

Spring 2018, Issue 1



# CURIOSITY

**FEATURED**

## **TAKE ME TO THE MOON**

**Two space engineers,  
a common passion  
and a date with history**

## **THE MIND OF DR. SANDRA CHAN**

**A caring psychiatrist  
who lends herself to  
her students and patients**

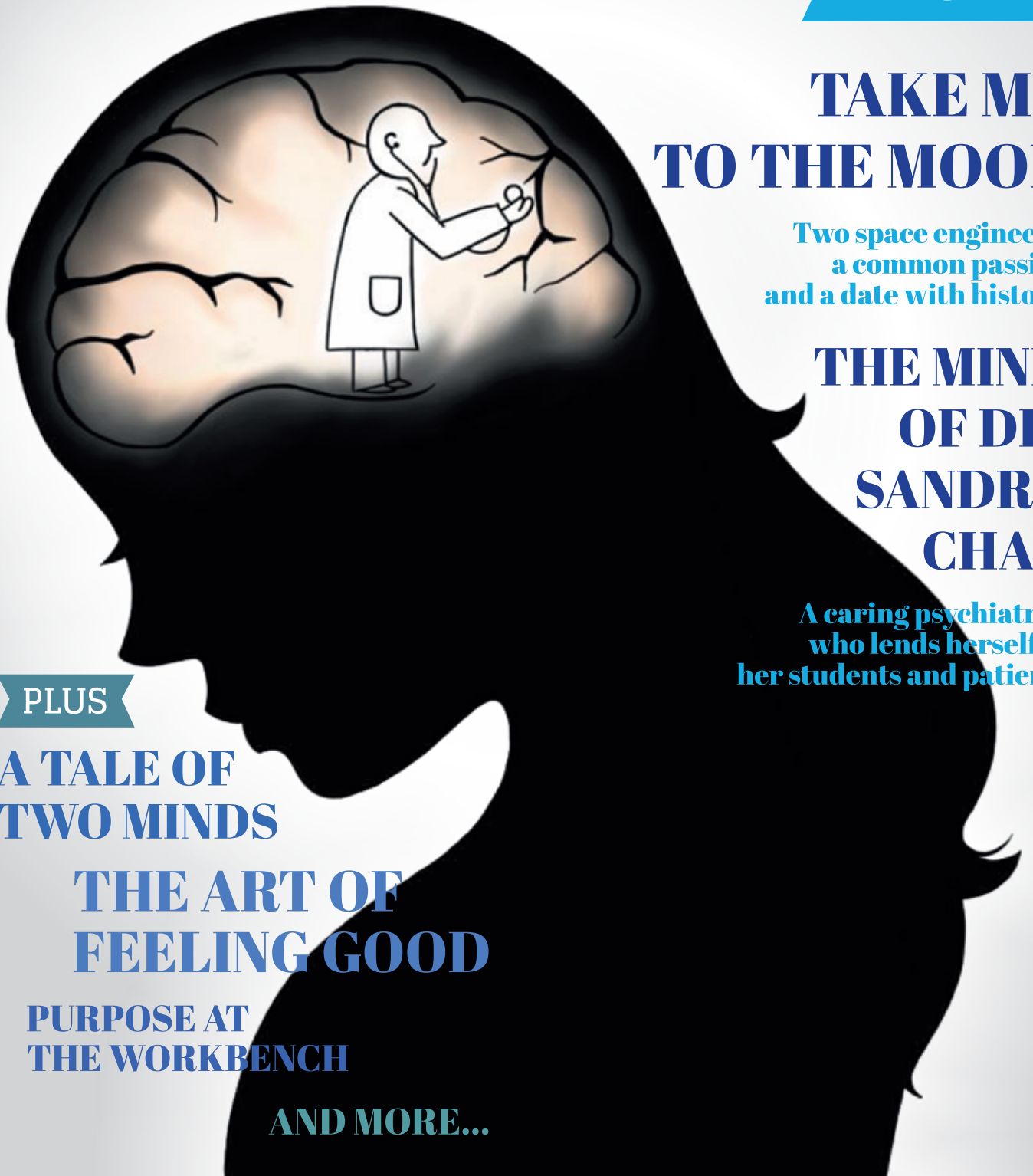
**PLUS**

## **A TALE OF TWO MINDS**

## **THE ART OF FEELING GOOD**

**PURPOSE AT  
THE WORKBENCH**

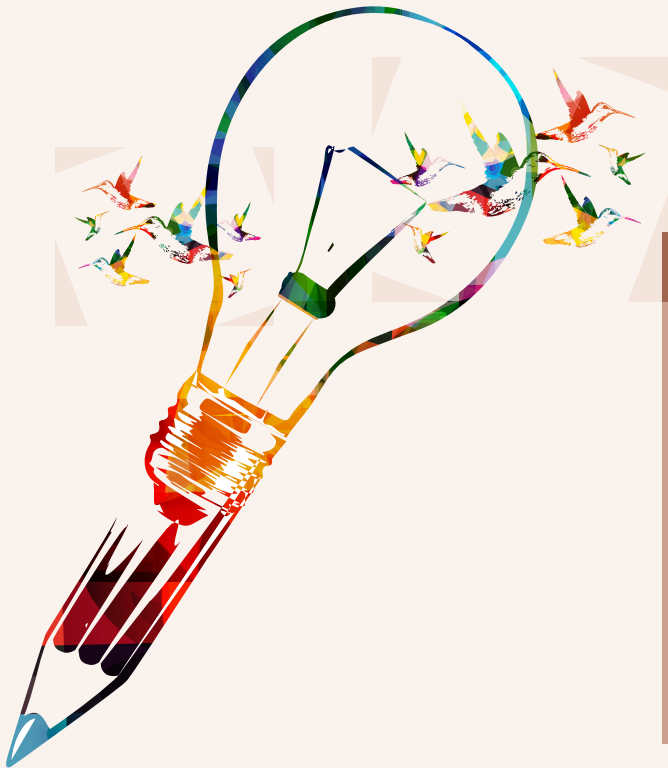
**AND MORE...**



If you are interested in being a guest writer for our next issue (to be released in Fall 2018), please answer the following prompt and send your piece (max 600 words) to: [curiositycuhk@gmail.com](mailto:curiositycuhk@gmail.com) titled "Guest writer submission" by 31 May, 2018.

We will contact selected candidates soon after!

"Tell us how *Curiosity* has shaped you to be who you are today"



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[www.curiositycuhk.com](http://www.curiositycuhk.com)

# Dear Readers,

Welcome to the pilot issue of CUriosity. You are holding in your hands what has been a ten month journey of what I'd like to think of as one of the most rewarding culminations of friendship, teamwork and passion. This is a group of CUHK students who relish university learning more than just in lecture halls, indulge in life more than just living it, and embrace writing for more than just its usual purpose as assignments. Writing is a form of expression to channel our thoughts to the world.

You will find four sections within this issue:

**THEME**, whereupon we address one topic (Mental Health) from different angles: the MIND article provokes thought, the HEART article arouses emotion, the NEWS article gives you a dose of relevant current affairs, and finally, the VOICE article features an interview with a CUHK professor, Dr. Sandra Chan.

**SPOTLIGHT**, contains articles that delve into various broader genres such as EARTH, ETHICS and ENVIRONMENT. Here, we hope to cater to a more diverse reader interest.

**FEATURED**, includes a single article by a guest writer. At this point, I want to extend a warm welcome to Mr. Philip Kitchens, a rocket engineer for NASA's Marshall Space Flight Centre, now retired, who has graciously composed a story of inspiration as he recounts his life and career. Phil is easily a role model for fellow students as ourselves, in his pursuit for and dedication to the science of spaceflight.

**LENS**, presents book reviews. I truly believe reading nurtures our souls, and I challenge you to defy the age of smartphones by taking out a book instead of swiping away at your screens the next time you are on the train.

We have made Mental Health our pilot theme. This is a topic that is over-talked about yet under-addressed in our time. The reason I say this is, despite evident efforts to raise awareness, I still witness incidences of stigmatization and discrimination against those who are perhaps a little eccentric, a little aloof, and a little melancholy. It is important to understand that those who endure mental health illnesses suffer an invisible pain. If you think seeing is believing, think again. I often think of the quote: "Be kind, for every person you meet is fighting a battle you know nothing about". Just as we are ignorant of their despair, we are also in no place to judge. Personally, it has been deeply humbling to see how the very writers of the team have taken their liberties in writing about this topic. Therefore, I hope you, our reader, come away having learned something, and having more perspective, insight, and empathy... as have I.

Sincerely,

*Serena*

*Editor in Chief*



# ACKNOWLEDGEMENTS

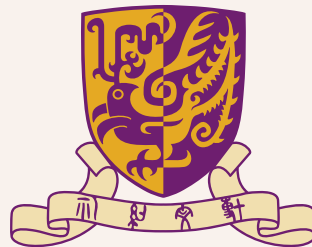
The members of the CUriosity team wish to express our gratitude to the General Education Foundation, for their full support and endorsement of our publication. In fact, one of the sources of inspiration for initiating this project stems from an enriching experience from the Dialogue with Humanity (UGFH) and Dialogue with Nature (UGFN) courses we all have taken in our foundation year. Reading classical texts have equipped us with an inquisitive mind, and we began to explore the realms of nature and humanity in new and expansive ways. In the journal, there are “UGFN, UGFH boxes” dispersed throughout, which derive some relation to their respective articles and aid student readers in making connections.

We also wish to thank the following contributors, who have each taken out time to read our drafts and gave the critical comments we very much needed as first time authors.

Dr. Lawrence Chiu (School of Life Sciences)  
Dr. Klaus Colanero (OGE - General Education Foundation)  
Dr. Wai Yin Ng (Centre for Learning Enhancement and Research)  
Dr. Jacky Ngo (School of Life Sciences)  
Dr. Maria Wai (Faculty of Medicine)  
Dr. Peggy Yip (School of Life Sciences)

Our sincere thanks also goes to Juliet Sun for illustrating our cover image and logo.

Finally, a very heartfelt thank you to Dr. Isabel Hwang (Faculty of Medicine), the supervisor to our project who has always given us valuable feedback at all the right times and pointed out our flaws in all the right places.



## *Why we joined this project, and what we hope to achieve*

Connect with readers with similar interest

To inspire others to ask big questions and find answers to them

Drag students away from their screens

To find a platform of an organized effort of expression

Writing is the most rigorous form of thinking and evaluating my ideas - I wanted to challenge myself

Encourage students to make time for curiosity

To empower people with higher social awareness and to make change

To encourage people to read about subjects beyond their field of speciality

Just because I am curious :)

Life is a kite and you need to run against the wind to gain a better view of the world around us

Polishing writing and communication skills

Learning to cooperate with others

Soothing my mind by expressing myself

Directing a film to capture the dynamic story of the world's dilemmas

# MEET THE TEAM



**Serena**  
*Editor in Chief*

Loves: Books, guinea pigs, knitting, piano, t-shirts with witty captions (currently wearing: "Talk nerdy to me"), dumplings, getting maths right.

Hates: Ignorance. Vanity. Spite. Idleness. Reckless indulgence.

Tolerates: People I love who have varying degrees of qualities above but have the potential to transition out of them.

Favourite quote: "...for anybody who's on the downside of advantage, and relying purely on courage...it's possible"  
-Russell Crowe's Oscar acceptance speech



**Lok Ping**  
*Writer*

Love reading biographies of great people who made personal compromises for the public good as a reminder that there is still good in the miserable world full of hypocrites who can't stand the temptations of fame and money.



**Emily**  
*Operations Officer*

An inquisitive mind undefined by rules, space, and form, constantly seeking to expand horizon. Also an avid learner of all things in this universe, aspiring to be a better art aficionado, enophile, researcher, and medical student. For now, it's all about living a life of adventure and delight.



**LKC**  
*Writer*



**Coco**  
*Illustrator*

A huge lover of animation and science alike. Trove of random trivia and facts. Really wants a pet. Reaching the first quarter of expected life and having already suffered multiple midlife crises. Many more are projected to occur in the near future. Also, a professional procrastinator of unprecedented renown.



**Bernard**  
*Writer, Website Designer*

Constantly exploring the world and a language enthusiast. Playing squash and the piano during my leisure time. Aspiring to becoming a more well-rounded computer scientist and putting what I have learnt into practice, making this world a better place. The sky's the limit.



**Tiffany**  
*Writer, Design Consultant*

An avid reader and keen learner. Insatiably curious. Passionate about all things science and art. Creative and artistic-ish. Sometimes jaded and sarcastic. Committed to close friends. A cat lover. A discophile wanna-be. A clinophile with no shame :)



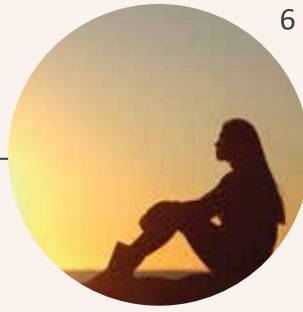
**Felix**  
*Writer*

Hoping to paint a perspective that is different to what is commonly seen in newspapers or documentaries. As a writer, I believe effort and consistency are the most important principles.

Likes working towards a goal and wishes to join the rowing team.

One sentence that sums up my motivation is Zuckerberg's Harvard graduation speech: "Ideas don't come out fully formed. They only become clear as you work on them. You just have to get started."

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THE  
*Art*  
OF  
FEELING  
GOOD

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A Do it Yourself  
Guide to  
Cognitive Behavioral Therapy  
by Tiffany



'I failed this major course, I'm going to graduate with 3rd honour...' 'He/She friendzoned me, I'm gonna AO grad... I'm gonna be forever alone...' 'I'm eating alone in the canteen and people are looking at me weird, they must think I'm a loser...'

Have you ever had these thoughts cross your mind? Do you find yourself dwelling on the negative especially during difficult times? Do people's criticisms or insults get stuck in your head sometimes for hours or even weeks? Worse yet, do you ever find yourself being so negative for long periods of time?

This is in fact due to our brain's "negative bias". Our capacity to put emphasis on the negative rather than the positive has probably been an evolutionary phenomenon. From the earliest of times, actively anticipating potential dangers and avoiding them have been critical skills for survival. But these types of survival instincts are no longer suitable for the kind of living and society we are in today. Instead, because of such instincts, we get episodes of depression, anxiety, low self-esteem and insufficient self-love.

Depression has been viewed as an emotional disease throughout the development of psychiatry itself. It is so widespread that it is named 'the cold' within the psychiatry ward. It is also estimated that by 2020, depression will be the most important health condition after heart disease in the world.

However, 'depression is not an emotional disease.' said Dr. David Burns, an adjunct clinical professor of psychiatry and behavioral sciences at Stanford University. His bestselling

book, *Feeling Good: The New Mood Therapy*, is most often recommended by mental health professionals to patients suffering from anxiety and depression. Dr. Burns touched upon a profound idea in depression, which is that the feeling of worthlessness, hopelessness and helplessness stems from our inner voice which influences our emotions and perception of our surroundings. This concept is aptly worded by Cobb from the movie 'Inception' when he says 'An idea is like a virus. Resilient. Highly contagious. And even the smallest seed of an idea can grow. It can grow to define or destroy you.'

**Therefore, I have come to agree that it is our illogical pessimistic thoughts that play an important role in the constant arousal of depressed moods. Now you may be thinking: "how does knowing that help me?"**

***It changes everything.***

Cognitive-behavioral therapy (CBT) is a therapy that is often used to help

people think in a healthy way. CBT, founded by Dr. Aaron Beck in 1970, is based on the principles of learning theory, and is a form of consequence appraisal therapy where one takes an active awareness of the consequence of one's behavior and try to change them gradually. Many people work with a therapist to learn CBT in the form of a dialogue but you can also practice healthy thinking on your own.

The first step to pulling yourself out of the spiral of negativity or rewiring it to think in a more positive way is to identify your negative thoughts; the different filters your brain puts on whenever you encounter something bad. Now, no one's telling you to identify your negative emotions because the emotions you feel are indeed very real to you but your thoughts, which created the emotions in the first place, may in fact be distorted. So, every time you get the feeling of depression due to something or even someone, try to identify the corresponding negative thoughts you have. Then, classify the different mental filters you give yourself. Read the table a few times, so that you can eventually identify which type of cognitive distortion you get every time a negative thought pops up.



A more concrete way of doing this would be to make a table out of it. Divide a table into three columns.

When you encounter something negative, write down that negative thought in the first column. Then, identify the cognitive distortion in the middle column. Lastly, rebut your thoughts with a logical one.

