Intro

BACK TO NATURE AS A GOD LOVING ATHEIST

“It is essential to my happiness that I make every effort to bring it about that many others should have the same insights as I and that their knowledge and will coincide completely with my knowledge and will”

Spinoza

I must begin by giving my sincere apologies to each and everyone whom felt insulted or agressed by some of the ideas expressed in this e-book.
Religion and deity are delicate and very personal subjects.It cannot be further from my intention to hurt feelings in any way,as it was not for Spinoza.
He answered,when he was offered a chair at the university but not to disturb;”I do not know how to teach philosophy without becoming a disturber of established religion”So he refused the offer.
I decided to stay as honest as possible towards the ideas of Spinoza as far I understand them ,but have put them in perspective with todays recent discoveries concerning the functioning of the brain.
Explaining Spinoza’s extraordinarily revolutionary filosophy , for his time and as much,for ours, is a risky endeavour.
Only after reading books and hearing several expositions of Spinoza’s ideas it appeared to me that sometimes we do him horribly wrong .We certainly did for centuries in the past and even today sometimes ridicule his philosophy.He was considered an atheist in his days ,whereas an honest reading of the ethics reveals a profoundly religious man in his way of thinking as in his way of life.It is said that he was « ivre de dieu « ,drunken of god and also to be an atheist.Proof that he was certainly at times,misinterpreted and or misunderstood.
His idea that god and nature are the same , is not always adequately grasped ,as is the body mind relation,nor its profound
and far reaching consequences.
Even though Spinozas life and the time in which he lived are extremely interesting ,we will only mention some historical facts when called for.We will not dwell on his socio political ideas, very avant-garde for his days,and now endangered by the growing economic influence of totalitarian regimes.
Once we truly understand his philosophy,his socio political ideas logically follow from it.
His philosophy springs out of the enlightenment in Europe but is so astonishingly timeless ,universal and progressive even for the 21 st.
century.They say time is the best killer. Indeed today, as in the past, many scholars ,scientists and artists are still taken aback by Spinoza’s philosophy .It is still enlightening for most of us today.
Scientific discoveries ,in the last decades,concerning the functioning and structure of the brain,confirm Spinoza’s most challenging theories on emotions, free will ,the body and mind controversy.

Philosophers do not study the brain,very few know what LTP is in the brain.
In the same way neuroscientists probably very few have knowledge of the mind-body problem in philosophy.
Still less neuroscientists dare talk of the philosophical implications of their findings.
Kevin J.Mitchell being a rare exception.
We need brain philosophers.
Crossbreeding between both professions is rare.
Science and philosophy are too far apart.
I have tried to fill the gap even though I studied economics…
Many scientists ,poets philosophers and artists find and found through his concepts ,inspiration, peace of mind and confirmation of some their own intuitions.
Einstein stated that he believed in the pantheistic god of Spinoza.He did not believe in a personal god who concerns himself with fates and actions of human beings,a view which he described as naive.
For Damasio Antonio , a popular American neuroscientist,Spinoza is the precursor of modern neurobiology.I fully agree with him.
Many poets and writers admired and studied his Ethics; Goethe ,Flaubert,Eliot,Wordsworth.
To Coleridge and Shelley,he communicated a mystical sense of the perfect unity of Nature.
Freud recognized his profound affinity with Spinoza.
Henri Bergson wrote that when you are a philosopher ,you have two philosophies,yours and Spinoza's.
Nietzsche and Spinoza are called enemy brothers.
Nietzsche said of him;"I am utterly amazed, utterly enchanted! I have a precursor, and what a precursor!"
Hegel declared that" to be a philosopher one must first be a spinozist"
Bertrand Russell in one of his letters wrote; "Spinoza has been one of the most important people in my life...the noblest and most lovable of the great philosophers".
Leibniz, who owed much to Spinoza, concealed his debt to him,and carefully abstained from saying a word in his praise; he even went so far as to lie about the extent of his personal acquaintance with » the heretic Jew ».
Frank Sewall,in his introduction to the Ethics writes that Voltaire, that champion of reason and Enlightenment thinking, (also an ardent racist, who thought that black people were a different species and who does not suffer from excessive humility)
said about Spinoza ;
"Vous êtes très confus Baruch Spinoza,mais êtes vous aussi dangereux qu 'on le dit?Je souhaite que non:et ma raison c'est que vous êtes confus,que vous avez écrit en mauvais latin,et qu'il n'y a pas dix personnes en Europe qui vous lisent d'un bout à l'autre quoique on vous ait traduit en français «
Spinoza is one of the most astonishing and controversial philosophers of modern times, profoundly influenced by the Ancient Greek thinkers and Maimonides.
He has an assured place in the intellectual history of the Western world ,because his philosophical system is completely severed from any specific religious or historical perspective. He was strongly opposed to any form of supernaturalism, and almost universally misunderstood (and denounced) as an atheist for nearly a century after his death and sometimes still today.

The method he used ,Euclidean,to expose his philosophy,must have discombobulated more than one,like it did Voltaire.
It is important to assimilate the basic idea of Spinozas God clearly ,exactly,from the beginning in the first chapters.For his metaphysics are the basis of his ethics that logically follow from it.
His revolutionary vision on the mind body controversy laid the groundwork of his entire logically constructed system.
If we are to understand Spinoza's manner of living and his judgement in ethical,scientific,political and theological questions,we must consider the fundamental view that precedes everything else.
It is to be sought in the metaphysical vision which dominated his life from the beginning to the end.
Once we grasp this ,all the inevitable ,unavoidable,consequences follow logically and astonishingly clearly in the following chapters.
As he said, »an adequate idea can only be judged adequate when confronted to a whole system of adequate ideas. »
We will talk a lot about the human brain ,because knowing the brain,understanding the brain's functioning,will at the same time help understand ,confirm and enlighten Spinoza's ideas and philosophy even though he himself knew quasi nothing about the brain's functioning, compared to the astonishing revelations made by the brain sciences in the last decade,even the last years.
These discoveries confirmed the correctness of Spinoza's attitude in the mind-body controversy,and solidified the base of his philosophical construction.
I must apologize a second time but now for my fat-free sentences.
We nevertheless hope the lecture will bring you joy, a better understanding of this wonderfully miraculous philosopher and many precious life lessons as it did for me.

Picture the fly em data

connectomes. These are three-dimensional maps of all the neurons in entire brains, and how those neurons link together

supercharged by modern microscopy, heavy-duty robotics and a dollop of machine learning,artificial intelligence scientists have been able to reconstruct
a Picture of the olfactory pathway of the fruit fly hemibrain ,millions of these twodimensional hair thick slices created three dimensional models
from the economist 23jaanuari

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Chapitre 1

And hark! how blithe the throstle sings!
He, too, is no mean preacher:
Come forth into the light of things,
Let Nature be your teacher

William Wordsworth

Muslims,Jews,Christians and many religious people,see God as the Creator standing above his creation looking down on it and intervening as necessary.Rewarding the good and punishing the bad so as to improve it,since it was not perfect from the beginning...

Spinoza's definition of God cannot ,in any way,be integrated into any of these visions.

