 2016).
- Home Page of GOLYRICS. From http://www.golyr.de/peggy-march/songtext-mit-17-hat-man-noch-traeume-23440.html (Retrieved on 24 June 2016).
- Ilyas Z, Shahed S, Hussain S 2020. An impact of perceived social support on old age well-being mediated by spirituality, self-esteem and ego integrity. *J Relig Health*. doi: 10.1007/s10943-019-00969-6. [Epub ahead of print].
- Jeste DV, Savla GN, Thompson WK et al. 2013. Association between older age and more successful aging: Critical role of resilience and depression. AJP, 170: 188–196.
- Knell S, Weber M 2009. Einleitung. In: S Knell, M Weber (Eds.): Länger Leben? Philosophische Und Biowissenschaftliche Perspektiven. Frankfurt am Main.: Suhrkamp, pp. 7–24.

Krammer PH 2010. Kein Leben ohne Tod. In: FW Graf, H Meier (Eds.): *Der Tod im Leben. Ein Symposium.* München: Piper, pp. 221–233.

- Kruger TH, Wollmer MA 2015. Depression--An emerging indication for botulinum toxin treatment. *Toxicon*, 107(Pt A): 154-157.
- Kruszynski A von 2016. Nur nicht hängen lassen! Anti-aging. *Madame*, 4(1): 88–92.
- Langer A 2015. Umstrittene Behandlung: Patientin Spritzt Botox Gegen Depressionen. From http://www.spiegel.de/gesundheit/psychologie/botox-gegen-depressionen-studien-zum-facial-feedback-a-1040298.html (Retrieved on 23 June 2016).
- Liu H, Zhang C, Ji Y et al. 2018. Biological and psychological perspectives of resilience: Is it possible to improve stress resistance? *Front Hum Neurosci*, 12: 326.
- Meier H 2010a. Epilog. Über Glück und Unglück. In: H Meier (Ed.): Über das Glück. Ein Symposium. München: Piper, pp. 273–285.
- Meier H 2010b. Über Leben und Tod. In: FW Graf, H Meier (Eds.): *Der Tod im Leben. Ein Symposium.* München: Piper, pp. 327–342.
- Nasiłowska-Barud A, Barud M 2019. Old age can be joyful too. *Wiad Lek*, 72: 1602-1606.
- Ng YT, Huo M, Gleason ME et al. 2020. Friendships in old age: Daily encounters and emotional well-being. *J Gerontol B Psychol Sci Soc Sci*, pii: gbaa007. doi: 10.1093/geronb/gbaa007. [Epub ahead of print].
- Novalis 2016. Heinrich von Ofterdingen. 1802 posthum von Friedrich Schlegel veröffentlicht. Stuttgart: Reclam.
- Parsaik AK, Mascarenhas SS, Hashmi Aqeel et al. 2016. Role of botulinum toxin in depression. *Jour Psych Pract*, 22(2): 99–110.
- Rentsch T, Vollmann M 2012. Der Sinn des Alterns zwischen Glück und Leiden. In: S Schicktanz, M Schweda (Eds.): Pro-Age Oder Anti-Aging? Altern im Fokus der Modernen Medizin. Frankfurt a. M: Campus, pp. 159-178.
- Rousseau J-J 1780-1789. Les Rêveries du promeneur solitaire. In: Collection complète des oeuvres, Genève, vol. 10, in-4°, édition en ligne www.rousseauonline.ch, version du 7 octobre 2012. From https://www.rousseauonline.ch/pdf/rousseauonline-0077.pdf (Retrieved on 20 April 2020).
- Sampedro-Piquero P, Alvarez-Suarez P, Begega A 2018. Coping with stress during aging: The importance of a resilient brain. *Curr Neuropharmacol*, 16(3): 284-296.
- Schwab G, Eigl K 1955. Die schönsten Sagen des klassischen Altertums. München: Südwest-verlag.
- Stearns TP, Shad MU, Guzman GC 2018. Glabellar botulinum toxin injections in major depressive disorder: A critical review. *Prim Care Companion CNS Disord*, 20(5): pii: 18r02298. doi: 10.4088/PCC.18r02298.
- Stončíkaitě I 2019. Revisiting happiness and well-being in later life from interdisciplinary age-studies perspectives. *Behav Sci*, 9(9): pii: E94. doi: 10.3390/bs9090094.
- Tötzel S, Hajak G 2015. Botulinumtoxin- ein Neuromodulator zur effektiven Therapie von Depressionen. *DNP*, 16(7/8): 24–32.
- Tugendhat E 2010. Unsere Angst vor dem Tod. In: FW Graf, H Meier (Eds.): Der Tod im Leben. Ein Symposium. München: Piper, pp. 47-62.
- Vischer FT 2015. Goethes Faust. Paderborn: Salzwasser Verlag. Reprint of the original from 1920.

Wareham CS 2018. What is the ethics of ageing? *J Med Ethics*, 44(2): 128-132.
Wollmer M A, Boer C, Kalak N et al. 2012. Facing depression with botulinum toxin: A randomized controlled trial. *Jour Psych Res*, 46: 574–581.

Wu G, Feder A, Cohen H et al. 2013. Understanding resilience. Front *Behav Neurosci*, 7: 10.

Paper received for publication in February, 2020 Paper accepted for publication in April, 2020