For instance, you worked really hard on an assignment but you did not score the highest mark. You feel extremely frustrated (negative emotion). You probably think ‘this is stupid, I’ll never get it right!!!!’ (negative thought). Write this down in column 1. Now, look at the table, you’ll find that your mind has put up a few mental filters: All-or-nothing thinking and Overgeneralization. In that moment, you think that because of this mishap, you will never be able to perform well (Overgeneralization), and you’ve deemed yourself a failure (All-or-nothing thinking). Write this down in column 2. Finally, rebut with logic. It is preposterous to think that you’ll never get it right, which is an exaggeration, because there are some other things you have done right. So why punish yourself for this little mistake you made? Instead of deeming yourself a failure and that you will never succeed, you should instead look for ways of improvement like asking the professor for comments and advice on how to do better. Now, write this down in column 3. These might sound futile to you but remember your brain actually believed it in the first place, that because of one assignment, you really are stupid.

As Dr. Burns suggested, do not just do this in your head. You would just end up losing the argument with yourself and get even more depressed. Writing your thoughts down makes it easier for you to see what is wrong with your thoughts in the first place. I tried this for two weeks and though I was

skeptical at first, I could not believe how distorted my thoughts were and just how much my mind believed those thoughts. Now I understand why people say that your inner voice is a double-edged sword, it could really make you or break you. *So wield it for, and not against yourself.*

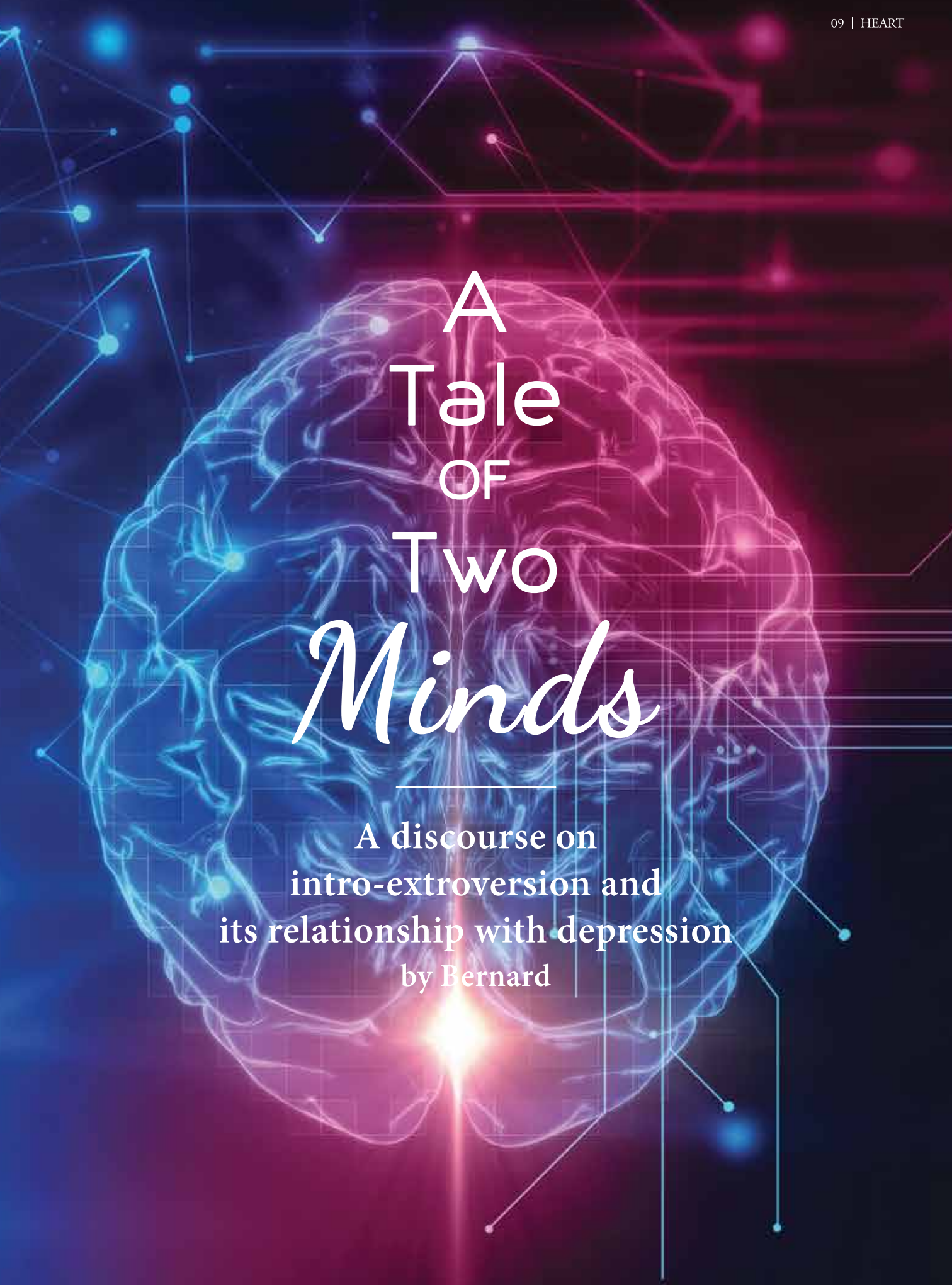
### Definitions of Cognitive Distortions:

1. **All-or-nothing thinking:** you only see things in black-and-white categories. If your performance falls short of perfect, you see yourself as a total failure.
2. **Overgeneralization:** you see a single negative event as a never-ending pattern of defeat.
3. **Mental filter:** You pick out a single negative detail and dwell on it exclusively so that your vision of all reality becomes darkened, like the drop of ink that colors the entire beak of water.
4. **Disqualifying the positive:** You reject positive experiences by insisting they “don’t count” for some reason or other. In this way you can maintain a negative belief that is contradicted by your everyday experience.
5. **Jumping to Conclusion:** You make a negative interpretation even though there are no definite facts that convincingly support your conclusion.
  - a. Mind reading. You arbitrarily conclude that someone is reacting negatively to you, and you don’t bother to check this out.
  - b. The Fortune Teller Error. You anticipate that things will turn out badly, and you feel convinced that your prediction is an already-established fact.
6. **Magnification (Catastrophizing) or Minimization:** You exaggerate the importance of things (such as your goof-up or someone else’s achievement), or you inappropriately shrink things until they appear tiny (your own desirable qualities or the other fellow’s imperfections). This is also called “binocular trick”.
7. **Emotional Reasoning:** You assume that your negative emotions necessarily reflect the way things really are: “I feel it, therefore it must be true.”
8. **Should Statements:** You try to motivate yourself with shoulds and shouldn’ts, as if you had to be whipped and punished before you could be expected to do anything. “Musts” and “oughts” are also offenders. The emotional consequence is guilty. When you direct should statements toward others, you feel anger, frustration, and resentment.
9. **Labelling and Mislabelling:** This is an extreme form of overgeneralization. Instead of describing your error, you attach a negative label to yourself: “I’m a loser.” When someone else’s behaviour rubs you the wrong way, you attach a negative label to him: “He’s a goddamn louse.” Mislabelling involves describing an event with language that is highly coloured and emotionally loaded.
10. **Personalization:** You see yourself as the cause of some negative external event which in fact you were not primarily responsible for.



*Definitions of Cognitive Distortions*

Source: ‘Feeling Good: the New Mood Therapy’ by Dr. David D. Burns, M.D.



A  
Tale  
OF  
Two  
*Minds*

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A discourse on  
intro-extroversion and  
its relationship with depression  
by Bernard

"Why are you always alone by yourself? Don't you want to come to the party and get socialised with other people? There are so many people that we have not met before!"

Whenever my friend A invited me to a place that is crowded with other people, I would decide to tag along even if it is against my own will. The truth is, I knew that deep in my heart I would be better off being in solitude meditating or with only a few of my best friends, sharing some ideas and reflecting upon ourselves.

I did not follow my own heart.

Even though I would not call it a mental breakdown and I really much appreciated A's generosity towards me, I felt that the very prospect of socialising with others at an extremely noisy place has become an overwhelming burden and always depressed me quite a bit. Seeing other people in the party having so much fun, I began to antagonise myself as being 'antisocial', believing that there was fundamentally something wrong with me that I needed to get rid of<sup>[1]</sup>. I thought it would be ideally better for me if I could polish my social skills by going to these social gatherings as frequently as possible so that I would one day become a 'social butterfly', just like A is. By all means were my social skills getting better and better with the repercussions that struck me hard when I started to realise that I was not happy within and content with myself at all.



**I can still remember the times that I succumbed to depression and wept all over my bed when sleeping. The sorrow and loneliness deep inside me was inexplicable.**

It was not until when I saw the inspiring TED talk by Susan Cain, a former attorney and a self-proclaimed introvert, that I got a totally new perspective on the topic of introversion<sup>[2]</sup>. Through this TED talk, introversion manifests itself as a strength instead of weakness. This is something I started to learn to appreciate and embrace. This quietness-seeking part of myself has become empowering as ever and now I would go out socializing only when I want to. Every week, I would assign myself some downtime to get recharged to make up for the time I spent socializing with others. I have discovered a treasure trove that I have long forgotten deep in mind and I no longer feel that

depressed. I loved her speech so much that I also bought her New York Times bestseller, <Quiet: The power of introverts in a world that cannot stop talking> that embarks on the discourse of finding a serene self without worrying too much about how others judge you. The book has given me a revelatory insight into the world of introversion itself to my heart's content and angles into some psychological cases.

**The meaning of extroversion or introversion :**

Extroverted people see the happiest time when interacting with others, while introverted people tend to spend their most cherished time alone.

**Do you have to be extroverted to be creative and influential?**

"If you are an extrovert, you are more likely to express your idea to the point and come up with creative ideas, and as a result, more likely to influence others", this is a common value that a lot of people nowadays still uphold.

But what I am going to tell you might shock you. Contrary to popular belief, what researchers have found out is that there is a zero correlation between how well one is able to deliver a public speech and how introverted he or she is. With practice and enthusiasm, introvert Susan Cain was able to deliver one of the most popular TED talks ever (in fact, introverts are oftentimes more insightful in terms of explaining things).

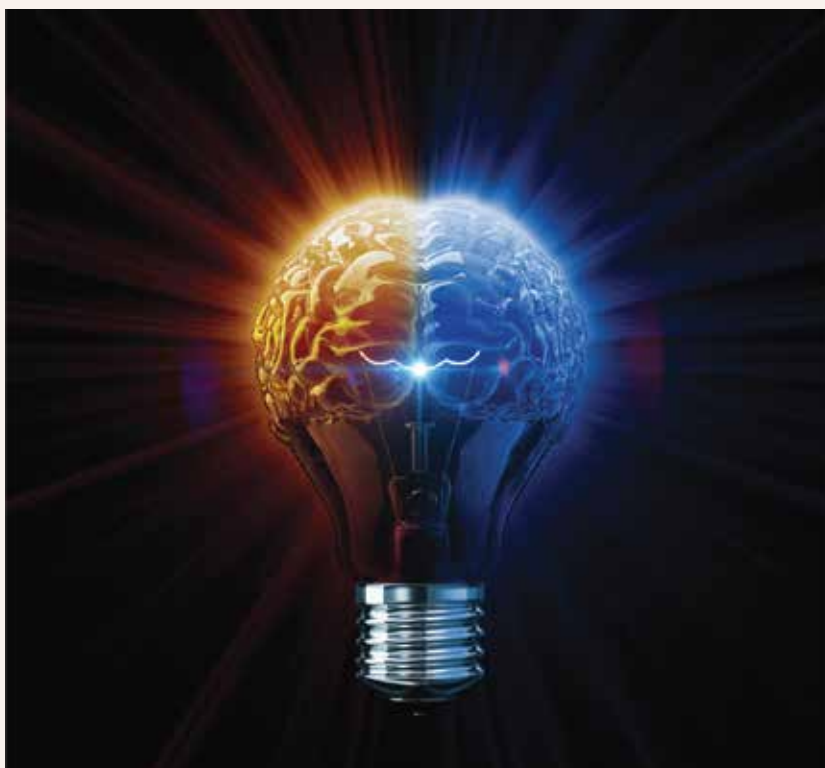
Among other original thinkers are Rosa Parks, Steve Wozniak, Mahatma Gandhi, who at their best moments like to be in a quiet place without any interruption while being extremely creative at the same time.

Mahatma Gandhi, the Indian national hero who led the independence movement against the British rule, was perhaps surprisingly, an introvert in his

nature. In his autobiography, he mentioned that in his childhood he had always been the first student to rush out of the classroom, fearing for any contact with other people. For Gandhi, talking to other people was one of the hardest things to do; his teeth would even chatter upon seeing them. But with his intense shyness also came his strength. Instead of trying to conquer his intrinsic tendency to be reserved, his cautious selection of words and contemplative nature won him the respect of others and led to the success of his non-violent campaign<sup>[3]</sup>.

Rosa Parks, a well-known civil rights activist in the 1950s and the 60s, was considered to be very soft-spoken and

reserved. Small in stature and composed as she may have been, her very act of refusing to give up her own seat in the so-called Montgomery bus boycott exerted a momentous impact on the progress of equality in the United States. Had it not been for her silent act of defiance against the racial segregation system in the United States, the world we now know today would be drastically different<sup>[4]</sup>.



Steve Wozniak was one of the pioneers in the field of personal computer who co-founded Apple along with Steve Jobs in the late 1970s. When he worked on Apple I (one of the first personal computers), he would lock himself up in the cubicle for almost an entire day (except when it is time for dinner), displaying his introversion through his complete dedication to his work. He did not like to socialise with others too much and he always preferred to work alone. He would relish in the very thought of working by his own, enjoying

the quiet nights and watching the sun rise all by himself.

These three people are all extremely creative and influential in their own respective right. Yet, they all have a serious streak of introversion that flows through their veins.

### Free trait theory

Now you may start to wonder, what prompts the introverts to speak or act so effectively when they are given the chance to do so? The answer to this question lies in the so-called Free Trait Theory put forward by Brian Little, a self-proclaimed introvert and a psychology professor at Harvard. According to him, there are two kinds of traits in all of us. On one hand, there are the fixed ones known as “fixed traits”, which are endowed upon us the very moment that

we are born and dictate, for example, whether you are an introvert or not (i.e. whether you will feel most at ease during your downtime). On the other hand, there is also another kind which are the “free traits”, that are created in the need for an emergency, a “personal project” that one considers crucial to



his or her core value. For instance, for Professor Little, his moment of relish comes right after his lecture is over. He would bolt to the bathroom within a matter of ten seconds and lock himself there, avoiding speaking to anyone and be away from the “personal project” (lecture in this case) to get fully recharged. As Professor Little puts it in one of his TED talks, “to talk to an introvert on the job is the best way to make him or her constipate”<sup>[5]</sup>.

To sum up, introverts are able to act the same as extroverts for the goals that they deem very important if the tasks that they do are not excessive and the reverse also holds true. That is why Abraham Lincoln, the former U.S. president who was also an introvert himself, was able to deliver The Gettysburg Address, one of the most extraordinary speeches ever, while an extroverted scientist might spend hours at the laboratory doing a project without any pause, demonstrating his or her ability to focus on something he or she regards as important attentively without being distracted at all. They all unleash some part of themselves and, provided with enough downtime (or uptime for extroverts) outside their time for their goals, they will also exude confidence and be in the optimal state of mind. Depression, in fact, may partly be due to the imbalance between a goal time and a recharging time, and it is crucially important to understand this.

The balance struck between introversion and extroversion is so delicate yet so wonderful.

### **Wired differently**

Did you know that extroverts and introverts have different brain structures? According to research by Dr. Katherine Benziger, we have a structure in our brainstem called the ascending reticular activating system (ARAS) which regulates the adequate

level of stimuli in order to keep us in the optimal state<sup>[6]</sup>. The fundamental differences between an introvert and an extrovert lie in the fact that extroverts crave for more stimuli by interacting with other people to reach the same level while the introverts need some downtime to alleviate the level they experience in ARAS<sup>[7]</sup>.

Also, a parenting book called <Quiet Kids, Help your introverted child succeed in an extroverted world> by Christine Fonseca highlights some of the mechanisms with which extroverts and introverts operate differently. For extroverts, their brain area responsible for producing dopamine, a neurotransmitter that induces the feeling of



pleasure, will become much more active compared to that of introverts, while introvert's brain is much more active in terms of producing acetylcholine, a substance that can tranquilise the mind and help them reach a state of peace in mind<sup>[8]</sup>. Science really makes a difference.