As a young boy he was instructed in the mysteries of the Talmud,the Cabala and the Old Testament.
For a living ,he studied lens polishing.
Lenses were a novelty at the time and very much in demand. The rubbing of a piece of glass for hours to obtain the perfect shape must be a meditating experience.On top ,the result permits you to see the world differently,clearly,wether the lenses are for eye glasses,telescopes or microscopes.Spinoza was even better known in the beginning for the quality of his lenses rather than for the quality of his philosophy…
Grinding and polishing lenses in his day was a quiet, intense, and solitary occupation, demanding discipline and patience—in a word, an occupation perfectly suited to his temperament as a philosopher.Unfortunately, it was not well suited to his frail physical constitution .He suffered from tuberculosis .The glass dust produced by the grinding probably exacerbated the respiratory problems he had suffered since childhood and contributed to his early death, in 1677, at age 44.
His teachers were deceived when he no longer wanted to continue his Jewish studies at a younger age.They even went to offer him 1000 florins a year if he decided to stay with them,stopped his critical comments and "bad "influence on the other students at the synagogue.
He was after all destined to be a brilliant rabbay,being the favorite student .
After his refusal, and an attack on his life, when he came out of the synagogue,the Jewish community finally banned him at the age of 23 in a solemn separation ceremony in the synagogue of Amsterdam,the largest of the country.What is called a"herem" is extremely brutal and harsh.Henceforth nobody is allowed to communicate with him verbally or in writing ,come close to him or render him service,live under the same roof or read his writings. People subjected to such a treatment sometimes kill themselves.Spinoza did not,on the contrary ,it inflamed his literary crusade.As of today this excommunication,still is not lifted by the Jewish community,even though it has been discussed as recently as 2016.So Jewish people are not supposed to read his books today...
Consequently Baruch is obliged to leave his home and family.Travels from Amsterdam to Rhijnsburg and changes his Jewish name for Benedict ,a christian one,also meaning blessed,but does not take up any other religion,and starts teaching Latin.

He had studied the Old Testament and critiques it as much as the Talmud and the New Testament.
Contact with secular and critical Christian ways of thinking increased Spinoza's original dissatisfaction with the biblical interpretations he had received from the rabbis,who had frowned on his interest in natural science,and on his study of the pernicious Latin language of the intelligentsia,in which so much “heresy and blasphemy “had been so engagingly expressed.
His growing independence of mind led him to sympathize now with the unorthodox Christians of the Netherlands,the Collegiants and the Mennonites,with their simple lifestyle and tolerant practice.A moral archetype that he was to defend in his writings later on.
In his Theologico-Political Treatise ,the 20 first chapters clearly explain his vision on and the problems he has with; the prophets,prophecy,divine,miracles,scripture,reason,theology ,the Old Testament, divine law ,the scriptures and more.Traitise,as quickly forbidden by the public religious authorities,Catholic,Jewish and Calvinistic alike, but of course ,widely read and commented by the intelligentsia all over Europe.
Clearly these different visions of God and religion did not satisfy Spinoza as a young scholar.When someone,wishing to convert him to the Catholic faith,accused him of regarding only his philosophy as the best,he replied”I do not claim to have found the best philosophy,but I do know that I recognize the true philosophy “
He was sometimes called a God loving atheist as he deeply criticized the pretentions of scripture and sectarian religions.His major work,the Ethics,was called the bible of an heretic.As ,let us hope, will become obvious later on,this has been for hundreds of years an incorrect appreciation .He truly was a God loving person.
Mingling now more with the catholic and free thinking intelligentsia in Holland ,which in those days was one of the freest countries of Europe,his concepts are not altered but polished, as his lenses,uncovering a miraculously new vision of the world,God and mankind.Extraordinarily revolutionary for his days and ,i am convinced ,still for most of us today.
He settled in the headquarters of the Collegiants in Rijnsburg and his reputation as a learned man spread.He began to receive visits and correspondence from enquiring people anxious to discuss with him the scientific and philosophical questions that were sterring the minds and the hearts of Europeans.
Spinoza’s mother-tongue was Spanish,but he was a master of Hebrew and had an effective command of Portuguese, Dutch and French.However ,none of these languages contained the wealth of scientific and philosophical argument that was contained in Latin.The Ethics thus,he wrote in Latin,the language that became his primary vehicle of his thought and the symbol of his intellectual quest.
In choosing this universal language,he wrote the last indisputable Latin masterpiece in which the refined conceptions of medieval philosophy are finally turned against themselves and entirely destroyed.Unfortunately,having chosen to write in a language that was so widely and internationally intelligible,he nevertheless was compelled to hide all his lifetime what he had written.It was only after his death that his loyal friends,gathered together the philosophers correspondence,together with the Ethics to print.Even these editors did not dare to add their names to the publication,which was as quickly sold out as it was banned.

The style of this work is parse,unadorned and written following the eucledian method to convince the reader as scientifically as Spinoza thought was possible in philosophical matters.Unfortunately this style makes the Ethics hard reading,in the past as much as today.
Let us try to explain it and confront it with the most recent findings of the neurosciences.

Chapitre 2

The world is too much with us; late and soon, getting and spending, we lay waste our powers
Little we see in Nature that is ours forth into the light of things, let Nature be your teacher.

William Wordsworth

So,Spinoza does not at all agree with the different visions of deity of his time,but by what does he replace them?On the one hand he was extremely acerbic in his analysis of the Jewish, Christian,Muslim world visions,but on the other hand he constructed a majestic , innovative and completely new and positive worldview.
He defines his deity in the first chapter of the Ethics .
Concerning God,we go,from definitions,to axioms ,propositions and proof.As we said,hard reading,written in the geometrical ,argumentative method , with its frequent cross-references between its axioms, definitions, propositions and demonstrations.It reflects a basic principle of Spinoza's thought that everything in the universe is connected and interacts through universal eternal Natural laws.As we said,hard reading.
Fortunately in the appendix of this chapter,Spinoza resumes his ideas on deity,which must for the moment suffice for our understanding;
“I have explained the nature and properties of God.I have shown that he necessarily exists,that he is one:that he is and act solely by the necessity of his own nature;that he is the free cause of all things,and how he is so;that all things are in God,and so depend on him,that without him they could neither exist nor be conceived;lastly,that all things are predetermined by God,not through his free will or absolute fiat,but from the very nature of God or infinite power.”
This is a very condensed definition in which every word counts,but as we go along much of this will become more explicit and clear .
”By God ,I mean a being absolutely infinite,that is ,a substance consisting in infinite attributes,of which each expresses eternal and infinite essentiality.All is in God and God is in all,nothing can exist outside of him,so do not look for a god outside ,or above Nature. »
This definition made Spinoza to be considered both as an atheist and as a pantheist.
Both interpretations would have been repudiated by him,as displaying a limited understanding of his ideas.
The universe is the body of God who exists in the world and not beyond it.Why look elsewhere when God has always been right in front of our eyes?
The universe,space and time and their contents,stars,galaxies and planets like our own.

All forms of energy and matter,the quarks,neutrons and electrons,dark matter and dark energy.
The observable diameter of the universe ,at the least 93 billion light years,containing hundreds of billions galaxies like our Milky Way, originating,as far as we know,in the Big Bang around 13,8 billion years ago and expanding at an increasing rate.
Today we understand about 5% of this observable universe on which the general theory is applicable,on the other 95%,dark matter and dark energy, we unfortunately don't have a clue yet how it works.Evolving black holes, black hole 's behaviour of space-time, the nature of inertia, the energy of the gravitational field, quantum effects in the near horizon region, turbulent space-time during black hole mergers, the classical characterisation of the gravitational field, regular black hole interiors are all physical topics that could have philosophical significance.
The first spectacular image of the new space telescope ,JWST,released was of the galaxy cluster SMACS 0723, known as Webb's First Deep Field. This image covers just a patch of sky approximately the size of a grain of sand held at arm's length by someone on the ground – and yet it is crowded with galaxies, literally thousands of them. Within each galaxy, there could be on average 100 billion stars, each with its own family of planets and moons orbiting them.
The exploration of such limits can pave the way to new discoveries about the universe ,our ways of representing it and relativize our place in it.
All this,Nature,Spinoza did not even imagine in his days.
The plant and animal kingdom ,rocks and rivers are understandably part of Nature.
What is sometimes more controversial ,is that we humans,homo sapiens,are an integral part of Nature That we are not an empire in an empire,or as Baruch wrote ,"a kingdom in a kingdom."
The COVID-19 experience should make it clear that we are not above Nature but part of it.That Nature is not there for us as we way too often presume.
This has important consequences as we will see further on.
In nature Spinoza also includes the laws of Nature;
"Everything in Nature proceeds from a sort of necessity,and with the utmost perfection"he saw and what Einstein studied.
The laws of Nature are also God,the Natural laws.The study of these natural laws was for Einstein the foundation of his religious beliefs.
The laws of Nature ,Spinoza calls, the divine laws cannot be transgressed.Therefore he always opposed miracles.
Our brain,as integral part of Nature ,also is God as are our ideas and behaviour that are defined by it.When our brain works,God or Nature,works.
The functioning of the brain ,neurons,synapses and neurotransmitters,even though not known in his days,are thus equally submitted to these laws of Nature, what Spinoza called ,the body of the mind.Some scientists state that Spinoza was the first neurobiologist,as he conceived that the mind is subjected to the same laws as the body and the rest of Nature.We will elaborate on that more later.