### **A time for change**

Ever since the last century, the world has become one of commerce, and communication skills have become crucially important. As a result, many

people start to mistakenly contribute effective communication to extroversion. While I am not being critical of the extrovert, introversion has ever since carried a negative connotation. Even though I am not an expert in this field, I hope that whenever you see this article, it will serve as a reminder and encouragement when you face similar struggles in life. Depression resulted from others' misconception about introversion and extroversion is simply not worth it. I believe that in this society, there are many people like my friend A, who is firmly convinced that one has to be an extrovert to be successful and urges others to do the same. Little do they know it is also vitally important to assign yourself an

appropriate amount of uptime and downtime to make sure that you will not be overburnt<sup>[9]</sup>.

Living in the 21<sup>st</sup> century where people are more closely connected, I am firmly convinced that we no longer need to create barriers among ourselves and attach any stigma to either introverts or extroverts.



## The creation for a society where everybody is independent while being closely connected lies in the respect for personal freedom and space.

While some might prefer to speak vociferously when they feel under the weather, others will feel liberated when they cozily have a sip of hot tea and exercise their imagination through writing or reading in their leisure time. This is the worst of times, but this is also the best of times, where every one of us can cooperate together on making this world a better place<sup>[10]</sup>. It is high time that we stop victimizing others in our own light due to misconceptions and embrace each other's differences.

### Explanatory notes and further readings:

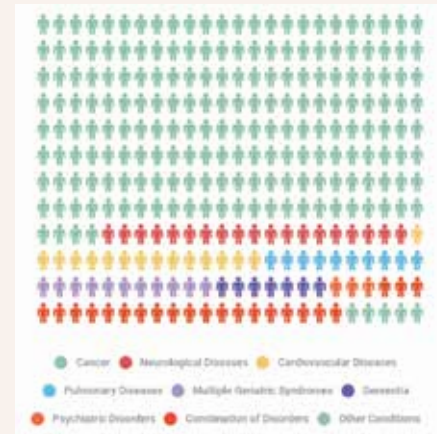
- [1] People usually misuse the word antisocial and use it to refer to those who prefer less interaction. Asocial would be a more precise term for that. Anti-social behaviors would be those that show general hatred of human nature.
- [2] <https://www.youtube.com/watch?v=c0KYU2j0TM4&t=42s>  
“The Power of Introverts” TED Talk by Susan Cain
- [3] <https://www.quietrev.com/gandhi-on-the-value-of-introversion>  
How introversion helped liberate a country
- [4] <https://www.truity.com/blog/5-super-successful-introverts-and-what-they-did-right>  
Five super successful introverts, and what they did right
- [5] [https://www.ted.com/talks/brian\\_little\\_who\\_are\\_you\\_really\\_the\\_puzzle\\_of\\_personality?language=en#t-470441](https://www.ted.com/talks/brian_little_who_are_you_really_the_puzzle_of_personality?language=en#t-470441)  
Who are you, really? The puzzle of personality
- [6] <http://www.benziger.org/articlesIng/?p=30>  
The physiology of type: introversion and extroversion
- [7] <https://www.youtube.com/watch?v=LxZ1fPr9FJg>  
Introverts and Extroverts have different brain structures
- [8] <https://www.quietrev.com/why-introverts-and-extroverts-are-different-the-science>  
Why introverts and extroverts are different
- [9] <https://introvertspring.com/are-introverts-more-likely-to-be-depressed>  
Are introverts more depressed?
- [10] This sentence is reminiscent of the first sentence in *The Tale of Two Cities* by Charles Dickens. Even though we have long been in the grip of misconceptions about the relationship between introversion and extroversion, it is also one of the best times where we can improve upon our society by dispelling them.

# LOSING YOUR MIND : DO YOU LOSE YOUR 'RIGHT TO DIE' TOO?

Is euthanasia an option for mentally ill patients?

by LCK

*Since the age of 5, she has been sexually abused. She was rescued ten years later, but the events scarred her with Post-Traumatic Stress Disorder (PTSD). Psychiatrists were unable to relieve her suffering despite various treatment modalities have been attempted. Ten years have passed, yet she incessantly conveyed the will to die. According to the Independent, her wish of euthanasia was granted in 2015.*



## Rising numbers

This was one of the many psychiatric cases that met criterias for euthanasia in the Netherlands. The Netherlands is the first country to legalise both euthanasia and assisted suicide (EAS), and its practice is regulated under the “Termination of Life on Request and Assisted Suicide Act”. Since its legalisation in 2002, the number of deaths by Euthanasia or Assisted Suicide (EAS) tripled to 6,091 in 2016, with about 70% of them due to incurable cancer. It is reasonable to expect a rising trend for euthanasia, since its provision is a relatively new end-of-life service. As with other new services, we can speculate it to trend with an initial rise followed by a plateau.

Generally speaking, the prerequisites permitting euthanasia among legislated countries include:

- The patient is chronically ill with unbearable suffering

- No improvement of health can be foreseen
- The patient is capable of making the decision
- The request is made repeatedly and voluntarily

The law did not specify the nature of “unbearable suffering”, hence it is legal to provide EAS as long as the patient met the aforementioned criteria. The first two conditions implied that it is acceptable to give up the fight once you know for sure nothing else can be done. In most circumstances, these are people whose lives are going to end soon anyway. The next condition highlights another assumption: that if you have lost decision-making capacity, you will lose the right to decide what is the best for you. It is these values, upon which

## Nature of Conditions for cases that complied with EAS criteria in 2016

*Data from Regional Euthanasia Review Committees, Annual Report 2016, the Netherlands*

the prerequisite conditions are based on, that raise concerns on permitting patients with mental health disorders for euthanasia.

According to the Dutch Regional Euthanasia Review Committee’s annual report, the number of deaths by euthanasia due to mental health disorders has climbed from 2 in 2010 to 60 in 2016 in the Netherlands. Among those applicants, 55% of them were suffering from depressive disorders- an alarming call for some. Perhaps the thirty-fold rise of EAS over only the course of six years is not solely due to the increasing use of a ‘new service’. Rather, it can signify the increasing recognition of psychiatric patients’ requests as being no different from that of other health conditions. Although this can be true, it is actually



much trickier and requires delicate considerations by the physicians.

### The issues with providing EAS for psychiatric patients

Concerns arose since individuals with mental health disorders have higher tendencies of committing suicide, some fear that euthanasia will be exploited as a means of ending one's life for the wrong reasons. Studies found that 90% of people who committed suicide was diagnosed with a psychiatric disorder before death. Oxford Psychiatrists calculated the risk of committing suicide is tenfold for individuals suffering from a mental health disorder, most notably affective disorders (including depression and bipolar), schizophrenia, personality disorders and anorexia nervosa. The strong association between suicides and mental health disorders supports the worry that psychiatric patients request for EAS with suicidal intentions.

Nonetheless, this does not mean such requests should be rejected light-heartedly. Udo Schüklenk, Professor of Bioethics from Queen's University, Canada, warns of the slippery slope - that mental health disorder implies incompetence, which would stigmatise against such patients from receiving euthanasia.

To do these patients justice, physicians would therefore measure the patient's mental capacity<sup>[1]</sup>. This is particularly important for patients suffering from neuropsychiatric diseases, such as dementia and mental health disorders. Cognitive functions can be severely impaired for patients suffering from these conditions. A study published in the British Medical Journal estimated that 60% of psychiatric in-patients lack the capacity in making decisions on their treatment.

They perform poorly in assessments of four abilities: understanding,

appreciation, reasoning and expressing a choice. The assumption follows that if patients are requesting for EAS in a diseased mental state, the request could not have been well-considered. In light of this, society has the duty to protect its people, even if it is to protect them from themselves.

Physicians therefore face a difficult task of differentiating patients who request for euthanasia with a mind clouded by the disease, from those who request for euthanasia with a sound and 'competent' mind. Crucially, this separates the two populations - those who wish for life, but sees death as the only way to end the suffering; from patients who wish for death, contented with life and is ready to forgo the rest of the time in anticipation of poor quality of life.

And this final judgement lies in the hands of the physicians.



Facing this difficult task, psychiatrists reached a consensus that the patient must be interviewed by multiple independent physicians to ascertain the compatibility.

“Granting EAS requests involve considerable physician judgment, usually involving multiple physicians who do not always agree... but the

euthanasia review committees generally defer the judgment to the physicians performing the EAS”, says a review of EAS for psychiatric patients in the Netherlands.

One answer to the problem may be time. Rehabilitation psychiatrist Dr. Yadav shared that “clinical experience suggests that capacity assessment, done over a period of time, is possibly more reliable... than if done once”. This echoes with the “most ideal psychiatrist” being “reachable and takes his time”, as rated by psychiatric in-patients, according to a German study. Reviewing patients' history in the long run will therefore help determine whether the decision for EAS is well-considered.

Another challenge that hinders physicians from coming into agreement is the difficulty in predicting the course of disease for psychiatric disorders. For instance, in order to prove medical futility for treatment-resistant depression, complex factors such as treatment non-compliance and the patient's social support network have to be taken into account. The lack of understanding on the long-term development of psychiatric diseases only compound on the difficulty, as a study by Vegunst, Fekadu and Wooderson et. al. revealed. If the course of disease cannot be determined, then the second prerequisite of EAS - that no improvement in health can be foreseen, will no longer apply to the patient.

### The implications

One cannot avoid the elephant in the room - is euthanasia an alternative resolution to incurable, treatment-resistant mental health disorders? It is particularly susceptible in certain psychiatric patients, e.g., depression, obsessive-compulsive disorder, schizophrenia, etc, when they ruminate on the subject of death and relief. It may even be the least agonising way to go.

This viciously reinforces the loss of hope for treatment, and an inability of ever getting well. Limitations in science nowadays means more effective treatments may be developed in the future, and it would be tragic if lives are lost due to discouragement to survive. Some therefore believe the emphasis of discussion should be placed on how to promote advancement in research and healthcare instead.

This is one of the reasons why euthanasia is not made legal in Hong Kong. In a legislative council meeting held late in 2016, Dr Ko Wing-man, previous Secretary for Food and Health, stated that: “The Government has no plans to carry out any study or consultation



on the issue of legalising euthanasia for the time being”.

Dr. Ko explained that: “There may be occasional cases of terminally ill patients requesting euthanasia when their physical and mental pain goes unmanaged. However, most of these patients will change their mind and give up their requests when their pain is under control after receiving suitable palliative care<sup>[2]</sup> treatment. We should therefore look for ways to improve our palliative care services for terminally ill patients who are in both physical and mental pain, so that more of them can receive suitable treatment, instead of considering how to implement the so-called euthanasia”.

One thing we can all agree on, is that knowledge is the only way to bring this discussion onto the next step. Research into better understanding the pathophysiology behind mental health disorders is important, in order to take care of the patients in the best way possible. Research into how current EAS approvals are carried out for psychiatric patients is equally

crucial, to develop guidelines for physicians.

### Respecting decisions

As a medical student, I believe it would be dangerously easy to discriminate against psychiatric patients, due to our lack of understanding of the disease itself and lack of perspective from not having personally experienced the disease.

The fundamental duty of a physician is to *do no harm*, a professional legacy of the Hippocratic Oath since the times of ancient Greek.

Who has the right to decide which does more harm: administering the patient life-ending medication, or letting the patient suffer for the rest of his/her lifetime?

Afterall, the goal of euthanasia is to provide an option to terminate one's life in a peaceful way. To the family and partners, it is also an opportunity for “healing”, and a time for well-prepared farewell, which often is what hurts most from sudden deaths—words left unsaid, relationships unfixed, and regrets.

### Explanatory notes:

- [1] In medicine, ‘capacity’ is “the ability to use and understand information to make a decision, and communicate any decision made”, as defined by the National Health Service, UK. This corresponds to the legal terminology, ‘competence’, which refers to “the mental ability and cognitive capabilities required to execute a legally recognized act rationally”, according to the American College of Legal Medicine.
- [2] Palliative care is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness. It involves treatment of pain and other distressing symptoms, and intends neither to hasten or postpone death. Definition retrieved from World Health Organisation.

### Author's note:

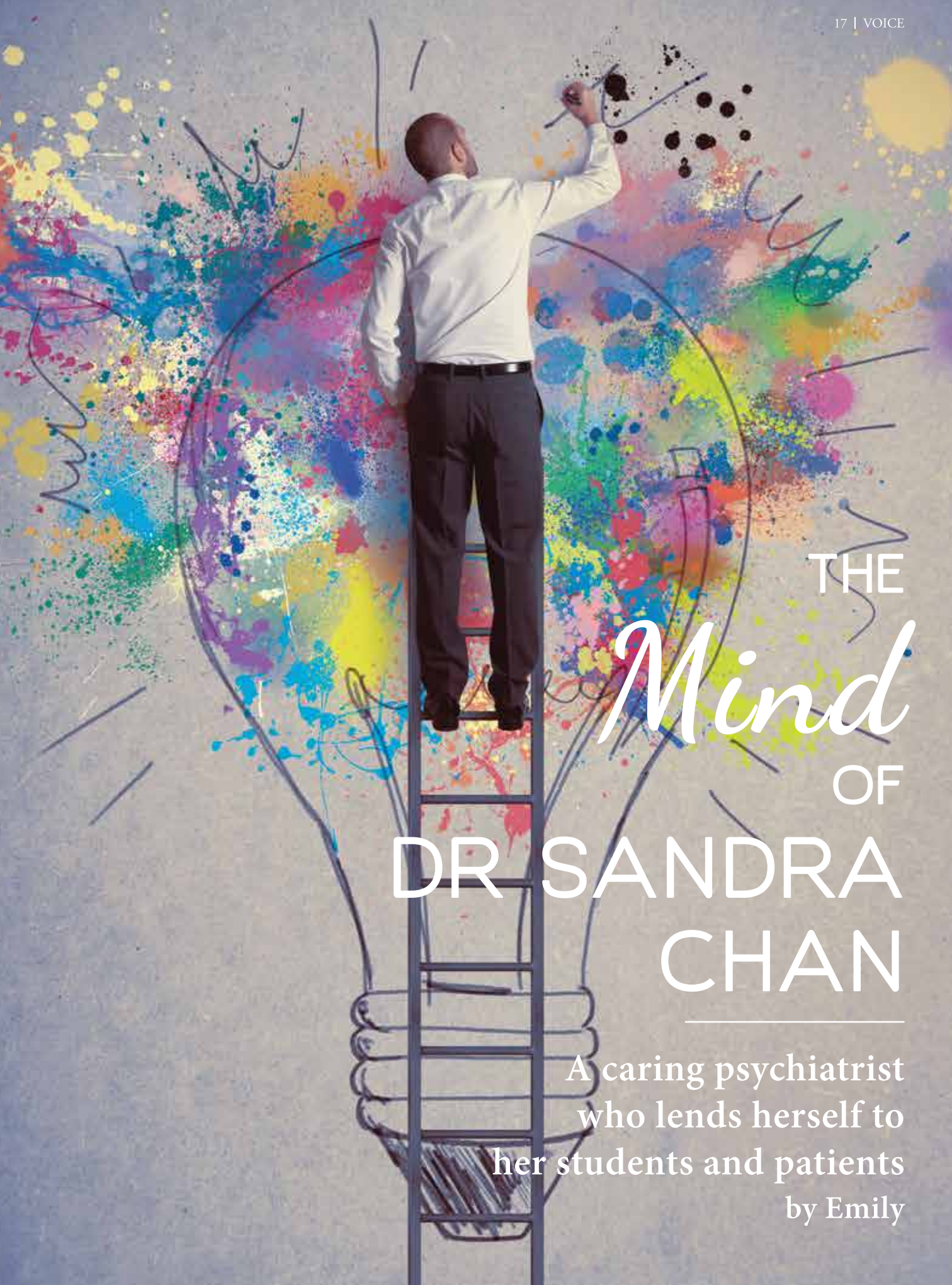
For discussion sake, all mental health disorders discussed are referring to treatment-resistant states only, given the current limitations on medical sciences as inadequate in providing effective treatment. The overwhelming majority of patients improve with medication, psychotherapy and/or social therapy.

Medical professionals do not see death as a solution to problems; even in treatment-refractory cases, death is not an alternative to living.