Man is an integral part of nature even though he often thinks of himself as the center of it ,that he is above it,or that Nature is there only for him ,all are foolish misconceptions.As much as the misconception that the earth is flat.
Suzanne Simard rightly said we have separated ourselves from Nature.
Man is not the purpose of Nature,God loves men as much as he loves all the rest of nature,not more nor less.God loves Nature as much as he loves himself,since both are identical.
Since we ,men,are an integral part of Nature,we also are part of God.
Hindous ‘,Namaste,means i greet the God in you,reflecting the belief that the divine and self (atman, soul) is the same in you and me.
But let us not make a mistake.The idea of some,to reduce Spinoza’s vision to pure materialism , is completely wrong as will become obvious in the following chapter.We cannot consider Spinoza an atheist only because he criticized many religions.He stayed profoundly ,some would even say obsessively,religious .
Why can’t we say he is a pantheist?
It is Spinoza’s concept of Substance, which he equals to God,the divinity of Nature,the subject of our next chapter,that differentiates him from materialistic pantheistic philosophers.
God did not create the universe,nor does he sit above it.He IS the universe.Spinoza is thus dispensing with the first dualism of Descartes,and the many religious visions,that see Nature as God’s creation and as two completely separate identities.
God does not intervene in Nature,otherwise he would be intervening into himself.
God does not manage the world,this consequently means that creating a better world falls back on our shoulders?

Nature evolves only through the Natural laws,part of Nature and thus God.Since God is Nature,both are perfect ,immortal ,infinite and self caused. »All that exists is perfect ,the only imperfection is not existing”Spinoza wrote.
God does not judge the world nor man ,otherwise he would be judging himself.Neither does he asks things from Nature or man,otherwise he would be asking things from himself.Also,man,has nothing to ask from Nature or God.
Since God is perfect,the universe,nature,man,all are perfect,since they are identical.
Bruno Giardano, we must render unto Caesar what belongs to Caesar, much influenced Spinoza and was among the best known persecuted pantheïsts or pandeists.He had been burned at the stake in Rome’s Campo de Fiori,where he still stands...On the 400th birthday of his death in 2000,cardinal Angelo Sedano,declared Bruno’s death a sad episode ,but justified the Inquisitors decision since they”had the desire to serve freedom and promote the common good and did everything possible to save his life”
He was to be put to death but without spoiling blood,thus on the stake.Spinoza admired him and some of his ideas.Bruno Giardano is still considered a landmark in the history of free thought and the emerging sciences.He insisted that stars were distant suns with their own planets which might foster life of their own…
Arthur C. Clarke, a science-fiction author, is reputed to have said: “Two

possibilities exist. Either we are alone in the cosmos or we are not. Both are equally terrifying.”
If life was unequivocally found somewhere in the universe,it would upend and correct humanity’s understanding of its place in the universe.
Which is urgently needed.Since many of us think we are privileged,that everything around us,the earth,the universe is arranged as it were for our benefit,that we can dispose of it as we see fit.
Bruno said that the universe was infinite without a center.Ideas that certainly pleased Spinoza but caused Bruno’s untimely ending.
Therefore Spinoza’s leitmotif was ,caute.He was indeed cautious,for he wished to live in peace.He was very careful to whom he communicated his ideas and gave his manuscripts to read.He postponed publications.He had no desire to be a martyr,the way Bruno was.The Ethics were only published after his death as he wished it so.
« I believe that each man should live as he sees fit and let those who will, die for their happiness,if only I,may be permitted to live for the truth »
It is difficult for most of us ,to adjust our religious upbringing and to eliminate this duality God versus Nature but one really feels different ,enlightened ,when you admit God in everything you see,touch,hear,do or taste ,in all of your senses,thoughts and ideas,in everyone you meet,rather than thinking God up above looking down,punishing and rewarding.
We are not the center of the universe,Nature is not there for us,Nature does not have a purpose,certainly not us.Nature does not have an ending or beginning.If mankind would be eradicated,another brainy organism would naturally evolve,the way we did,and think he can spoil it without consequences…
Nature is not different from us,is in us,we are part of Nature.Therefore ,the corona crisis should be seen as the first comprehensive crisis of the age of the Anthropocene – an era defined by the blowback from our unbalanced relationship to Nature.

Thinking like Spinoza,makes for a different identity and relation with Nature.

Chapitre 3

Wisdom and Spirit of the universe!
Thou Soul that art the eternity of thought!
That giv'st to forms and images a breath
And everlasting motion!

William Wordsworth

Let us now understand how Spinoza should not be seen as merely pantheistic .It is his not very well understood concept of Substance that differentiates him from materialistic pantheism.

Natura naturans ,is another well known expression of Spinoza.Nature naturing.The dynamics.
God or Nature is not only self-created as we saw,self caused.It is also self-creating.We could see Nature as an individual,the parts of which change in infinite ways,but still staying an individual.
We mustn't see Nature not only in its passive form(Natura Naturata)as we saw in the previous chapter.That is only the ears of the hippopotamus (the tip of the iceberg).What is more important to understand Spinoza's Nature is the active form.(Natura Naturans)Nature must not be seen solely as a mass of mass.As our friend stresses ;
"It is however a complete mistake on the part of those who say that my purpose...is to show that God and Nature,under which last term they understand a certain mass of corporeal matter ,are one and the same.I had no such intention"
What we could call ,the dynamics or the evolution of Nature is an integral important part .There is no Nature without naturing and vice versa.This active,dynamic part is expressed and solely ,completely determined by the eternal,universal laws of nature only,as we saw,also God,the Devine natural laws.
This dynamism is expressed in two different ways.

Firstly in the effort to preserve one's self,which Spinoza called the conatus ,Bergson called it élan vital,Nietzsche the will to power and before Spinoza ,Schopenhauer ,the will to live.The difference is that Spinoza sees this in the universe as a whole;
"Everything,in so far as it is in itself,endeavours to persist in its own being;and the endeavour wherewith a thing seeks to persist in its own being is nothing else than the actual essence of that thing ."
This self preservation expresses itself clearly in men
in the body's Homeostasis .
The emotions also,as we will see further,are part of the mechanisms of self preservation,the will to survival, the conatus as Spinoza calls this urge.
J.LeDoux,a fantastic present day neuroscientist,who I think read Spinoza said

that “...self preservation is a universal motive,independent of whether an organism is aware that it is working toward this goal.”
In the animal kingdom we can observe this self preservation.An animal will do its utmost to stay alive.Even in the plant kingdom this will to survive is everywhere.As man is not a kingdom in a kingdom,but an organism,his whole body , brain and even its emotions,work to this goal as we will explain better further on.
Even suicide and controlled suicide euthanasie,often cited as contrary to this thinking
,should in my view ,be seen as selfpreservation.
When there is only suffering and pain,an inevitable descent into the disintegration of the mind , the body and the self,we want our “selves”,to be preserved from desecration .

Secondly,Spinoza's conatus is read not merely as a striving, a desire to persevere and maintain life, mere self-interest and survival, but rather, more importantly, as the struggle to increase and expand its power,the will to power,capacities for learning, the enjoyment of life, friendship, and community. On this view, conatus is much more akin to the modern notion of empowerment. Conatus has a telos not just of survival but of enhancement, expansion, the fulfillment of life,increasing consciousness,mind.
“We strive to further the occurrence of whatever we imagine will lead to Joy,and to avert or destroy what we imagine is contrary to it,or will lead to Sadness. »
Neuroscientists have discovered that Dopamine is part of your reward system. This system is designed, from an evolutionary standpoint, to reward you when you’re doing the things you need to do to survive — eat, drink, compete to survive and reproduce. As humans, our brains are hard-wired to seek out behaviors that release dopamine in our reward system. When you’re doing something pleasurable, your brain releases a large amount of dopamine. You feel good and you seek more of that feeling,also called motivational salience.
The conatus at work in the brain.