### UGFH Box: Jean-Jacques Rousseau's The Theory of Social Contract

The general will of the people, rather than the individual's interests, rules the people in society. We sacrifice our freedom in exchange for the ‘civil liberty’ society grants us, including submitting to the laws that authorities enforce on us. In Hong Kong, one of such laws is that euthanasia is illegal. However, to what extent does this ‘law’ reflect the ‘general will’? When it comes to matters of an individual's life and death, is the ‘general will’ still more important than an individual's right and freedom? Countries such as the Netherlands, Belgium and Columbia believe that it is the ‘general will’ to respect an individual's right. To those who advocate for legalising EAS, how can they argue to make EAS contribute to the ‘general will’, and become an interest of society as a whole? Given the government's stance on this topic, the effort paid to research and analyse on such possibilities is highly doubtful.





THE  
*Mind*  
OF  
DR SANDRA  
CHAN

A caring psychiatrist  
who lends herself to  
her students and patients

by Emily

## Profile

Dr Sandra Chan received her MBChB from the Chinese University of Hong Kong where she is now an Associate Professor in the Department of Psychiatry and Assistant Dean for Student Support in the Faculty of Medicine. She is a Fellow of the Royal College of Psychiatrists (UK), the Hong Kong College of Psychiatrists, and the Hong Kong Academy of Medicine (Psychiatry). Her research interests lie in functional brain mapping for mood disorders, and network-informed transcranial magnetic stimulation for treatment-refractory major depressive disorder. Her research has been widely published in leading international peer-review journals.

As my colleague Jackie and I arrived at the CUHK Li-Choh Ming Building on a breezy Monday morning, we were not sure how the interview would go. Neither of us have met this figure we so often hear about in our preclinical medical curriculum for her accomplished work with the medical faculty counselors' team and beyond. We were sure prepared to listen with all ears. What makes us feel special is Dr Sandra Chan is a "senior sister" of ours, who also hails from CUHK medicine.

While we were fiddling with our camera, we heard a knock. There she was, calm and composed, greeting us with a warm smile. We shook hands and immediately felt at ease. "You guys are such professionals," she said, while searching for a spot to sit down.

Our conversation opened with a story, one of special note as it has survived years of memory. It was about one of her former students who had a psychotic breakdown during medical school. Hospitalized, but unwilling to accept his illness, he ended up deferring. "But he still believed he could go back into medical school," said Dr. Chan. After a whirlwind of struggle and receiving care overseas



that became unaffordable, he later returned to Hong Kong with the realization that he could not resume medical studies. "He still wanted to help patients in a way by becoming a facility worker at the hospital." Later, he even decided to transform his own story into an inspiration for others and had since become trained as a peer counselor and subsequently hired at an NGO.

**"The illness makes him strong," she said, almost with a hint of disbelief but also absolute admiration.**

Compared to the many tragic suicide stories we hear on TV or read about on the internet in Hong Kong nowadays, this story is laced with positivity.

Perhaps to our surprise (certainly to mine), Dr Chan clarified that Hong Kong is only ranked in the middle in terms of suicide rates. High demand in academic achievements and the "tiger-mom" culture so entrenched in Asian community are often cited as triggers for youths. In Hong Kong, suicide has become the second highest cause of death, preceded by accidents among youths and not to mention the recent waves of student suicides at the

universities. When asked about what the government has attempted to do, Dr Chan explained that a huge sum of money had been infused into research and related surveys, most notably a recent citywide mental health morbidity survey. A roadshow campaign on destigmatizing mental illness sponsored by the government also concluded with post evaluation is now underway. I heard myself uttering "really". Shocked at such initiatives from the government, yet I, a concerned citizen, did not even smell a whiff of this campaign.

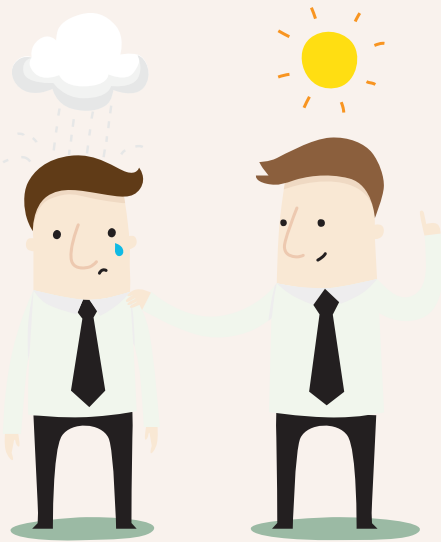
Like any other medical specialty, psychiatry is in severe shortage of doctors. Right now, psychiatrists working at public hospitals spend an average of eight minutes per patient, as reported by Hospital Authority. However, Dr Chan would choose "to talk longer with a patient who needed more time." What has been encouraging for her to see in her 20 years of practice is the tremendous support given by the allied healthcare professionals such as nurses and social workers - that everyone knows how demanding a public hospital doctor's workload can be. Throughout the entire interview, there was not one dull moment speaking with a great mind in psychiatry. The room never stopped filling with stimulating

information.

As a psychiatrist, Dr Chan does not just care for her patients at the hospital and devote her time to doing medically advanced research on devising brain models for mental disorders. She also commits to teaching and supporting students in a different capacity - as leader of the Wellness Counseling Team in the CUHK Faculty of Medicine - working in a team to integrate self-care and resilience modules into the stressful medical curriculum. "There is a misconception that a psychiatrist only hands out medicine and doesn't talk much unlike a psychologist, so students shy away from seeing one," she explained, "but that is not true." Indeed, a psychologist is not qualified to prescribe medication while psychiatrists can, for pathological problems. Private psychiatrists would just as likely spend more time talking with patients. To my tremendous surprise, I learned that CUHK University Health Services (UHS) actually can refer any student out to private psychiatrists, and later reimburse 100 percent on the hefty fees. Students may just visit a general practitioner at UHS or go through Office of Student Affairs to initiate this. It is possible many students still battle with the stigma and labels, fearful that the university or their peers find out. Encouragingly, as Dr Chan puts it,

**"You're not having a weak personality... we're here to help you tackle a new challenge."**

Whether they be emotional episodes or - simply, if you are not feeling like yourself, not enjoying the same activities anymore, no matter how long this lasts - "go see someone."



Have for yourself something of a "self-care box" with things you enjoy that lift your spirit and mood; maybe it is doing sports, yoga, hanging out with your dog, and quite literally anything that makes you happy. If these fail and you can't pull yourself out of the vicious cycle of thinking, just talk to someone and seek help from professionals at school or in the community. Alternatively, if you notice something is wrong in your friends or peers, be that person they can talk with. Office of Student Affairs and the Faculty of Medicine offer Mental Health First Aid certificate course from which you can learn to recognize the signs of mood disorders and help comfort others in need. It is not only students who have

mental illness who seek help - sometimes you just need someone to talk to - you can even bring your friends!

The art of welding compassion and knowledge appears to be mastered very well by Dr Chan. Her many contributions to the patient, student, and scientific community have resulted in many lives helped and souls comforted.

**As she recalls her old student who was a rehab patient-turned counselor, she called him "a symbol of enlightenment." I hope my fellow students out there, who may be struggling now or later, can endure and also find their own silver lining.**

When asked why she picked psychiatry as her specialty, her answer, in my summary, was "I care a lot." This lends itself to a great psychiatrist.




# THE EARTH AGAINST THE WORLD

A reanalysis of the climate change problem

by Felix



## Climate change. 2017

 In the 5th of December, 2017, a picture of an emaciated polar bear had been shared to the general public and immediately shocked the world. Ironically, the photographers had initially set out to find opportunities of capturing stunning pictures of the arctic environment. Unfortunately, when the emaciated polar bear had been spotted, no action was taken by the filming team to save the poor animal. The bear in the picture had only days to live. This is what starvation looks like. Its bold and light skeletal structure and slow enervated steps towards looking for the slightest sign of food on the rough dry lands that once used to be glittered with sea-life and water.

Comments were announced all over the world, from climate experts, animal rights activists, academics and etc. The web-post itself had been re-posted to another 15 famous social

media pages on the same day. Still, no post was effective enough to save the poor bear's life. The world was shocked over the picture of one emaciated polar bear, however the truth is multiple pictures of different polar bears, or even arctic animals have been posted on the internet countless times before. If one had simply searched the keywords "Emaciated polar bear" on the internet, one would find more than enough pictures of different starving polar bears. Despite that it is an animal, the thought of a starving polar bear is only the smaller picture. In fact, animal or human, we are all living on the same planet and subject to the same environmental consequences due to climate change. When we think of starving refugees, or meagre countries damaged by natural

disasters, we see just as many pictures of human beings as we see polar bears. As the problem darkens over the years, parts of the world may start to become uninhabitable due to rising sea levels.

In fact, the scarcity of economic supply would gradually diminish to the point that aggregate demand stands next to nothing. Decades later, the world might drastically turn into



the environmental and economic stance analogous to that of dystopian novels, a world where half of the planet has been engulfed by floods due to the climate and humanity is left to primitively fight over its depleting resources.

### An international perspective

When the phrase “Global Warming” is brought up, many different thoughts come to mind. Some may think melting ice caps, or overflowing sea levels, or even extinction of a certain species. However, others may think false information or an unrealistic dilemma. For example, contrasting leaders such as the President of the United States Donald Trump has frequently argued to “Drop Climate Change” from the international list of threats. Moreover, he even addressed it derisively as “That Good Ole’ Global Warming”. Meanwhile, the current President of the Republic of France Emmanuel Macron had contributed as much as he could through investing millions of dollars with foreign countries to promote green technology. He emphasized the importance of this from the statement “Make Our Planet Great Again”. It has been less than a year since Macron took office, and he has already pledged 30 million Euros to climate research according to The Telegraph, UK’s main media page. These contrasting approaches reveals the great disparities between different countries’ environmental agendas and makes us think of what “leadership” means in today’s age.

Nevertheless, most countries have strived to solve the problem only because parts of their regions have already changed severely due to the warming of the planet. Scientists have estimated that by 2030, up to 70 billion US dollars of coastal properties

in Florida will be at risk of inundation from rising sea levels of the east coast. Moreover, although it is not entirely accurate to correlate, natural disasters worldwide have been increasing over the years. According to an article published by The Guardian, the number of floods across Europe has



more than doubled in just 35 years. In 2016, the world saw its record high of 384 flood disasters according to the UN’s disaster monitoring system UNISDR. “That Good Ole’ Global Warming” may be a problem after all.

The questions today is, “What solution would be the most effective and at the same time feasible to solve today’s climate problems?”, and from this problem we may see that the window of opportunities is quite narrow due to the inflexibility of today’s world. In fact, every year there are several UN meetings that constitutes of over 15 major countries to discuss the current progress on climate change. In 2017, the world met twice in Bonn, Germany. Once in May and again in November to summarize the annual urban development plans and carbon emission records in each country. However, there has still been no decisive solution proposed to answer the dilemma of the Earth’s rising temperature every year.

### Possible solutions

So we come to wonder, “How has the world changed so much in the past half century compared to the millions

of years that mankind existed?”. The problem has first emerged during the late industrial era. When the discovery that electricity could be used to power things dawned upon the world, humans have invented all sorts of electronic appliances that require using non-renewable energy sources. However great it is, this scientific advance does not come without the necessary costs of environmental damage. The goal of a transition to renewable energy sources is to control the spontaneous increase of greenhouse gas emissions while harvesting enough energy to sustain the modern world’s demands. This change greatly relies on time, as its goal is to adjust humanity energy sources to a slow but clean one.

One of the popular solution used today is the transition from non-renewable to renewable energy sources. The impact that climate change has brought to the world is mainly led by uncontrolled consumption of “dirty” energy resources such as fossil fuels. But this transition is only a smaller part of a larger action known as

‘Sustainable Development’, which is the main target goal of both developing and developed countries. However, the difficulty in managing climate change is that it will not vanish in a matter of years. From scientific research the Earth’s temperature is estimated to increase continuously for decades before it is to stop. The danger of this is how far it will rise and what impacts it will cause to the planet. In order to resolve this dilemma, environmentalists have proposed to adopt ‘Sustainable Development’ plans. But its main problem is that it is not known to be immediate, instead it is a rather deterring effect.

### **So what would happen if we immediately seized every source of carbon emission today?**

If the world had unanimously halted every source that emits carbon and stayed environmentally *silent* for the time being, it would require at least 40 years for the temperature rise to decelerate. This is known as the tempera-

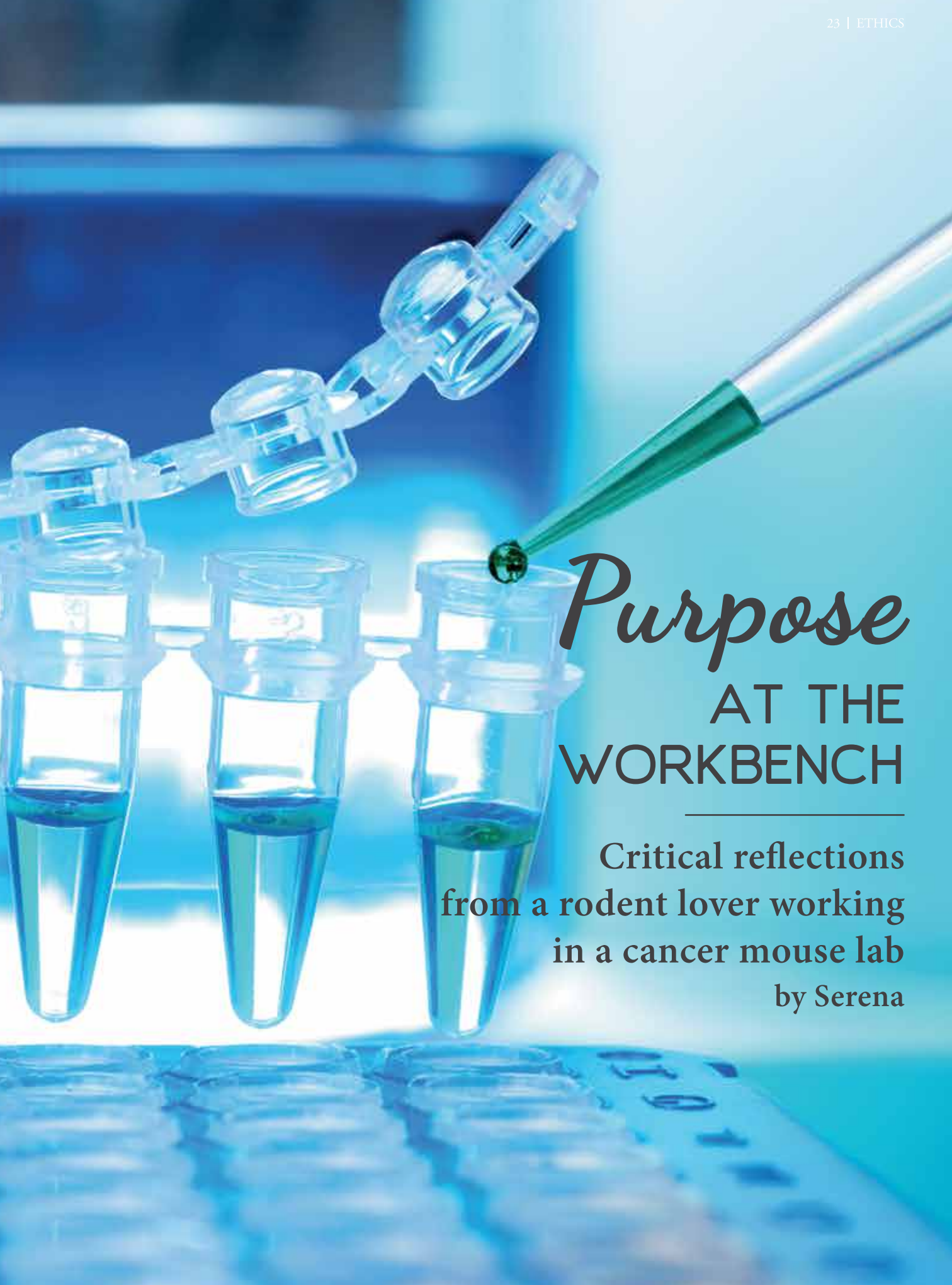
ture rise delay, according to The Conversation’s website. In other words, the planet’s temperature will rise for a minimum of 40 years before it may come to a stop. As concluded by experts in the global research field, the current set of development plans used by the world may only reduce carbon emissions by about 15% by 2030. That said, it really requires a drastic change in order to stop the “Climatic avalanche” of temperature rise. Therefore, the world comes down to two options. If the level of energy consumption can be controlled, then humanity may opt to lessen non-renewable energy resources so that the pace of energy harvest may catch up with usage. If however, consumption level can not be managed and the pace of non-renewable energy usage continues, then the planet would have to cope with higher temperature levels and more environmental disasters until the development pace of sustainable resources has finally caught up with that of energy usage. Will then, the world consider such a change?