On top of preserving oneself ,the species,every thing in Nature wants to improve,grow in complexity and power.This Nature Naturing is as much at work in the birds,the bees and “stupid” matter,as it is at work in us ,humans.And as we will
document further also in the brain.
Spinoza was a Darwinist avant la lettre,hundreds of years before Darwin.He said men is not created but merely engendered.
Precisely this evolutionary urge created Homo sapiens out of primates,our brains out of stardust.
Rarely do we admit intelligence ,mind,in everything around us in “stupid” matter.
Koch says“we are surrounded and immersed” in consciousness,as the chief scientist and president of the Allen Institute for Brain believes that “consciousness is a fundamental, elementary property of living matter. It can’t be derived from anything else.”

Spinoza goes further than Bloch.ALL matter ,not just living matter,evolves and has intelligence.In biology it is common to distinguish between living and “dead”matter by the ability to synthesize proteins and replicate autonomously. But the transition from the living to the non-living world should rather be seen as a continuation ,not separated by a sharp borderline,according to recent scientific studies .

When Spinoza uses the word Substance,to define this evolutionary urge,he gives it a different meaning from the Greek philosophers or Descartes.Still less the meaning we give it in today’s language.Substance,which Spinoza equals to God,is in all of Nature.We could call it the wondrous or mysterious part .Substance is what goes beyond the laws of nature,it explains not how,but why dead matter became a brain,conscious of itself and studying itself.

Scientists study the how of the evolution,the laws of Nature.Substance is the why of evolution,why Nature goes from a lower to a higher degree of consciousness,complexity.Substance explains why there is evolution in the first place,this innate desire to more evolved structures,but always following the laws of Nature.There are no miracles in this evolution,only the laws of Nature and Substance.

How does the sunflower tracks the sun and turns to the east in the morning light? Scientist will explain how specialized cells called pulvinus contain motor cells that create turgor pressure ,which enlarges or shrinks the pulvinus cells and triggers movement of the stem and in so doing attire insects to the warmth of the flower and fecund it. This began more than 100m years ago, when nature devised a more efficient way than winds for plants to procreate. About 80% of plant species now use animals or insects to carry pollen grains from the male part of the plant to the female part. The plants developed flowers. Their perfumed scent, colourful displays and sweet nectar are all designed to woo pollinators and assist in procreation,and at the same time color our lives.

The constant battle between pathogens and their hosts has long been recognized as a key driver of evolution, but until now scientists have not had the tools to look at these patterns globally across species and genomes. In a new study, researchers apply big-data analysis to reveal the full extent of viruses' impact on the evolution of humans and other mammals.Their findings suggest an astonishing 30 percent of all protein adaptations since humans' divergence with non human primates have been driven by viruses.The mutating viruses introduce new genetic materials into cells,some survive,others don’t.The so dreadful virus is a motor of evolution,natural selection and another element in this Natural march to more complex organisms.Viruses are unimaginably varied and ubiquitous.It is becoming clear just how much they have shaped the evolution of all organisms since the very beginnings of life. In this, they demonstrated us the blind, pitiless power of natural selection at its most dramatic.

Sometimes a word ,like Substance,takes on a new richness of meaning that had never before been associated with it,like the idea in Plato,reason in Kant,existence in Kierkegaard.So does Substance in Spinoza.

It is neither matter,nor the underlying,nor the enduring,not the laws of Nature,but a new and original word for the philosophical idea of God.

The wonderfully,unearthly,Godlike,rationality ,creative force and strength to persist and evolve in Nature ,expressed in its evolution and in its eternal laws.Mind scattered all over the universe.
As we will often observe,there is a certain parallelism with Hindu Vedanta philosophy.Atman ,the Sanskrit word for inner self,spirit ,soul or essence which underlies existence,the self as being identified with God.
The six orthodox schools of Hinduism believe that there is self ,divine in every being.All existence is a single reality,the oneness unifies all beings.There is one self within each entity ,fully identical with Brahman. There is no separate God soul,no dualism.
These concepts could have been written down by Spinoza.Often I suspect that Spinoza,through the business of his father who commerced in spices from the Indies in Amsterdam,had come in contact with this worldview,since we so often find striking parallels of this view with his own philosophical views.
Max Müller even said that"The Brahman as conceived in the Upanishads and defined by Sankara is clearly the same as Spinozas substantia"

Evolution ,the result of both the laws of Nature and Substance for Spinoza,is what,as far as we know it?

One trillionth of a trillionth of a trillionth of a second after the Big Bang (self caused?),the beginning of history as we know it,the strong,weak and magnetic forces of the universe were united to a single great force.If particles existed at all,they would have been different than to what we understand them today.
As the exponential temperature drops and the universe decelerates,the fundamental forces and bosons begin to emerge.There is still no mass.
As the temperature further drops,the higg fields emerge,particles appear that have mass.
Temperature and energy is still too high for particles to interact but form a cosmic soup,the Gleon plasma,but it has all the ingredients to form the universe as we know it.
It takes nearly 300000 years for the universe to form in a shape that we can recognize today.
Quarks form into hydrons.Protons come together to form nuclei,electrons bind to those to form the first atoms.
The heavy elements were created through nuclear fusion in the stars,combining nuclei to make a larger one.This nucleosynthesis depends on the lifecycle of the star and its size.Small stars convert hydrogen into helium,bigger ones convert helium onto oxygen and carbon,massive stars convert these into neon,sodium,magnesium,sulfur and silicon.
After that, reactions transformed the latter into calcium,iron,nickel,chromium,copper etc.The supernovas then created out of these ,the natural elements heavier than iron.These evolved elements are spewed into the universe when the stars age and end up in supernovas.Each of us is made from atoms that were produced in stardust that went through a

supernova.These building blocs were the basis of the primordial soup.
In recent years the debate has focused on which of two key events came first to create life out of"dead "matter;metabolism or replication.Let us be honest we do not have a clue.Neither side is clear how it all started.We do know that life began roughly 3.8 billion years ago with the first prokaryotes.It took evolution about 10 billion years to create life on our planet,talking only of our planet.Maybe we should see life appearing not as an evolutionary miraculous jump in time,but rather as a continuation.That there has always been life ,intelligence in "dead" matter,from the early beginnings at the Big Bang.Intelligence,a mind in matter,a creative force.
DNA, or deoxyribonucleic acid,the hereditary material in all living organisms then carried genetic instructions forward for the development,functioning,growth and reproduction of all known living organisms and viruses.This biological information has a 4 billion year history of life encoded in its double helix,itself evolved from the RNA.The building blocs of this DNA were formed in outer space.
Well-understood molecular mechanisms reshuffle, duplicate, and alter genes in a way that produces genetic variation. This random variation is the raw material for evolution of life.
But what about "dead"matter?
It's evolution as we saw, from nothing to something,from simple to complex molecules and elements,is it random?
Pyrimidine ,the most carbon rich chemical found in the universe,may have been formed in interstellar cosmic dust and gas clouds.This pyrimidine in laboratory has been transformed ,reproduced into all the organic components of life;uracil,cytosine,thymine,mimicking those transformed and found in space.
Nature is capable of storing 215 petabytes (215 million gigabytes) of data in a single gram of DNA.
A feature even the newest chips can only dream of.