#### **Did you know?**

- The coldest place this year was in Siberia, Russia, where the lowest temperature has reached an unbelievable  $-75^{\circ}\text{C}$ !
- Although this was only the officially reported temperature, some households had even recorded temperatures as low as  $-88^{\circ}\text{C}$ ...
- And most surprisingly, it wasn’t far from the world’s coldest recorded temperature of  $-89^{\circ}\text{C}$  at the Soviet Vostok Station in Antarctica, 1983.
- This captures the essence of climate change: it is not just global “warming”, but shows an *extreme* of temperatures at both the high and low end. Such fluctuations do great disruption to human and animal livelihood.







# *Purpose* AT THE WORKBENCH

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Critical reflections  
from a rodent lover working  
in a cancer mouse lab  
by Serena

## Did someone say GUINEA PIG?

**P**uffy, was my first guinea pig. A sheltie breed with long brown locks and a splash of white on his face.

He weighed a wee 750g, which is embarrassing considering his two lady friends tipped the scales at 1300g. This size inferiority did not deter him in his reproductive efforts and he sired five babies, one of whom was the spitting image of himself thus earning her the name “Minipuff”. So began my love affair with guinea pigs for the next nine years; I adore them. I am that person at the grocery store picking the top quality organic tomatoes, and not for myself. I am the person who bought a heater not for the humans in the household but for the pig room. If anyone were to glimpse our PayPal bill they will be confronted with expenditures of confounding names such as “Piggy Palace”, “The Cozy Cavy”, “Gorgeous Guineas”. My love for guinea pigs extends to all members of the rodent family, including hamsters, gerbils, mice, rats, chinchillas....and my voice rises three octaves when a conversation with friends touches on any of these animals.

### At a Berkeley Lab

In the past semester, I had the valuable opportunity to work at a laboratory in University of California, Berkeley, researching the role of non-coding RNA as a suppressor of cancer metastasis. This was a rigorous environment that put me, as my first PI calls it: “in the world of real science”. I spent many hours extracting DNA, genotyping, running gels, embedding tissues and cloning recombinant DNA. This involves working with both bacterial and mammalian cells.



*Left: Minipuff, Right: Puffy*

It also involves working with mice.

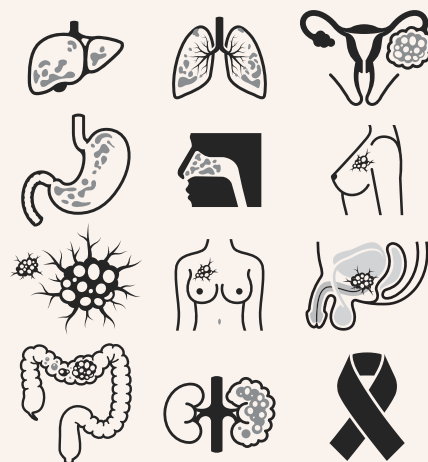
So began a critical thinking process in my mind to reconcile two immovable passions: scientific research and rodents. Prior to this, thoughts of laboratory research on animals made me cringe, and as I witnessed mice being inoculated with substances that induce cancer I felt a strong sense of discomfort. However,

**life is not about avoiding discomfort, but facing facts, understanding the multifaceted sides of issues such as using animals in research, and then finding your place, and a purpose.**

For me, this process included taking a course on the Institutional Animal Care and Use Committee’s (IACUC) rules and regulations, talking to animal care staff at the facility, personally working in the mouse room and perhaps most significantly: breaking down the research process to its core and appreciating just how indispensable is the laboratory mouse.

### Medicine is a logjam without scientific research

Before we address ethics and regulato-



ry issues, it is sensible to first understand why mice are used in cancer research. Indeed, justifying the “why” logically precedes its subsequent “how”. I will make the argument in the context of cancer research, which relies heavily on transgenic mouse models.

In 2015, malignant neoplasms was the leading cause of death for both male and females in Hong Kong, responsible for 32.3% and 28.5% respectively of all deaths. Public health priorities stipulated by the Center for Health Protection include the prevention and control for noncommunicable diseases, where cancer tops the list. While Hong Kong prides itself with one of the highest life expectancies in the world, this ageing population will only increase the disease burden imposed by cancer. In this respect, a doctor’s capabilities are limited. They can treat, but they cannot always cure

cancer. They rely on scientific discoveries that uncover new signal transduction pathways which elucidate upon novel drug design or more effective treatment methods. Here, we need to understand that cancer is primarily a genetic disease. You do not “catch” cancer; you *develop* it. These signaling “pathways” that have gone awry in cancer patients are built into them at the level of the gene, so studying the disease entails manipulating DNA in organisms to model the disease.



Among the well established model organisms such as the budding yeast (*S. cerevisiae*), nematodes (*C. elegans*) and fruit flies (*D. melanogaster*) in genetic studies, mice are unique in that they are mammals and share 95% of their genes with humans, which provides us with an *in vivo* study of cancer development. These transgenic mouse models enable us to recapitulate many endogenous tumorigenesis processes through targeted gene knock-outs or knock-ins. In addition, mice have an average lifespan of two years due to their high metabolic rate. As a result, they have a naturally accelerated molecular clock that enables disease processes to be expedited - effectively speeding up research.

### “Alternatives” is not an option

I remember sitting in bioethics classes where they listed different methods for drug design. The list includes items such as cell culture experiments, computer simulations and animal models. This gives the illusion that scientists actually have options, but the reality is that the former two

methods merely supplement but do not replace the need for animal experiments. The complexities of drug metabolism and pharmacokinetics in a physiological environment is impossible to simulate with computers regardless how advanced or “accurate” the program is, and cell cultures are a far stretch from the mammalian body. One simple example is the oxygen concentration: in cell cultures it is the same as the atmospheric oxygen level of 21%, while physiological levels are less than 5%. Therefore, tumor cells in cultures undergo oxidative stress and enter senescence (the process by which cells enter cell-cycle arrest irreversibly and no longer divides). Therefore, the culture ceases to serve its research purpose.

One example of a promising achievement in cancer therapy initially studied in mice and successfully tried in humans is that of immunotherapy. Coined recently by both Nature and Science as the “breakthrough of the year”, this is a method by which the cytotoxic properties of the body’s immune system (specifically, T lymphocytes) are harnessed to fight and eliminate tumor cells. When double knockout mouse models were generated at the RAG locus which renders them deficient in B and T cells, these mice had a higher incidence of tumor development. Further testing in mice showed that blocking certain “immune checkpoint” receptors on T cells with monoclonal antibodies led to tumor rejection. This shows that the immune system is the body’s valuable endogenous defence against cancer. This crucial finding paved the road for scientists to develop Checkpoint Inhibition Therapy in advanced melanomas which proved to have long

term effectiveness in 20% of patients. Therefore, I want to clarify again that when it comes to cancer research, “alternatives” to animal models are disproportionately outweighed. Cell cultures do not even have an immune system. In fact, all FDA approved cancer drugs that enter human clinical trials must first be tested for safety in animals. Hence, as a rodent lover, I nevertheless come down firmly in the camp which supports the use of mice in cancer research, without which it is



*Misconception vs. Truth*

impossible to make significant progress in such a complex, monstrous disease. Having resolved this in my mind, I focused the rest of my attention at Berkeley on the regulations put in place to ensure both fair and just treatment of said mice.

### Be fair, before you judge

I do not deny that there are research institutions that mistreat animals, but as an undergraduate researcher who worked “behind the scenes”, I also want to portray a more wholesome picture and show that when stringent measures are put in place, the conditions facing a laboratory mouse is not what horror photos on animal rights websites necessarily reflect. I do not say this lightly: this is a particularly sensitive issue to me. Previously, I’ve always found any concept of breeding animals as disease models, confining them to cages and injecting chemicals into them, unbearable. Yet, it is important not to make generalisations

and label all institutions that conduct animal research as “inhumane” or “cruel”. In fact, the spectrum of compliance to animal use and care standards is broad, and I am confident in saying that institutions such as UC Berkeley falls firmly at the higher end.



UC Berkeley has the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) seal which ensures research institutions comply with animal use and care guidelines stipulated by the US Department of Agriculture (USDA), the Animal Welfare Act (AWA) and the Policy On Humane Care and Use of Laboratory Animals Policy by the Public Health Service. According to their website, the AAALAC’s mission is to “enhance quality of research, teaching, and testing by promoting humane, responsible animal care and use”. These are not big words, but manifest in firm action. By firm, I mean if compliance rates drop below a threshold, the IACUC regulatory body at UC Berkeley: The Office of Laboratory Animal Care (OLAC) can, and have, halted the entire lab’s research for up to six months. A death blow to the lab. OLAC takes their responsibilities in upholding the rights of research animals seriously, and really, this is the very least we ought to do. After all, in the words of IACUC, “you are asking for the privilege of using animals for procedures that rarely will benefit them individually and might result in their

deaths”.

### Husbandry

Under OLAC, there is an entire department that exists solely to ensure researchers comply with regulations for humane and responsible animal husbandry. This manifests in very specific examples such as limiting the number of adult mice per cage to no more than five. Cages are inspected by OLAC staff everyday, whenever an overcrowded cage is detected it will be marked down, and penalties apply when a certain number of “overcrowded” records is breached. Cage conditions are also checked daily for leaked water bottles that have flooded the floor to prevent the mice from catching hypothermia. Mice are inspected individually for fight wounds where antibiotics are given, for overgrown teeth which are trimmed, and for hunched postures that indicate pain of which the animal is euthanized within the day. Below is an email sent out by the director of OLAC regarding weaning mice (separating mice from their mother), which is a time where the pups make the transition from feeding from their mother to eating solid food:

“Young mice are not real bright when it comes to knowing how to find food and water and thus have to be educated. At 14 days of age, we highly recommend placing moistened pelleted food on the floor of the cage (see your area supervisor for food). This way, they are slowly introduced and mom is still there to provide sustenance. When you wean at 21 days, they know the purpose of that food and can maintain themselves better. Continuing this practice for a week before weaning and the week after weaning will ensure a healthy litter.”

The detailed attention paid to every developmental stage of the mouse is

clear. After all, these animals do not have a voice, and as I read this message in my inbox, I felt deeply grateful we have such members of staff who considers every aspect of the mouse’s welfare.

From the perspective of the researcher, it is also in their interest to house animals in a clean environment with minimal distress. For example, an overcrowded cage may give rise to fighting, wounds and stress which could activate or suppress the immune system, while a dirty cage may cause skin or respiratory problems that induce inflammation, all of which introduce variables into their experiments. This is particularly undesirable as cancer development is intimately linked with immunological mechanisms. Moreover, I observed that respect and care for the mice is not a product of negative reinforcement, but a genuine mindset among the graduate students and postdoctorals. This has been encouraging to witness and reaffirms my faith in good research ethics.

### When to stop

“Endpoint criteria” is when research causes unnecessary pain or distress, giving the animal care staff grounds to euthanize the animal or remove it from the study. This could include a limit on weight loss as a percentage of body weight, size of tumor as a percentage of body weight, inappetence for more than three days and pain or distress that cannot be controlled by analgesics. I observed first hand some of these procedures which were carried out with minimal distress to the mouse. If one should question what is the standard against which broadly defined terms such as “pain” or “suffering” is judged, the answer from the IACUC is:

“A simple yet useful definition of a painful or distressful procedure on an animal is this: A procedure that would cause pain or distress in a human”.



In other words, laboratory mice are treated no more inferior to their human counterparts in experimental parameters such as pain thresholds.

### Better choices

Peyton Rous, discoverer of the first viral oncogene, said in his 1966 Nobel Prize acceptance speech: *“tumors destroy man in a unique and appalling way, as flesh of his own flesh which has somehow been rendered proliferative, rampant, predatory, and ungovernable”*.

**It is a cruel design of nature to be confronted by and perhaps ultimately succumb to “flesh of our own flesh”, and in the decades that since elapsed, what we do understand about cancer is perhaps rivalled only by all we still do not.**

In light of this, I argue that the discussion of our time has moved beyond whether or not animals should be employed in cancer research, but

rather in establishing the strict regulations such as those observed at AAALAC accredited laboratories that uphold the value and sentience of an animal’s life; so that they are used, but not abused.

After working four months here at UC Berkeley, I realize that despite being emotionally swayed by evoking images of grotesque animal experiments on websites, they are not representative of every laboratory. In the real world, the plight of animals used in research can be worse...but it can also be better. If you are a science major like me venturing into the field of research that involves the use of animals, and if you are also an animal lover like me who feels conflicted by

what this entails, perhaps start by researching what animal care and use regulations are put in place at your potential institution, and look for quality accreditation seals.

Bear in mind that just as there are better laboratories; there are also better choices.



*A promise to respect...*

# WELL-POISED

Understanding daily life through the lens of liveability and sustainability

by Lok Ping



**“Heaven on Earth is a choice we must make, not a place we must find.”**

said famous author Dr. Wayne Dyer.

Like “striking a work-life balance”, “sustainable development” has been a cliché since the late 1980s.

While people are brought to talk over and over about improving their standard of living and the sustainability of community and the environment, little has been discussed regarding how these are to be achieved altogether. Indeed, many people have started caring less about merely attracting growth and more about how to manage growth towards a positive end; yet, without truly understanding the conceptual linkage between liveability and sustainability, one can hardly make a fundamental shift in mindset from city as growth machine to a “liveable” and “sustainable” one.

## Defining sustainability and liveability

*Sustainability* is an elusive concept.

The Brundtland Report defined it as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Many criticised this definition for its ambiguity on “future needs” and its anthropocentric assumptions. Later, scholars such as David Maddox refined sustainable development to be a mix of interests of economics, environment, and social equity.

*Liveability*, by contrast, is a more practical and operational concept. It



focuses on immediate and tangible conditions. Despite being subjective, liveability is a prerequisite for the integrity of a sustainable community, because people would

otherwise leave if this is not liveable. The concept positively affects the experience of a place, thus promoting the wellbeing of individuals in a community.

## Conflict and complementarity

While consensus on concept definitions is critical to advance practice, the linkages between liveability and sustainability should deserve equal attention.

*Conflicts* occur when it comes to discussing the practicality of concept implementation and the concern on intergenerational needs. The notion of sustainability is contradictory to liveability because it often fails to go beyond normative theories to application. Also, liveability promotes remedies to existing conditions, while sustainability focuses on intergenerational equity which sometimes requires compromise from the present generation. For example, to reduce greenhouse gas emission, people in California, Florida, Oregon, and Washington are encouraged to drive less, causing them trouble travelling. This apparent conflict is the main obstacle in implementing sustainable projects. In other words, the goal of sustainability is eroded away by on-the-ground impracticalities, which render sustainability projects unable to move forward. This “conflict” is the traditional view taken by those who consider these two concepts incompatible.

But we can still find *complementarities* between the concepts. While liveability needs sustainability to provide frameworks for future investments, sustainability needs liveability to carry

out potential plans for urban planning from below. Besides, liveability needs sustainability to promise economics, environment and social equity among various stakeholders, while sustainability needs liveability to change behaviours of certain local stakeholders.



### Liveability as a device for sustainability

**In fact, liveability is not just a complement of but also a mechanism towards sustainability.**

Liveability, as a subset of sustainability affecting the people in a community directly, serves as a device to sustainability that helps achieve long-term sustainability goals in three ways.

Firstly, liveability inspires positive changes to local communities, whose members would be more open-minded to planning interventions. At times people are reluctant to change, but it is changes that bring human progress. Liveability has an intrinsic meaning of making changes to make people live more comfortably. The concept of liveability can fragmentise sustainability goals for easier adoption at the local level. Policymakers can set incremental goals to achieve long-term sustainability goals in terms of enhancing liveability. For example, it is hard to convince people of the vision of improving pedestrian design; but easier when we say we want to make a local neighbourhood

walkable. This is how liveability can vehicle sustainability in terms of encouraging changes.

Secondly, liveability closes the spatial gap between the public and the individuals. Humans have multiple identities. We can be either the public or a group of individuals. When talking about sustainability, we address issues about resource depletion, overpopulation, urban resilience, etc. These issues are considered at a broader spatial scale, in which people's role is "the public". In contrast, when talking about liveability, we normally address issues such as road traffic safety, efficient local mobility. These issues are more relevant to people's daily life when people are "a group of individuals". Usually, people view their own benefits more importantly than others' and are rather indifferent about social participation. Liveability is in favour of this mentality, which promotes awareness of local people in their living environments.