Evolution created specialized cells,neurons,to rapidly and economically relay information from the sensory cells to the motor cells.These neurons,over time created the human brain that has grown fourfold in size in only the last 3 million years.
Neuropsychologist Nicolas Humphrey as a convinced Darwinist,says that the mind,it's physical organ,the brain,has evolved because of the positive effect it has on the behaviour and survival of the organism that it possesses.A better brain increases the chances of survival,the reproduction of its DNA.
Better brains,better chances of survival.
The primate became Homo sapiens,conquered the world and now thinks he is above nature and can destroy it since it was created for him…
Recent theories suggest it was the moment homo erectus started to use instruments to eat the inside of the bones ,that our brains had all the ingredients to grow quickly .Jessica C. Thompson has this assumption;"that the regular exploitation of large-animal resources—the "human predatory pattern"—began with an emphasis on percussion-based scavenging of inside-bone nutrients, independent of the emergence of flaked stone tool use. This leads to a series of

empirical test implications that differ from previous “meat-eating” origins The habitual consumption of large-animal resources (e.g., similar sized or larger than the consumer) separates human and nonhuman primate behavior. Flaked stone tool use, another important hominin behavior, is often portrayed as being functionally related to this by the necessity of a sharp edge for cutting animal tissue. However, most research on both issues emphasizes sites that postdate ca. 2.0 million years ago. (Her)paper critically examines the theoretical significance of the earlier origins of these two behaviors, their proposed interrelationship, and the nature of the empirical record. We argue ,she says,that concepts of meat-eating and tool use are too loosely defined: outside-bone nutrients (e.g., meat) and inside-bone nutrients (e.g., marrow and brains) have different macronutrient characteristics (protein vs. fat), mechanical requirements for access (cutting vs. percussion), search, handling and competitive costs, encounter rates, and net returns. Thus, they would have demanded distinct technological and behavioral solutions.”
Anyway,I think we have the problem here of what came first,the chicken or the egg.By using instruments he could access the bone marrow or brains which allowed access to all nutrients necessary for nerve cell growth and thus better brains and survival chances.
Let us not forget that one tablespoon (14 grams) of raw caribou bone marrow provides;

Calories: 110
Total fat: 12 grams
Protein: 1 gram
Vitamin B12: 7% of the Reference Daily Intake (RDI)
Riboflavin: 6% of the RDI
Iron: 4% of the RDI
Vitamin E: 2% of the RDI,
Phosphorus: 1% of the RDI
Thiamine: 1% of the RDI
Vitamin A: 1

Bone marrow is fat,but the fattiest organ of your body is the brain.Your brain is mostly fat,stored in the myelinated nerves.This sheath has a pivotal role to transmit electrical impulses quickly,20 times faster over the axons of these nerve cells.

Excuse me now this intermezzo on statins.

This myelin sheath is composed of about 40% water,but the dry mass is composed of80% lipids and 20% protein.The major lipid constituents of myelin are,cholesterol,phospholipids and glycosphingolipids in molar ratios of4:4:2,thus nearly half of the sheet is cholesterol.
Statins can,unnaturally,reduce cholesterol levels in the blood and since it traverses the brain blood barrier in the brain by up to 50%.Where then can the

brain get its cholesterol to uphold the quality of its myelin sheaths,if it is washed out of the nourishing bloodstream and thus in the long run washed out of its sheets?
Our brains have a natural ability to regenerate myelin by its oligodendrocytes,made from a type of stem cells in the brain,olygodendrocyte progenitor cells,but these cells also need cholesterol.
Emerging research has implicated experience and environment dependent regulation of myelination in the plasticity of the adult brain of which we will talk later.
I strongly believe that the increased prescription of statins is a cause of the increased prevalence of cognition impairment and I take a strong issue with pharmaceutical companies that pretend statins can prevent,MS,Parkinson,Down syndrome,etc.
Recent studies,analyzing the brains of deceased Alzheimers,have found that their pathology reflects the pattern of myelination in reverse which of course impacts negatively cognition.
A study that appeared in the American journal of pathology in may 2009 reported that “Statin Therapy Inhibits Remyelination in the central nervous system “
They concluded after their study on mice that “oligodendrocyte numbers were decreased during all simvastatin treatment regimens. Our findings suggest that simvastatin inhibits central nervous system remyelination by blocking progenitor differentiation”
James M. Ellison reported that”The link between cognitive symptoms and statins, furthermore, is supported by a couple of additional lines of evidence: first, some patients with this problem who noted improvement after stopping their statin medication experienced a recurrence when the medication was restarted.Second, a couple of small but well-designed experimental double-blind, placebo-controlled trials associated poorer performance on neuropsychological tests with the use of statins.”
Significant metabolic decline in the posterior cingulate cortex in lipophilic statin users was reported by another peer reviewed study.
In patients with mild cognitive impairment, taking lipophilic statins more than doubles their risk of developing dementia compared to those who do not take statins.
According to research presented at the Society of Nuclear Medicine and Molecular Imaging 14 June 2021 Annual Meeting, positron emission tomography (PET) scans of lipophilic statin users revealed a highly significant decline in metabolism in the area of the brain that is first impacted by Alzheimer's disease.

Many studies are sponsored by the multimillion revenue of the statin commerce. We do not let a fox supervise our chickens.
Clearly an independent study sponsored by the government is necessary to study the effect of statins on myelin in the central nervous system .
Pharmaceutical companies have too many billion dollars at stake to be objective.

Forgive me this biological and non philosophical intermezzo,but it shows once

more how our thoughts and actions are defined by our brains,the body of our minds.

Each one of our ancestors and each of ourselves is only a small, but necessary link in the ongoing chain of evolution to more complex brains.
Our brain is the most complex entity of matter that evolved as far as we know it today.Its structure and functioning are mind-boggling,knowing that it evolved out of stardust.
Spinoza said about man that “they are not created but only engendered,and that their bodies existed previously,though shaped in another way »
We have not (yet?) been able to transform dead matter into living matter whereas Nature did this,billion years ago,we still do not know how.
It is not when we transform an existing DNA into another one that we have created life.It is not the same as creating a new life out of “dead “matter.

The desire to stay alive ,the conatus,on the one hand and the desire to evolve,procreate and increase in complexity and consciousness,on the other hand,that is Substance.
Substance is in us as in everything else.
In men Spinoza calls this desire,the mind of God at work in Nature.
« In God there necessarily exists an idea which expresses the essence of this or that body under some form of eternity and so enables what is a temporal figure in the successive ages of life to subsist timelessly in eternity. »
Our existence ,each of us,as all that at present exists,is a necessary link to enable the future to become what it will necessarily be .
Through our present existence we are part of the future and of eternity.
Spinoza said , let’s not philosophize about death but about life.By thinking , by our brain,by thoroughly studying natural phenomena ,by what he calls adequate ideas,we approach Substance,God and eternity. Our ideas and thoughts,as our brain,are part of God,Nature and its creative force.
Clearly as we can see,for Spinoza ,there is more to Nature than just science and matter namely Substance.

The artist draws the bow,made of a hank of straight horsehair ,attached to a piece of hard wood, across the strings,originally made of animal gut,producing vibrations generating airwaves.These touch the eardrums and stimulate the auditory cortex triggering the cerebrum,the cerebellum ,neocortex and the lambic system deep inside the brain.As a matter of fact plenty of neural networks light up in a neuroscan of the brain when you listen to your preferred melodies.The whole brain lights up when you make music yourself.The pleasure centres release dopamine,a neurotransmitter that plays a part in controlling the movements as well as their emotional responses.The brain releases endogenous opioids,the same molecules created in social bonding,the runners’high.
A sally fluid chock full of protein,water,mucus and oil is released from the lacrimal gland in the upper,outer region of your eye,flows down the surface of your eye,your face and smears your mascara...

More so when it is Hilary Hahn who plays the first violin concerto of Max Bruch. A scientist will say,that is all the laws of nature that are at work.Spinoza says there is more at work,namely Substance.

The profound experience of beauty in Nature and real art is an experience of Substance,only explicable through art forms as clearly understood as among other poets,by Wordsworth.
Is there another purpose in poems and music than pleasure?
Spinoza defines pleasure,laetitia,as"the passion with which the mind passes to a higher state of perfection"and pain,tristitia,as "the passion by which it passes to a lower state of perfection".
Positive emotions make us more powerful,negative emotions bring us down.
We cannot confond the emotions that well up from our reptilian brain,like anger and fear ,with those emotions resulting from sublime beauty in music and arts,which are probably only possible in a human neo cortex.
Therefore.even though necessary,the study of animal,instinctif emotions ,fear and anger by the neurosciences in animals,cannot correctly represent the emotions present in a human six layered cortex.
But we will come to the neuroscience of emotions and Spinoza 's vieuws on emotions later.
Spinoza thus says that pleasure brings man from a lower level of power to a higher level .Things are good because they are pleasurable.Catholics did not agree with such statements and see pleasure rather with sceptic eyes.It is the commandments that defined good and bad.