Thirdly, liveability concerns can direct and alter long-term sustainability goals. Sustainability is a long-term ideal. It seldom changes after the framework is set, as reflected from the present framework of economic-environment-social equity nexus. By contrast, liveability is more dynamic in nature. It responds to changing circumstances by providing changing solutions. Not only do the changes impact on people's way of thinking, they also impact on how sustainability is framed and revised. For example, if traffic jam occurs more and more frequently, transportation will be on top of the agenda, and when people realise incremental

remedies cannot help, they will look for a long-term answer that happens to address sustainability concerns; if more people report on extremely dry weather conditions in summer, sustainable use of freshwater may be put on the table as well.

When the right approach or attitude is adopted, the synergistic effects can be rewarding. Liveability and sustainability should not be viewed separately, as either of them is in a position to harm or contribute to the attainment of the other one.

### Opportunities and challenges

We are poised in a uniquely optimistic position in the 21st century: with the advancement in telecommunication technology, citizens can express their concerns on sustainability and liveability issues on online platforms. This places a "positive pressure" on corporations to re-examine their energy consumption and rebrand. Also, companies' involvement has increased drastically after they saw business opportunities in it. Some of them even assume leading roles in sustainability progress, such as Shell, which helps local people recover from crisis and transforms their communities and empowers them to help to conserve the environment. Shell also published their Sustainability Report reporting voluntarily on their environmental performance since 1997 to outline



their contribution to sustainable development. Corporations like Shell are taking the lead for other multinational corporations to follow suit in the march for a more sustainable future. This helps to create a ripple effect in others' lives.

However, sometimes an ironic situation happens—it takes initial resources to reduce resource consumption. For developed countries, they have resources to install the solar panels and build the windmills in order to save non-renewable resources. However, to developing countries, they do not want to spare resources for developing renewable resources so they resume using traditional ones where the costs are lower. This poses challenges to sustainability if we only resort to market mechanisms when handling issues that affect the achievement of sustainability.

### How to turn challenges into opportunities?

“Megacities, mega-challenges” is a very important urban sustainability issue. Mega-challenges ranging from waste treatment to traffic jams come along with the expansion of cities. The negative experiences in megacities lower its liveability. The concentrated population also induces health and environmental issues that hold back cities' pursuit for sustainability as well as liveability.



Although megacities sound like unpleasant places to reside, we can

turn these challenges into opportunities as most resources are usually made available for megacities, and they are often under the spotlight when considering implementing policies. For example, we can encourage industries to make profits from recycling to balance between economic development and environment. We can also promote walkable neighbourhood, which enhances interconnectivity between families and reduces usage of cars which causes traffic jams. It is critical to identify ways to turn challenges into opportunities in order to make liveability a part of a sustainable community and society.



### Zooming in on Hong Kong

Design and consultancy firm Arcadis's Sustainable Cities Index 2016 ranks Hong Kong as 16th in the overall Index and 81st in the People sub-index, and second in the Profit sub-index. Hong Kong is, beyond doubt, a convenient place to live and the best place to do business; but when it comes to protecting the environment, definitely more has to be done.

The Arcadis's Index ranks 100 global cities on three dimensions of sustainability: people, planet and profit, which represent social, environmental and

economic sustainability respectively. In the 2016 Index, Hong Kong ranked 29th in the Planet sub-index, coming behind Singapore (12) and Seoul (26). The Planet sub-index assesses cities' performance on energy consumption and renewable energy share, green space within cities, recycling and composting rates, greenhouse gas emissions, natural catastrophe risk, quality of drinking water, sanitation and air pollution. It is not surprising that, as one of the planet's most densely populated cities hosting more than 7.3 million people, Hong Kong faces challenges ranging from limited public space, growing popula-

tion, ageing population, and a rapidly increasing cross-boundary traffic with China. These challenges seriously hinder Hong Kong's drive for environmental sustainability.

Has Hong Kong been doing anything in face of the challenges to sustainability? Not really. Instead, more controversial public infrastructure projects are set to begin or will be finished in the coming few years. These projects have all raised public concern on various environmental issues. For instance, Hong Kong International Airport, currently operating at

99% capacity, is undergoing construction of a third runway, which is due to open in 2024. The construction has done considerable damage to coral reefs and Chinese white dolphins living in the





waters near Lantau Island. Another controversial project - the Hong Kong-Zhuhai-Macau Bridge - was originally scheduled to open at the end of 2017 but was subject to delay again. The bridge is meant to facilitate more economic exchanges between Hong Kong and the Pearl River Delta. However, the construction has constantly led to concerns among civil society groups that vehicles coming from China will bring more air pollution in Hong Kong.

### Key perspective: engagement

Given all these challenges, how can the pursuit of liveability help to drive sustainability in Hong Kong? Engagement is the key. Public engagement is crucial in putting the concepts of sustainability and liveability together. Governments can propose solutions to urban problems that reconcile the concept of sustainability and liveability, encouraging people to blend in the community through social engagement as they collectively determine

the lifestyle shared by members of that community. This contributes to making places more liveable, thus bringing elusive sustainability goals down to earth. People have the rights to articulate what liveability means to them, though different from community to community. Ultimately, local solutions can contribute to global urban planning discourse, and be re-localised elsewhere. Liveability and sustainability should be viewed in the same context, and plans that sacrifice sustainability must be reviewed

carefully. After all, liveability and sustainability are, in fact, two sides of the same coin.

#### UGFN Box:

#### Rachel Carson's Silent Spring

The 1950's saw an age of massive and indiscriminate pesticide use in the post-war boom of the synthetic chemical industry. Carson was one of the earliest modern conservationists to advocate for nature (who has no voice), whose influence on environment protection has persisted to this day. Today, we continue to face the challenge of striking a balance between satisfying the needs of running a society, and its long term sustainability. After all, nothing is worse than too much too late.



*Sustainability creates a condition under which humans and nature can exist in productive harmony.*

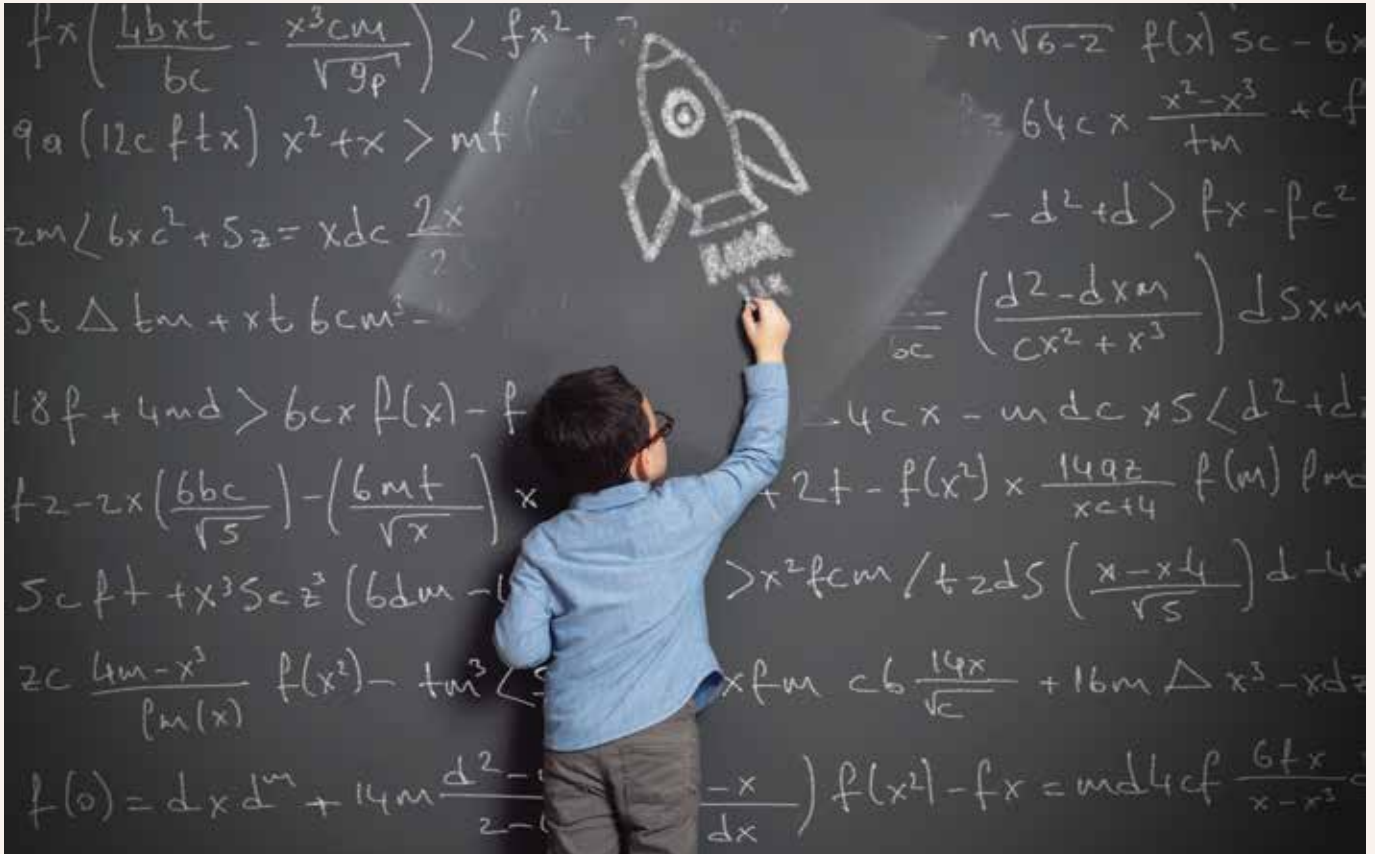
# *Take Me To The Moon :* BOY-DREAMERS AND A MEGA-ROCKET

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Two space engineers,  
a common passion,  
and a date with history  
by Philip H. Kitchens



*In the U. S. a 'rocket scientist' is a label sometimes used socially to loosely refer to an engineer involved in rocket development. In this article the author presents the story of himself as a then-future rocket scientist and shows how curiosity has played roles for him. I relate how a very famous rocket scientist, Wernher von Braun - also a very curious person - came into my life and served as a powerful inspiration for me. The reader will see that we had similar life paths for a number of years.*



## My youngest years

As a youth my long-standing fascination with aerospace began with a very early interest in astronomy when I acquired a small telescope in the years 1952-1953. I viewed Jupiter and its satellites, Saturn and its rings, and some galaxies. The moon must have deeply stoked my curiosity about the universe and what it might be like to travel there (in the mind). I kept a personal-observation log with crude sketches. Gradually my interest in astronomy expanded to include aviation. I made a trip to the nearby Air Force base and may have taken a flight in an aircraft there. As a very young student, I was fascinated with, and probably inspired by, my fourth grade science teacher. I remember asking her about electricity:

“Does voltage or current kill a person?”. Her response likely fanned my interest in sciences. I also had curiosity in watching fireflies and capturing chameleons.

## First interest in aviation

As a youngster I became interested in model aircraft made of balsa. My airplanes had rubber-powered propellers, as opposed to gasoline engines, some being ready-to-fly but most requiring careful assembly with glue and tissue paper. Some flew reasonably well, but others didn't! It was also fun flying kites - - except when one found its way into a tree! Did fascination with kites precede aviation, or just the reverse? I can't be sure.

Reading local newspaper articles enabled me to stay informed about

American developments in balloons, aeronautics, and experimental rocket-planes. Libraries very early played a key role for me, even if I wasn't fully aware of their significance until much later. Each summer I regularly visited the nearby “bookmobile” to find new books to read. In the local public library, I thumbed through the card catalog there, searching for “space books”, one being German spaceflight enthusiast Willy Ley's. There were occasional articles about man's future travel into space and these escalated my interest accordingly. It was about then that I first became familiar with von Braun's name and his work. He rapidly became my idol.

## Who was von Braun?



*von Braun, Director of NASA Marshall Space Flight Center, in portrait-photo, as he appeared about 1969 (NASA Photo)*

Who was Wernher von Braun? Most informed persons would likely place von Braun above almost all other rocket pioneers, except perhaps the American, Robert H. Goddard. Much has been written about von Braun and his life. Born in Wirsitz, Germany, in 1912, von Braun early on showed very strong curiosity, primarily in astronomy, ignited by his mother's gift of a small telescope. He doubtless imagined other worlds, but viewing the moon and some planets, especially Mars, likely fired an emerging passion not only for knowing about those bodies, but someday traveling to them.

Von Braun headed a large German army rocket development organization at Peenemunde, near Denmark, from 1937 to April 1945. After the war many of von Braun's "team" worked on American-government missiles in New Mexico before relocating to Redstone Arsenal in Huntsville, Alabama in 1950. After NASA (National Aeronautics and Space Administration) was established in 1958 von Braun and his team transferred to the Marshall Space Flight Center (MSFC) closeby. When President Kennedy so dramatically

declared in 1962 that: "We choose to go to the moon... not because it is easy, but because it is hard." von Braun then applied his leadership toward putting man on the moon.

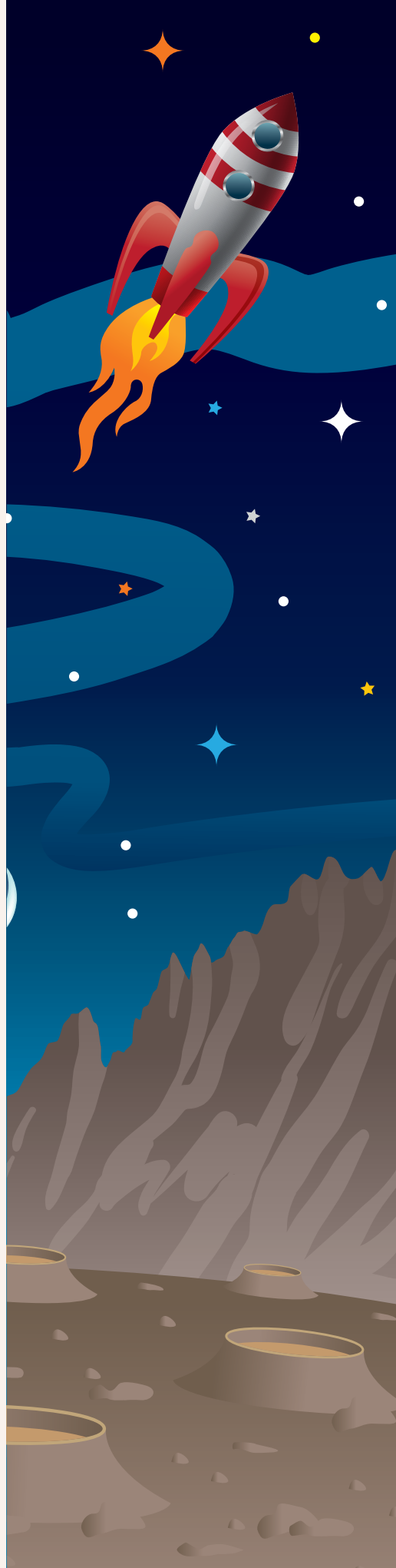
As director of MSFC, von Braun was an amazing manager. He regularly challenged his staff with personal "action notes" for them. He was not only an incredible technical genius, but also a strong advocate for his workers' success. Off the job, von Braun was versatile: pilot, scuba diver, author, and musician. His spoken English was of good quality, but kept a somewhat thick accent.

### The coming of spaceflight

Temporarily von Braun remained on the edge of my life. In junior high school I entered a science fair with a plastic model rocket. But new drama came October 4, 1957, when, on the playground, someone said that Russia had launched its "Sputnik" artificial satellite. My interest in aeronautics, now including spaceflight, was then fired even more. My courses in high school included a healthy "dose" of math and science, including chemistry. Nearing graduation, I pondered what to study in college. With no aerospace curriculum available locally, I chose chemical engineering (Ch. E.) instead.

### College days and the growing flame in me

Entering Louisiana Tech University, I now had a burning passion for an aerospace future. As a student I wrote an article about Saturn launch vehicles for the engineering college's magazine. On January 27, 1967, I was shocked and deeply saddened to hear that my heroes, astronauts Gus Grissom, Ed White, and Roger Chaffee, had died in ground-testing a new spacecraft and had become symbolic of my spaceflight passion. Nonetheless, I didn't lose my zeal to be part of Apollo. In my senior year I



interviewed with a NASA representative. I didn't realize that my application for work at MSFC would be approved shortly. Before that, however, something else, just as wonderful, was coming - an opportunity to meet Dr. von Braun in person!