In his 1836 essay Nature, the American poet Ralph Waldo Emerson identifies precisely this sublime substance in Nature « The greatest delight which the fields and woods minister," he writes, "is the suggestion of an occult relation between man and the vegetable. I am not alone and unacknowledged. They nod to me, and I to them." It's a phenomenon that he views as both an apprehension of the divine and a return to the child's perception of the world. "In the woods," he writes, "a man casts off his years, as the snake his slough, and at what period soever of life, is always a child. »
Will Durant wrote that William Wordsworth,a fanatical lover of nature,also caught a glimpse of Spinozas thoughts on Substance in his poem;

Something,
Whose dwelling is the light of setting suns,
And the round ocean,and the living air,
And the blue sky,and in the mind of man,
A motion and a spirit,which impels
All thinking things,all objects of all thought,
And rolls through all things.

These are also the sparks of intuition that Keats sought when he commanded us to "open wide the mind's cage'd doors".

The love of the earth ,the love and beauty of Nature so lovely described by George Meredith , who was nominated for the Nobel Prize in Literature seven times,in his poem :The Lark Ascending.
“The mind of God “as Benedict conceives it “is all the mentality that is scattered over space and time,the diffused consciousness that animates the world.All things,in however diverse degree ,are animated”.
Being really IN nature is being IN God.
In Hinduism this is called the universal principle,one eternal ,undifferentiated ,self-luminous consciousness.
Mind in matter ,as well as,matter in the mind,as said Bruno Giardano.For which,amongst other things,he unfortunately was hung upside down naked and burned on the stake...
How unproductive to kill off divergent ideas and liberty of expression.It at the same time retards the advancement of new and better ideas.
H Blavatsky,founder of the Theosophical Society,also compared Spinozas religious thoughts to Vedanta;”Spinozas Deity,natura naturals conceived in his attributes simply and alone,and the same Deity,as natura naturate or as conceived in the endless series of modifications or correlations,the direct outflowing results from the properties of these attributes,it is the Vedanta Deity pure and simple.”
Substance,in ourselves ,is the part that is more profound and universal in us than just our selves.It is this part that Spinoza said is eternal,the part through which we participate in eternity.Our Heritage and Legacy.
The being of Being is for him not a mere idea,it is the overwhelming,all encompassing,infinitely rich intuition of God,of which he finds confirmation in all thought,experience and Nature.
While a deterministic Natura Naturata would be a world safe for science, it should now be clear that Spinoza's doctrine allows for the solace of religion by a mystical turn towards something that is invisible to science, the eternal and unchanging Natura Naturans, the infinite essence and existence of God.By realizing our intimate connection to Nature and its creative power,Substance is at work in us,in all of us,all of Nature.Through our behaviour and thoughts,we realize that we are part and actor of eternity,divinity.
It is this experience, which can lead to the intuitive knowledge of our inherence as an eternal essence in Nature. We can In this way experience ourselves outside of time,a necessary link in the chain of evolution.
Let us listen to Spinoza;
“whatsoever is, is in God, and without God nothing can be, or can be conceived”
The slightest sparkling of our synapses ,creating the ideas and behaviour that follow from it,are an integral part of Nature,God,and submitted to the same laws,as we will document in the following chapters.
« Nothing in Nature is random. A thing appears random only through the incompleteness of our knowledge.” said Spinoza as Einstein after him. Einstein who called Spinoza his friend and was heavily influenced by his Philosophy ,said that nature does not play with dice,meaning it is not random.Therefore he never agreed with some of the ideas expressed in the modern theories of quantum

physics.Indeed,quantum researchers celebrate the notion that pure chance lies at the foundations of the universe.But once again,recent scientific papers oppose that view and confirm the deterministic nature of Nature.You can never rule out the existence of a pattern, just because you had failed to find one...
Everything that happens,had to happen,we live in a totally determined universe and we are totally determined like all the rest.
Please read on.

Chapitre 4

Oh there is a blessing in this gentle breeze
That blows from the green fields and from the clouds
And from the sky; it beats against my cheek,
And seems half-conscious of the joy it gives.

William Wordsworth

A. THE BODY IN THE MIND

It is in the mind body controversy that the genial power of reasoning of Spinoza made 'oa major philosophical contribution and where present day brain scientists have come to his aid to prove the validity of his intuition .

Descartes thought that each human being was composed of two substances: a mind, which has the principal attribute of thought; and a body, which has the principal attribute of extension, or physicality.
He made this distinction in order to mark as clearly as possible the scope and limits of the new mathematical science,which would be concerned wholly with the measurable properties of bodies in space.Nature was thus divided in Extension,the system described in mathematical physics,and the realm of Thought,which cannot be so described.Both are self contained and independent systems he said.It seemed to him that the mental or non spatial world could not be understood in physical terms.
This view famously leads to the difficult question of how these different substances could interact, known as the "mind-body problem".
Any two substance doctrine must obviously be embarrassed in describing human personality,for one thinks a person as essentially consisting of a mind and a body,each causally related to the other in some very intimate way.
Spinoza on this point clearly distances himself from Descartes and dispenses with a second dualism.As a rationalist without reservation,Spinoza argued that the two pervasive features of the universe must rather be interpreted as two aspects of a single inclusive reality.
Our ethical capacity generally has been seen by philosophers, as coming from the glory of our reason intervening in and overriding our (lowly) desires and emotions. We suppose that our desires and reason, i.e., our body and mind, are locked in a battle for control of our will, our moral triumph coming from the success of the latter over the former. And we confine scientific inquiry to that realm of law and necessity, the body, while locating our freedom in the independence of our mind from determination by nature.

Spinoza’s philosophical terminology of substance, attribute and mode makes all this sound rather technical and abstract. But Cartesian metaphysics represents a way of thinking about the world, and also about ourselves, still shared by most people.
If, as Spinoza argues, there is only one substance – God – which is infinite, then there can be nothing outside or separate from this God. Precisely because God is a limitless, boundless totality, he must be an outsideless whole, and therefore everything else that exists must be within God.
There can only be one substance,according to Spinoza,therefore mind and body must be one.
Since the seventeenth-century our standard assumptions in the West have stemmed

from Descartes, mind-body dualism, the independence of our thinking capacity from bodily,physical,determination, and the mind's openness to the world through knowledge in contrast with the body's narrow confinement to its bounds within the skin.

The mind,the ego,the will,the idea,the intellect,the self,intelligence,memory,consciousness,the trilogy (motivation,emotion,cognition),all boil down to only one thing,the brain or more precise ,the nervous system or still more precise, the trillions of synapses in it.These are the body of the mind.
Spinoza stated that "there is no idea of an idea unless there is first an idea"We must first have an idea how the mental works ,before we can define or understand it.Knowledge of the body before knowledge of the mind.Study and understand how the brain ,the body of the mind,works before we will be able to better understand the mind.We must first have an idea of an idea.
Once we better understand our,the human brain,the human mind,we will understand other minds,brains or nervous systems.
Body in the mind,matter in the mind.
We are nature and nurture,DNA and life experiences,are both written down in the synapses of our brains and their networks.
In this mind body problem the neurosciences,in the last decades ,finally come to help Spinoza through the knowledge we now have on the brain that was non existent in his days.
When I read, A critical guide to Spinoza's Ethics,edited by Yitzhak Y. Melamed in which 15 professional philosophy professors contribute their ideas,the idea of first studying the brain's workings
to understand the mind,and thus Spinoza's philosophy,mind -body,is non existent.
"to determine what is the difference,between the human Mind and the others,and how it surpasses them,it is necessary for us,as we have said,to know the nature of its object,I.e. of the human Body."said Spinoza.