### **von Braun mesmerizes his audience**

My father could see my evolving interest. He acquired tickets for me to attend a dinner in February 1967 featuring my idol, von Braun, as speaker. I became quite excited about the prospect, yet I could not adequately anticipate the exhilaration forthcoming. At the dinner, I found von Braun to be outwardly robust and physically somewhat heavyset. At age 55, with immaculate business-suit dress, his eyes and dark hair commanded one's attention. One might have thought that he was a person of royalty somewhere! He held a very prestigious NASA position and had made many pioneering contributions to rocketry. Now he was going to describe his work and its meaningfulness!

von Braun addressed Apollo, NASA's national program to land men on the moon. Immediately capturing our attention, he kept us fixated on him as he progressed. He first outlined Apollo, assuming that we knew rather little of it. As he unfolded details about this unprecedented NASA project, I and others could easily detect his natural personal passion for it.

Apollo, he said, would take years to accomplish. The program essentially consisted of the Apollo "spacecraft" per se and the rocket to lift it into space, the enormous Saturn V "launch vehicle." (For clarification, the spacecraft is the flight hardware in which the astronauts would live and carry out the mission. In aerospace lingo a rocket is traditionally called a

"launch vehicle." It would serve to lift the spacecraft, with crew inside, into orbit.). von Braun was spellbinding with the details. After his introduction, he focused on Saturn V, for which he held a critical responsibility at MSFC. Along the way, von Braun demonstrated his astounding capability for making such a complex technical subject comprehensible to the layman. Indeed he seemed to have a knack for doing so, using comparisons to make his explanations understandable.

Saturn V would have three physical "stages" (sections). For each of these, von Braun first gave the basic facts about it and explaining how it would operate. The rocket, he said, would carry a 100,000-lb. spacecraft with crew of three into orbit around the Earth and then on to the moon. He illustrated his talk with examples in simple numerical terms. But he cautioned that he didn't expect us to readily comprehend the technical complexity and immensity of the rocket. So he gave us familiar everyday examples to make the otherwise unfathomable rocket easier to appreciate.

As a first illustration, von Braun revealed the staggering size and power of the F-1 engine in the rocket's first stage ("booster"). The 32,000,000-horsepower (hp) engine, 18.5 feet high and 12 feet in diameter, he said, would produce the equivalent of about 15,000+ hp. per cubic foot of its "envelope" (three-dimensional space). This, he said, by comparison, would be about 2,300 times the power of a 350-hp. V-8 automobile engine on the same per-cubic-foot basis. Yet there would be FIVE such F-1 engines in the booster, for a total liftoff power of 160,000,000 hp. to lift the 6,477,000-lb. vehicle! Now that was something the layman could relate to! (Each F-1's pumps could empty a swimming pool 50 ft. x 30

ft. x 8 ft. in 137 seconds!)

When von Braun had finished, we were all dumbfounded and thoroughly impressed. Knowing that I had become enthralled by von Braun's charisma, my father then led me to the podium where a photographer was snapping away. The photographer kindly made a picture of him, my Dad, and me. Later von Braun wrote to me, enclosing the photo - autographed by him - and thanking me for the opportunity to meet him. The letter and photo would become lifetime treasures!



*von Braun ponders a technical matter in the countdown for a Saturn launch while monitoring progress of preparations at the periscope (NASA Photo)*



*von Braun and colleagues share a lighter moment in the launch control center at Kennedy Space Center, July 16, 1969, apparently celebrating the successful launch of Apollo XII! (NASA Photo)*

## A new engineer reports to MSFC

As an engineer arriving at MSFC in August 1967, I found special meaning in realizing that my life's path was becoming rather similar to von Braun's own. I worked first in a chemistry lab, conducting flammability (burning tendency) tests of polymeric materials for spacecraft material safety. Not being familiar with the advanced equipment, I had to make an immediate adjustment. In November 1967 Saturn V was flown for the first time on a test mission. It was spectacular; it even substantially emotionally "rattled" CBS-TV journalist Walter Cronkite in his reporting the liftoff. In a letter to my parents, I said "I felt like running to work today!"

Subsequently I transferred from materials testing to Saturn rocket propulsion to be closer to the activity I'd always wanted. My propulsion engineering assignments related to the awesome F-1 and its use in a five-engine, 160,000,000-hp. "cluster" in the Saturn V's booster. I learned details of the F-1 and how to evaluate its performance in ground testing and in flight. This meant learning about "turbopumps", valves, start sequences, exhaust nozzles, and use of certain "propellants"<sup>[1]</sup>. It is noteworthy that the state of the art for engineering calculations then was the "slide rule." Under von Braun,

**knowing that I was just one of 7,000 MSFC employees and 400,000 persons working to make Apollo successful didn't bother me; it was too important to tell myself that I was now contributing to a project unprecedented in history!**



## Experiencing the launch of Apollo XI

The Apollo program reached a dramatic climax in July 1969. Since President Kennedy in 1961 had committed the U. S. to "landing a man on the moon before this decade is out," Apollo had captured the national focus. Two previous Apollo missions had flown around the moon, but not landed men on the surface. Besides the technical complexity of the landing mission, there was a strong element of daring and boldness! There had been successively greater technical challenges to surmount; indeed, only five preparatory Apollo missions had been flown with the awesome Saturn V! The nature of the landing mission thus meant many potential dangers, one being Saturn V with its huge load of explosive propellants. Apollo XI would thus be a most gripping, attention-getting undertaking because the President had mandated that the U. S. would accomplish its goal by the end of 1969. The American motivation was to achieve prestige in the Cold War with Russia through technological superiority. But NASA had to do so successfully and safely!

At Kennedy Space Center, Florida, on the epic-making day, I was fortunate

to eyewitness that history-making liftoff<sup>[2]</sup>. Having arrived by bus in pitch dark with other MSFC engineers, I waited for the last hours of the countdown to reach zero. Only some crowd murmurs broke the silence, along with occasional loudspeaker announcements from the launch control center (LCC). Regrettably some scrubs partially obscured my view of the vehicle.

The countdown clock slowly began to "move" (advance) faster, then accelerated as key milestones were announced by Jack King, NASA Public Affairs officer in the LCC. Propellant loading, or "tanking", of liquid oxygen and kerosene (fuel roughly like diesel) was completed. Power was transferred to the vehicle, and, in turn, the flight-guidance software. The vehicle went onto automatic sequence (onboard computer control). The crowd murmurs vanished as anticipation rapidly increased. At T-50 seconds, my heart was pounding hard; the countdown clock was now rushing down toward zero! (The "T -" represents amount of time before liftoff; "T +", the time after liftoff). I became fiercely intense as my attention focused on the pad (concrete-steel support for the vehicle); I ignored the heat of the very warm sun. King continued, adding to the tension: "...30 seconds and counting...T-9, we have [booster] ignition sequence start...4, 3, 2..." As the F-1's ignited and reached full power, an eerie total silence yet reigned all around!



*Apollo XI vehicle (AS-506) lifts off, Kennedy Space Center, Florida, July 16, 1969 (NASA Photo)*

## **I could imagine the 363-foot-tall giant erupting from a deep slumber in a torrid gush of smoke and flames.**

It was exactly 9:32:00 a. m. E.D.T., July 16, 1969. What follows defies easy description and was soul-stirring for me. Suddenly, without warning, an incredibly ferocious succession of sound waves rolled through, literally beating upon us in the spectator crowd. From 3.75 miles away (safe blast distance), the rocket's exhaust

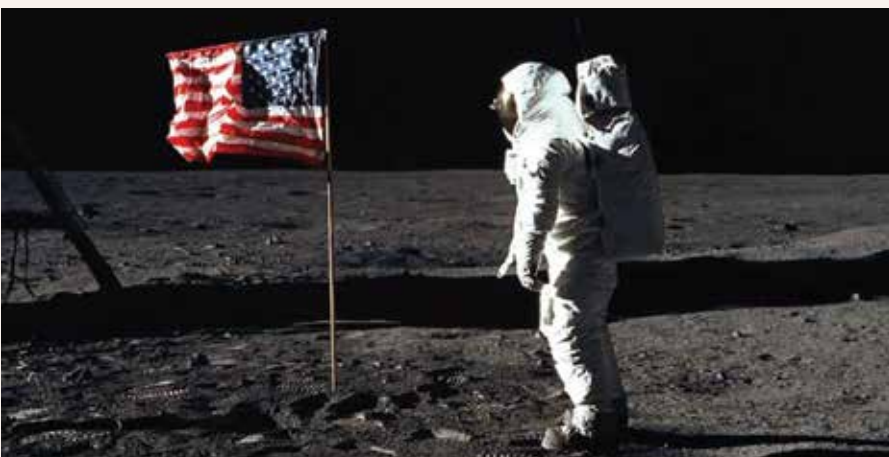
was the loudest man-made noise ever (except for the atomic bomb)! The vehicle ascended, climbing until lost in clouds. A huge pall of grey smoke hung over the pad. A jubilant group of MSFC engineers, including me, slapped each other on the back. Man would finally walk on another world. Some 500,000 to 1,000,000 people had seen the launch! I and some 600,000,000 other people worldwide watched the astronauts land on the moon, via television July 20.

von Braun was soon transferred to NASA Headquarters; I did not have the opportunity to meet him personally a second time. After Apollo XI, I

enrolled in graduate study to become a better rocket engineer. After the program ended, I returned to graduate school, becoming a professional librarian.

### **The story comes to an end**

In retrospect it has been amazing how curiosity has worked in me, triggering new discoveries, which then brought new knowledge and further guided me. Throughout this personal approach to learning, reading has played a huge role, always triggering more curiosity. I thus strongly encourage an active, lifelong reading habit in others.



*Astronaut Neil Armstrong photographs Astronaut Buzz Aldrin on the surface of the moon, at "Tranquility", the name for the Apollo XI landing site, July 20, 1969. (NASA Photo)*



**Explanatory notes:**

- [1] Propellants include fuels and oxidizers; turbopumps force the propellants into the combustion chamber to produce power.
- [2] The author has written a separate personal account as an eyewitness to this event in Florida for the 25th anniversary (1994) of the launch of the lunar landing mission, Apollo XI, on the AS-506 Saturn V vehicle. It is titled: "Liftoff to the Moon." (Please see selected readings below)

**Selected Readings:**

Kitchens, Philip H. "Liftoff to the Moon." *The Bent of Tau Beta Pi*, Summer 1994, pp.20-21 [author's personal account of the Apollo XI launch].

Stuhlinger, E. and Ordway, III, Frederick I. *Wernher von Braun, Crusader for Space: A Biographical Memoir*. Malabar, FL: Krieger, 1994.

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von Braun, Wernher. *Space Frontier*. New ed., completely rev. and updated. New York: Holt, Rinehart and Winston, 1976.

**About the Author:**

Mr. Kitchens earned his BSc.Ch.E. (Chemical Engineering) from Louisiana Tech University, MSc.M.E. (Mechanical Engineering) from the University of Alabama, and M.L.S. (Master in Library and Information Science) from Louisiana State University. While at NASA Marshall Mr. Kitchens conducted research on fire safety for the Apollo spacecraft and performance evaluation for Saturn launch vehicles. Elsewhere he has also worked on air and water pollution and solid waste disposal. Mr. Kitchens headed the engineering library at the University of Alabama and served as librarian at Redstone Scientific Information Center (Huntsville, Alabama), publishing articles and some 50 book reviews.

Interested readers are welcome to contact Mr. Kitchens at [plibri69@gmail.com](mailto:plibri69@gmail.com) for spaceflight questions in general, or request a copy of the author's 1994 article, "Liftoff to the Moon" as listed in the Selected Readings.

**Message from the author to his readers:**

By this story of the unprecedented, my objective was not only to enable our readers to advance their knowledge of spaceflight, but also to appreciate von Braun and Apollo and their places in history; how human exploration meshes with curiosity; the value of reading and a solid personal "learning model"; and the importance of "DREAMING BIG" and having a BURNING PASSION. One can follow in von Braun's footsteps by remembering Robert H. Goddard's words:

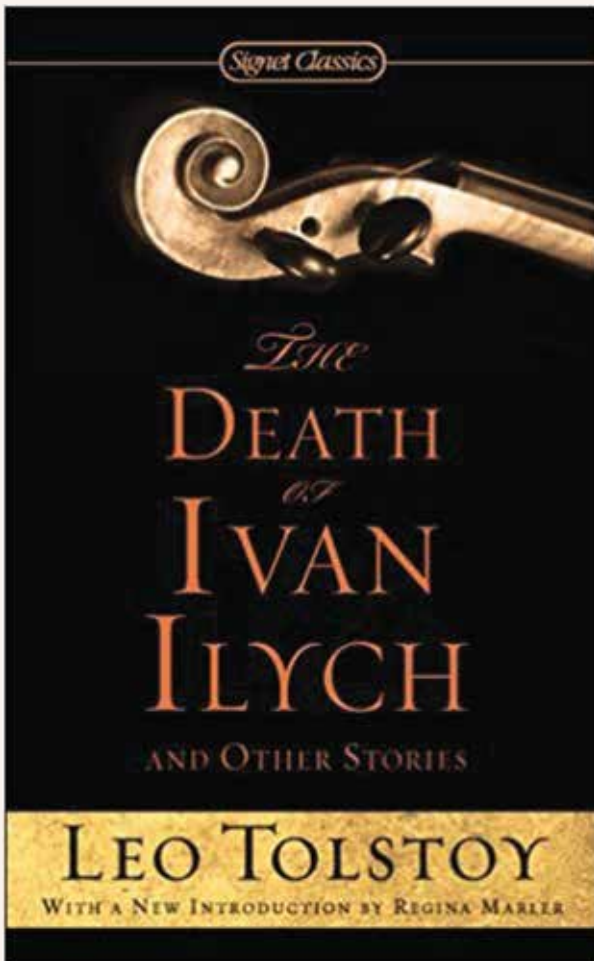
**"It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow."**





# BOOK REVIEW : THE DEATH OF IVAN ILYCH

by Serena



of the long character names that all seemed to end with “ovsky”, “ovna” or “vich”. (The Character List at the back that spans four pages did not make referencing any easier).

Now it sits on my desk collecting dust, and I’ve been rather put off from picking it back up ever since.

This summer though, while waiting for my lunch at Café330, I wandered into the university bookstore and a book titled “*The Death of Ivan Ilych and Other Stories, Leo Tolstoy*” caught my eye. A total of four Tolstoyian novels, under 300 pages for just

\$60HKD? That’s a bargain. I swiped one up and headed for the cashier.

Classics are what they are for a reason; they have earned their place as exemplary works of literature. Understandably, they get a lot of hype and you almost expect the book to engage you from page one. Let’s be realistic, and a little patient. *Ivan Ilych* started out rather dull, which was no crime. But...it *stayed* dull. 40% into the book, nothing spectacular or even mildly interesting has happened, just a mundane succession of life events: obtaining his law degree, Ivan works

his way up the social rank to magistrate, he gets married, bears children and plays bridge. With a salary raise, he purchases a larger house and arranges the furniture and curtains. He invites his colleagues to dinner. One gets the feeling either Tolstoy is overrated, or we’ve missed something.

The word that appears most frequently in the book is decorous. “Ivan amused himself pleasantly and *decorously*”, “as examining magistrate, he was just as *decorous* a man”, “life ran its course: easily, pleasantly, and *decorously*”. The word is defined as “keeping with good taste and propriety; conformity to accepted standards”. Indeed, everything Ivan did fit neatly with societal expectations. He lives comfortably, and he takes pleasure in “ambition and vanity”. Ivan is also emotionally detached, as he sets about the delicate business of compartmentalizing his work and family life. Nevertheless, he ploughs through life with a sort of mechanical placidness.

Leo Tolstoy (1828 - 1910) is a colossal figure in the literature world. His literary career spans six decades with genres ranging from novels to short stories to plays to philosophical works. A contemporary of his, Anton Chekhov describes that: “What he does serves to justify all the hopes and aspirations invested in literature”. Frankly, I was as much intimidated by the sheer bulk of his novels (Penguin Classic’s *War and Peace* is 1440 pages and *Anna Karenina* is generously, 500 pages shorter), as I was by his impressive beard. I confess I got through about a fifth of *Karenina* last summer before school started which left me neither time for the Russian aristocracy...nor the brainpower to keep track



Leo Tolstoy



*Ivan Ilych*

One day, Ivan falls from a ladder and hurts his left side. This incident was initially dismissed until a few weeks later he becomes aware of a numbing pain at the injury site which intensifies and worsens until he becomes bedridden. Several top physicians were unable to alleviate or cure him, making frustratingly vague diagnoses. Ivan becomes ill-tempered, agitated, depressed, and above all...more conscious. He sees through the loveless sympathy delivered by his wife, who inquires his health “only for the sake of asking, and not in order to learn about it”, the obligatory visits paid by his daughter who is “strong, healthy, in love, and impatient with illness, suffering and death because they interfered with her happiness”, and he sees even through the doctor who assumes a mask of cheerful expression each visit that was all “nonsense and pure deception”. Ivan asks the doctor whether he is ever ashamed of lying. He is disgusted with this falsity that surrounds him and craves for compassion and pity. As he wrestles with the unrelenting pain, it becomes apparent that he is dying; a fate he

never considered would befall on him. Ivan could not resolve himself to accept or even understand this. He refers to Death as “*It*”, and questions bitterly the meaning of pain and suffering. The answer he receives is disappointing in its absurdity: that there is no purpose for suffering, and there is nothing beyond or besides it.