"While the synapses themselves don't account for everything the brain does,they do participate crucially in every act or idea that we have,and in every emotion we express and experience.Synapses are ultimately the key to the brain's main functions,and thus to the self" according to neuroscientist Joseph LeDoux.
"Mental states, "always according to LeDoux,"are represented not only by the molecules,neurotransmitters in the synapses,but also by the intricate patterns of information processing within and between synaptically connected neural circuits.Chemicals participate in synaptic transmission,and in the regulation or modulation of transmissions,but it is the pattern of transmission in circuits,more than the particular chemicals involved,that determines the mental states.The essence of who we are is encoded in the brain,and brain changes,physical changes, cause alterations in mood,thought ,emotions and behaviour."
The physical natural laws are at work as much in the brain as in the stone rolling downhill.
One neuron transmits to another or thousands of other neurons that transmit to other hundreds of neurons etc.This is a biological mechanics.Causality is at work in our brain as much as in all of the universe.

LeDoux writes in his excellent book « The synaptic self » the following;« your self,the essence of who you are,reflects patterns of inter connectivity between neurones in your brain .A mind is not,as cognitive science has traditionally suggested,just a thinking device.It is an integrated system that includes,in the broadest possible terms,synaptic

networks devoted to cognitive,emotional,and motivational functions.More important,it involves interactions between networks involved in different aspects of mental life. »
Spinoza said of the subject nearly 400 years ago;
“The object of the idea constituting the human mind is the body.Will and intellect are one and the same thing.The decision of the mind,and the desire and determination of the body...are one and the same thing.The order and connection of ideas is the same as the order and connection of things.The intelligence of the body and the body of the intelligence are the same »
Throughout all his writings,whether on political,religious or purely ethical subjects,Spinoza is constantly pleading,in opposition to traditional theology and respectable opinion,for a purely,naturalistic,biological,scientific study of all aspects of human thoughts, emotions and behaviour.He was a neuroscientist or neurobiologist “avant la lettre”
The mind is a bodily phenomena confirmed Spinoza in a time when science knew about the brain little more than that it was situated in the skull.
In Descartes ‘ philosophy extension(body)and thought(mind) are two self- contained and independent systems.The mind ,he said,cannot be attributed any spatial relations or physical properties.
Descartes,like Spinoza,saw the physical world as a single and substantial system.However,Descartes was unable to account for the place of the mind within it.Our mental states,he said,ideas,seem to be linked to the physical world by causal connections,without being modifications of any physical substance,they are,he argued,essentially non physical,without place,shape,boundaries or movement.On this point Spinoza disagrees fundamentally with Descartes.When an old lady asked Descartes how the two completely separate substances communicate ,he came forward with the idea that it was the pineal gland that managed this connection.Not very different from the homunculus that is proposed to have this function in some present day publications...
Sometimes philosophers interpret Spinoza’s ideas
on body and mind as parallel attributes,they talk of parallelism,parallel lines never touch.There are no parallels,there is only one line.
Body and mind are one.
Some contemporary philosophers like Roger Scruton still have problems with the way Spinoza sees the mind and the body as one and subjected to the same laws of nature and causality ,when he writes"... the assertion of a causal relationship between physical and mental events is inherently paradoxical,perhaps even incoherent"or that “at no point in the elaboration of the system of ideas (of Spinoza)can intelligible reference be made to a physical mode,nor,in the elaboration of the science of extension,can intelligible reference be made to the mental.The two systems are incommensurable expressions of a single totality”
He also remarks that “Spinoza tries to explain this(consciousness)by proving that the idea of the mind is united to the mind in the same manner as the mind is united to the body.The proof is ,however,one of the least clear and least persuasive of his arguments,largely because it makes no mention of the crucial concept that is in issue: the concept of the self.True to the method of adequate ideas,Spinoza can find no way to insert,into the heart of his universe,the subjective viewpoint from which it is surveyed.”
This was written in1985.Descartes’s ideas are apparently hard to die.But an honest reading of “The synaptic self”,explaining recent scientific discoveries,cannot but persuade otherwise.
Karl Jaspers ,wrote in 1964 “...his (Spinoza)propositions are not without contradictions.In particular,it remains unclear to what extent the investigation of the relation between body

and soul is possible in practice and in what sense the parallel between two independent but coinciding series is to be taken.Mistakenly,yet encouraged by statements of Spinoza,the proponents of the so called theory of psychophysical parallelism in nineteenth century psychology invoke his authority.In any event it is necessary,in studying Spinoza,to distinguish between those conceptions of the world which are elements in his vision of the metaphysical being and of those of his ideas which are subject to confirmation or refutation in scientific experience.”
Neuroscientists are doing exactly that,studying the body of the mind and refuting the dualism mind body.
Karl Jaspers in 1957 writes »In investigating ourselves as what we are,we can proceed only within one or the other aspect,the mind or the body.To mix the two is confusing for knowledge and fruitless.In investigating the modes, we must remain within one or the other aspect; we must explain all bodily phenomena by the body and all mental phenomena by the mind »
We must excuse these philosophers because only a few decades ago little was known on the functioning of the brain,compared to our ever expanding and exciting new understanding of our brains and their mechanisms.
Nevertheless recently,in the excellent newspaper The Guardian,was written by Clare Carlisle that “modern science often regards the human being as primarily a physical entity, and attempts to reduce mental activity to physical processes. In Spinoza's view, however, it is incoherent to attempt to explain the mental in terms of the physical, or vice versa, because thinking and extension are distinct explanatory orders. They offer two alternative ways of describing and understanding our world, and ourselves, which are equally complete and equally legitimate.”
I am convinced that Spinoza would not have agreed with this part of the Clare Carlisle’s “Spinoza Walk “article in The Guardian,since he always considered that the mind must be understood by understanding its physicality,its body,the brain.The mind and its brain cannot be separated.The brain is the body of the mind,one cannot exist without the other.
Once again;Stuart-Hampshire in his book on Spinoza writes “The two attributes,the mental and the physical are still regarded as irreducible one to the other:but,as they are two attributes under which a single substance is conceived,the connexion between them must be more intimate than any causal connexion could be”.
They are not intimate,but the same.
Clearly ,the mind body problem still is not fully understood even among not so old philosophers,journalists and neuroscientists .
As the unity mind and body was incomprehensible in Spinozas days,the immense progress of the neurosciences in the last decades should be a convincing scientific proof that his intuition was correct even though it is counterintuitive...
Our thoughts and actions result from the physical brain.The body of the brain is made of biological matter only.
Our thinking and ideas must not be set apart from nature ,our consciousness is an integral part of it.
As Gilbert Ryle said,there is no ghost in the machine.
Neurotransmitters,electrons,cells,synapses,axons,myeline are all biological matter.There is no hocus pocus.There is not a mind controlling the brain.
There are only the laws of Nature that control the brain.It is a highly sophisticated biological phenomenon produced ,evolved,in Nature to improve our chances of survival.Its molecules came out and are made out of stardust and produce sometimes wrong ideas about ourselves.
Baroness,Susan Greenfield,also professor of synaptic pharmacology,hits the nail on the

head when she writes that"The biological basis of the mind,is the personalization of the brain through unique dynamic configuration of neural connections,driven by unique experiences."
As we will see further on,I would rather say,a brain,fully determined by our personal experiences,and the DNA we inherited.
Consciousness is simply the brain or nervous system at work.