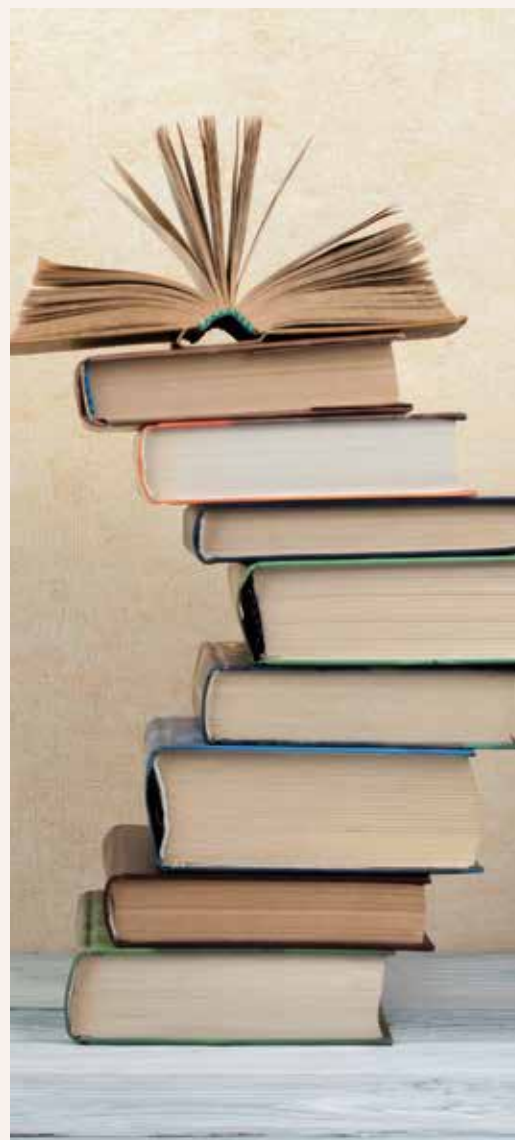
Slowly, and oblivious to those around him, Ivan reflects on his life and starts to grasp its hypocrisy. He realizes that despite his achievements, what he suppressed or neglected might in fact have “been the real thing, and all the rest false”. When he tries to justify himself he finds there is nothing to defend *for*, and he feels both agonized and liberated by this revelation.

There is no glamorous ending to this story, and Ivan dies shortly after.

It was unsettling for me, when I read that Tolstoy himself wrote: “because death exists, life itself is not worth living”. If a man of such prolific achievements as Tolstoy could reduce life, for all it really *is* worth living for,

to the mere morsels of mortality...where do the rest of us fit in? Why do we even bother at all? In fact, Ivan’s story utters a resounding truth. In our pursuit for whatever we deem “important”: well paid jobs, so-called high ranking social positions or what not, along the way, we are swept up in a whirlwind where recognition defines achievements. Yet in all our efforts to conduct life “decorously”, these are not the only units that measure life. Perhaps the real units lie in what Ivan “neglected and suppressed” - we ought to flesh these out.

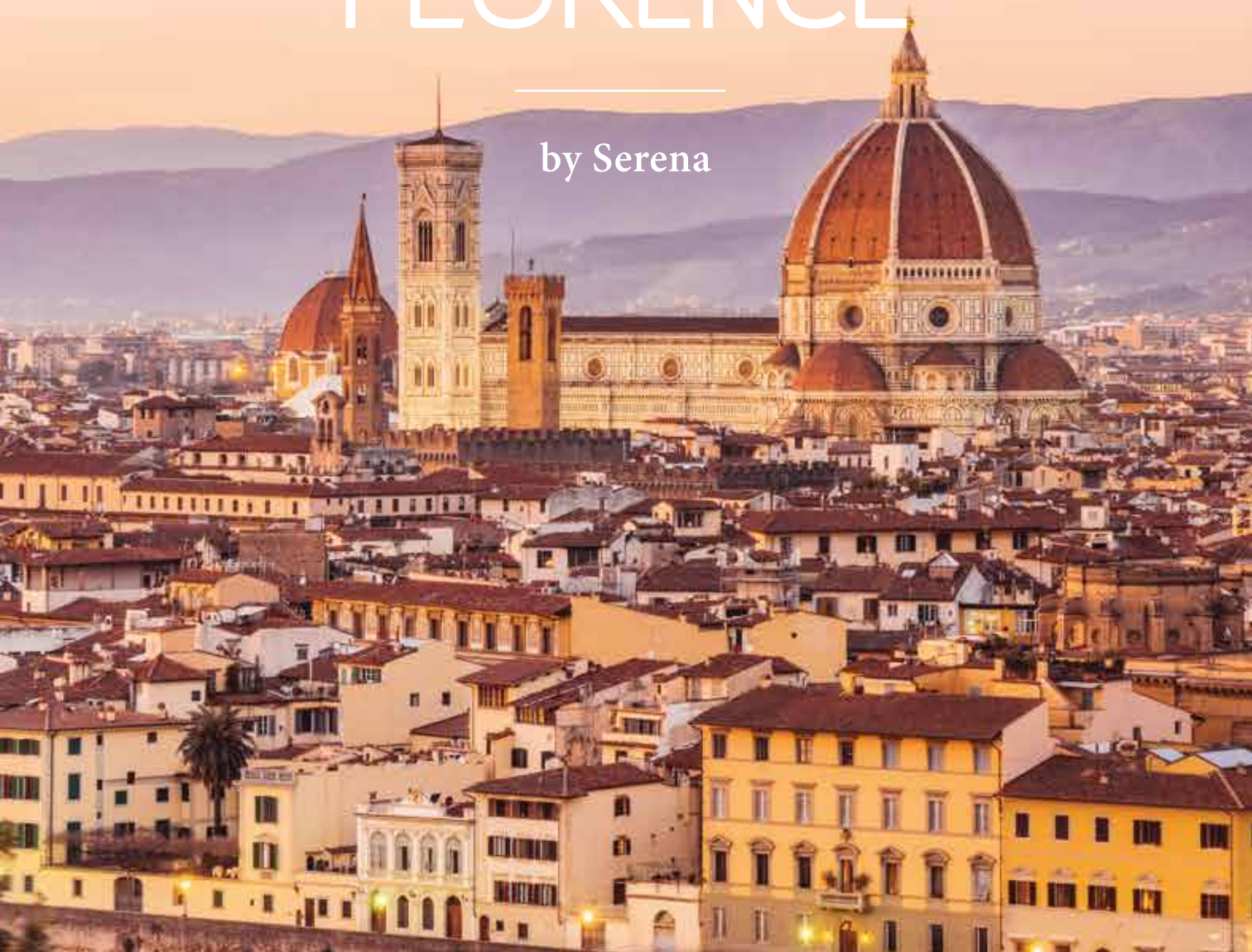
**Let's fight this a little,  
let's make life worth  
living precisely  
because death exists.**



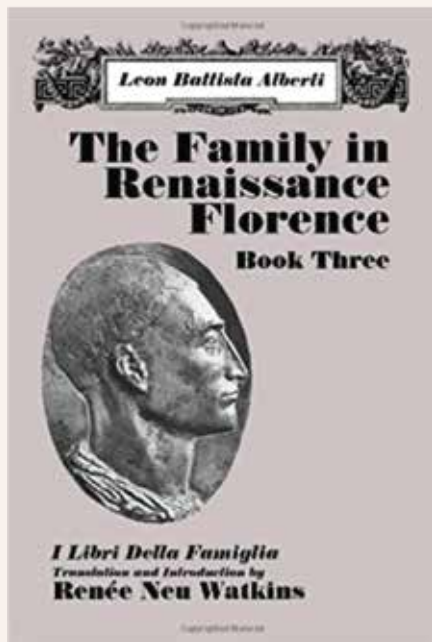
BOOK REVIEW :  
THE  
FAMILY  
IN  
*RENAISSANCE*  
FLORENCE

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by Serena



# “Read me, and take me to your hearts.”



Above is the opening line of Leon Battista Alberti's *I Libri Della Famiglia*, *The Family in Renaissance Florence*. Alberti was a 15th century Italian humanist, author, architect and courtier steeped deeply in the booming Renaissance in Florence, Italy; a period where ideals from antiquity were revived and Greco-Roman figures like Plato, Caesar and Cicero were studied with renewed vigour. It also ushered in a new outlook on life and etiquette, raising the bar for what it meant to be noble, dignified and cultured. Alberti claims a spot among them, considered a *Uomo Universale* (Universal Man), he was a multitalented gentleman who studied the classics, built chapels,

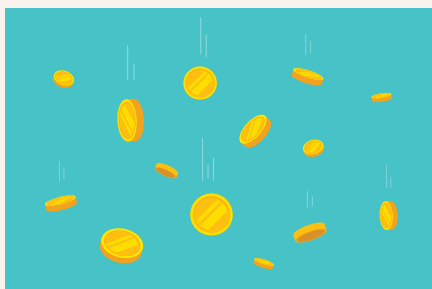
composed poetry, did geometry and wrote Latin books on architecture. Admired and respected, Alberti was the embodiment of “the perfect Renaissance man”.

*Della Famiglia* is the third book out of a four book volume that is the Renaissance equivalent of a Guide to Life handbook written by Alberti. It is written in dialogue, similar to Plato's Symposium with an exchange of ideas where Alberti communicates his vision, beliefs and philosophy through the voice of Giannozzo. Below are excerpts from his book, organised in respective topics, that I particularly savoured:



**On family:** *Families are to be gathered under a single roof, and if, when the family has grown, a single room no longer holds them, at least let them all repose in the shadow of a single will*

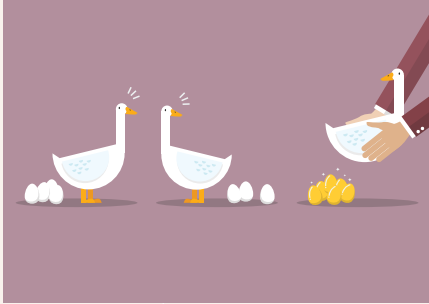
**On health:** *We ought to be extremely watchful in the management of so precious a commodity as health*



**On spending:** *It is most desirable my dear children to be thrifty. One should guard against too great spending as if it were a mortal foe; Spend enough, but not more than enough*

**On needs vs wants:** *When something is necessary, don't rush in madly but do with deliberate speed. Voluntary expenses, on the other hand, I handle quite differently: I'll tell you I go slow, I delay again and again, I go as slow as I can. To see if this particular desire will leave me along the way*

For the shoppers who have regretted one too many impulse purchases...



**On greed:** *For if a man finds he has less than he needs in his home, he will find still less outside*

Alberti was shrewd and observant, and regarded certain professions (which I shall leave you the liberty to venture a guess) with distaste.

**On occupation:** *You construct here, appeal there, bow before one man, quarrel with another, no true friendships, all full of pretence, vanity, and lies. What does your advantage consist of but this: that you can now steal and use violence with some degree of liberty. Let others enjoy pomp, and let the winds blow wide their sails while fortune wills*



He was also realistic. When asked his thoughts on where to raise children, he muses on his affection of the rural countryside, for it is freer of vice, yet he understands that without exposure to vice one cannot differentiate it from good.



**On child rearing:** *If my children could expect to spend their whole lives never to talk to any but good persons, I would certainly want to have them grow up in the country. But the number of men who are not of the very worst sort is so small that we fathers, to protect ourselves from the wicked and their many devices, must make sure that our children know them. A man cannot distinguish who is wicked if he knows nothing of wickedness. First, we must learn to wound so that then we may know how nimbly to avoid the pointed lance. It is in the city that one learns to be a citizen*

Some understandably out of date topics were amusing to read.

**On women:** *The character of men is stronger than that of women and can bear the attacks of enemies better, can stand strain longer, is more constant under stress. Therefore men have the freedom to travel with honour in foreign lands, acquiring and gathering the goods of fortune. Women, on the other hand, are almost all timid by nature, soft, slow, and therefore more useful when they sit still and watch over our things*



Alberti did not like belts.

**On fashion:** *I have given some thought to the matter, and I think people do not generally consider it as much as they should. To generous and easy spenders it may seem unimportant if you belt your robes; but in fact belting a robe is doubly wasteful. Without a belt your dress appears fuller and more dignified; in addition, the belt, of course, makes the cloth shiny and rubs off all the nap. Soon, while your robes may still be new, the waist will already be worn out. Beautiful clothes, therefore, should not be belted. We want to have beautiful clothes*



Bear in mind this was a time of flourishing young talents and breathtaking arts, but also take comfort in the fact that while Raphael was painting his School of Athens at 26, Masaccio his Holy Trinity at 26, and Michelangelo sculpting his Pietà at just 23...for all their glorious accomplishments, like us, they also struggled with time management, and they also procrastinated, as so aptly put by Alberti:

**On time management:** *The man who neglects things finds that his time escapes him, then necessity or at least desire brings him to action. Having, by then, almost let the season go by, he must act in a mad rush. With strenuous effort he accomplishes the same thing that earlier and at the proper time would have been easy*

This book was an assigned reading from a Renaissance and Reformation course I took. For all intents and purposes, I expected this to be an archaic text. Yet, I did not expect to take to heart, nor indulge in such a comfortable read on quiet nights. Who would have known that the words of a man who lived over 500 years ago still resonates with our modern selves? We all could heed some life advice from the seasoned Italian courtier...

Reflect on your values, defend your loyalties. I shall leave you with my favourite line, that is his advice on truth and choice:

**On integrity:** *Never do something about which you are doubtful. Because things that are true and good are luminous and clear in themselves.*

#### UGFH Box: Plato's Symposium

In Plato's Symposium, a group of men discuss their perception of love. Among them, Socrates offers the most reflective and wholesome account of the meaning of love. Similarly, Giannozzo plays the part of wise man and in this context: on the subject of leading a respected life in alignment with the Humanist ideals of the Renaissance.



Shannon LaBrie's song, *Calls Me Home* starts with this line:

♪ "It's funny how the walk of life can take you down without a fight..." ♪

If you feel worn out, you are not alone. Please know that there are people out there who can help you.

Below we provide some quick facts and dispel common misconceptions about seeking counselling on campus, in the hopes that this (completely free) service can be more accessible to you:

### ❓ **What is the Wellness and Counselling Centre (WACC)?**

It is run by a group of clinical psychologists, social workers and counselling experts who aim to assist students in overcoming the various challenges in life.

### ❓ **Where is the WACC?**

2/F Pommerenke Student Centre

### ❓ **How do I make an appointment?**

39437208/39433493, website: [www.cuhk.edu.hk/osa/wacc](http://www.cuhk.edu.hk/osa/wacc), email: [wacc@cuhk.edu.hk](mailto:wacc@cuhk.edu.hk)

### ❓ **Is there a 24-hour support hotline?**

54002055

### ❓ **What if this shows on my academic record?**

WACC is independent from both the UHS and academic branches of the university. Your record will remain confidential.

### ❓ **Appointment wait-time is so long...**

Average wait time is only 6 days!

### ❓ **If I have an emergency, can I do walk-in?**

Walk-sessions are available during the first 2 months of semester. Please come.

### ❓ **Can I get referred to a psychiatrist? How much does it cost?**

If the counsellor determines you may require professional psychiatric services, WACC can refer you to a private psychiatrist with full fee subsidization.

### ❓ **Can I book multiple sessions with WACC?**

You may. Each session typically lasts 45 minutes.

### ❓ **Seeking help is a sign of weakness.**

It is a sign of strength.

### ❓ **Others will not understand my difficulty.**

Try them.

### ❓ **I don't want to burden others with my problems...**

Hey, if the counsellors at WACC felt this way, they would not sign up for this job. Try them.

Below are some off-campus resources you may consider:

Suicide Prevention Services (24-hour): 2382 0000

The Samaritans (24-hour): 2896 0000





# CURIOUSITY