There is talk sometimes of emergence in the brain, strong and weak emergence (Why not intermediate?)Meaning out of the brain comes something,like a Deus ex Machina,different from the things that normally come out of the brain,like ideas and behaviour.I see it as a new,modern day way,again,of wanting to separate the mind from the body,as both different,separate entities, exactly the same way as Descartes did in his days.I am hardly convinced as far as I could understand the scientific papers on the subject.
It is not because there are too many interrelated variables that we will never be able to put in mathematical equations,that a new physical entity "emerges".We will probably never be able to accurately predict the weather,for there are too many interrelated variables involved,but that does not mean that there is no causality,determinism,biological phenomena at work.The scientific adage puts it, "the absence of evidence is not evidence of absence"
The same goes for our trillions and trillions of flickering synapses.We will probably never be able to accurately predict their outcomes,what defines our behaviour.This does not mean that the laws of nature are not at work in the brain,or that something else "emerges",apart from our behaviour.Some people continue to look for justification of a moral agency,free will, in desperately far hideouts.
Eric Kandel ,Nobel laureate and predecessor and collaborator of J L LeDoux writes"...everything that occurs in the brain-from the most private thoughts to commands for motor acts-represents organic, biological processes."
Many people today still want to believe in the separation of mind and body.That these are completely separate non comparable entities .However,more and more scientific evidence is showing that this is an artificial distinction.What the brain communicates to the body depends largely on what messages the body is sending to the brain.Together they collaborate for the good of the whole organism.Biochemical processes in the brain,expressed in the flickering of the trillions of synapses in the neurological networks define our thoughts and behaviour .Every bodily change is a mental change and every mental change is a bodily change.Almost all brain function depends on feedback from many other areas of the brain and the body.We must not forget we are physical beings,not a kingdom in a kingdom.
Our brain,as our body,is submitted to the same natural laws as the rest of Nature Spinoza always stressed.
Our thoughts, ideas and values are physically,biologically determined.Our DNA and life experiences are physically,biologically printed in our synaptic networks as J LeDoux so marvellously and scientifically described in his book,The Synaptic self.

Spinoza thus dissolves another duality that existed in the philosophy of his age,and as we saw ,still among some of today's philosophers and scientists,the mind different from the body.As he clearly sees no opposition between God and Nature he also does not comprehend the duality mind and body.Spinoza was a complete master of Cartesianism ,the popular philosophy of the day.In his youth in 1663 he even wrote a paper; "The principles of Cartesianism geometrically demonstrated".This same method he employed afterwards in the Ethics .

He thus clearly understood the philosophy of which he rejected the dualism mind -body as well as the dualism God and nature.
In part two of The Ethics,on the Nature and origin of the Mind,he writes;”We thus comprehend,not only that the human mind is united to the body,but also the nature of the union between mind and body.However,no one will be able to grasp this adequately or distinctly,unless he first has adequate knowledge of the nature of our body.”
The neurosciences have since given us much much more adequate knowledge of the body,the nature of our brain.
He wrote”In view of the endless possibilities of our knowledge and of the fundamental coincidence of extension and thought(or in man ,of body and mind),we cannot tell what progress can still be made toward an organic explanation of the phenomena of life,which will throw light on this bodily aspect that today is only seemingly understood as an effect of the mind »
Spinoza thus foresaw the days,when we would have a much better understanding of the brain and the way it functions and defines our behaviour and thoughts.
Even though medical books still make a distinction between the central and peripheral nervous system,overwhelming research shows we better talk of the nervous system as one ,and fully integrated within the body,both with the same biological,physical constraints and determinism.
The functioning of the brain,the firing of the synapses follow the natural laws as do the galaxies in the universe,be it in the head of Homo sapiens ,a non human primate,or in the brain of the fruit fly of which we have shown a three dimensional picture on the cover of this book.

Ayurveda, Hindu medicine,states that all bodily disequilibriums or diseases start in the mind and the first symptoms of a disequilibrium of the bodies homeostasis are observed in the digestive tract.This is logic since it is the one nervous system that manages all bodily functions and homeostasis.We have as much neurons in our guts as a dog in his skull.That is why it is sometimes called our second brain.As a matter of fact diseases of the whole nervous system are more easily detected in the neurons of the digestive tract than in the brain,since these are easier accessible and extractable.Ayurveda starts to analyse the symptoms of the digestive tract to discover the disequilibrium of the body as a whole.
Not only is mind and body one,thoughts and ideas,the consequence of our firing synapses,are thus integral part of Nature and determined by the same immutable laws .Spinoza writes Proposition 29 in The Ethics”Nothing in the universe is contingent,but all things are conditioned to exist and operate in a particular manner by the necessity of the divine nature.”The brain as well follows these laws of Nature.
E.R.Kandel as neuroscientist Nobel prize laureate writes in his book,In search of memory,
“... the (neural)connections filter and transform sensory information the way to and within the cortex,visual information,relayed from one point to another along the pathway from the retina to the cerebral cortex,is also transformed in precise ways,first being deconstructed and then reconstructed-all without our being in any way aware. »Also he argues “Throughout this book(Principles of Neuroscience)we have emphasized that behaviour is determined by the functioning of the brain and that mental illness reflects the brain’s malfunctions.All functions of the brain,in turn,represent an interaction between genetic and developmental processes on the one hand and environmental factors such as learned on the other.”
Later on JLLedoux goes further than his teacher by stating and demonstrating that DNA and life’s experience are both written down in our trillions of synapses in his book ,”The

synaptic self".
Neural Darwinisme means neurons that fire together wire together,their synoptical connections grow stronger,forming neural pathways,networks and memory.Neurons that fire together wire together.Neurons that fire less together grow weaker synaptic connections,pathways,networks and finally memory.If neurons do not sufficiently fire together their connections disappear.In the first few months of our life even half of our neurons themselves disappear.Life experiences are physically written down in our neural networks as much as through our DNA.
Memory is distributed across many brain systems and are not always or even mostly available to you consciously,says LeDoux.
We could compare axons and synapses to branches and leaves of a tree.Leaves of a branch that catch sunlight make the branch grow stronger and develop,on the opposite leaves on a branch that catch less sunlight will stop the branch from developing or even make it die off.Darwinism is present in nature as it is in our brain.
There is a permanent battle going on in our brain for real estate,says David Eagleman.
Spinoza writes;
"Most of those who have written about the Affects, and men's way of living, seem to treat, not of natural things, which follow the common laws of nature, but of things that are outside nature. Indeed they seem to conceive man in nature as a dominion within a dominion. For they believe that man disturbs, rather than follows, the order of nature, that he has absolute power over his actions, and that he is determined only by himself. "
From all this ,it is clear that the mind body problem is closely related to the problem of the free will,moral agency ,the topic of the next chapter.
H M Ravven in her book "The self beyond itself"
correctly states"Accounts of free will or choice rely upon the mind being a different sort of thing and a different kind of cause from the body.We in the West see ourselves as harbouring a deep divide,and it underlies the claim of free will."
We will come to the subject of free will and meta plasticity in detail in the next chapter where it will become still more
obvious that the mind and the body are subject to the same physical laws as the rest of the universe.Not as Karl Jaspers wrote »It seems absurd to look for a bodily explanation for what is understandable to us as thought. Any inquiry that shuttles back and forth between one domain and the other ends in confusion. »
Let's liberate ourselves from this confusion by studying scientifically the brain and the incredible magic of its workings, brought about by evolution,the laws of Nature and Substance.
Spinoza had the intuition of the complexity of the brains'decision making process when he wrote;
« Our affects—our love, anger, envy, pride, jealousy, etc.— follow from the same necessity and force of nature as the other singular things.Nobody knows by what means or by what method the mind moves the body »
He had a clear intuition that an a priori physical science of the mental was as real a possibility as is any a priori science of the physical,since he considered the mind,the brain,submitted to the same physical laws of nature as the body.This for his days revolutionary idea most neuroscientists do not put in doubt anymore today.
« The idea, which constitutes the actual being of the human mind, is not simple, but compounded of a great number of ideas." Spinoza said more than 400 years ago.Unfortunately he did not have the same scientific knowledge of the brain that we have today,so he could not express his concept in a scientific vocabulary.
"The object of the idea constituting the human Mind is the Body,or a certain mode of extension which actually exists,and nothing else."

As time goes by neuroscientists have been less and less dismissive of Spinoza's ideas. J LeDoux as an excellent present day neuroscientist says that for many people,the brain and the self are quite different.His book on the synaptic self is a very convincing argumentation that this is not so.For him the self ,he writes,is"the totality of what an organism is physically,biologically,psychologically,socially and culturally.Though it is a unit it is not unitary... The self can be understood in terms of brain systems involved in learning and storing information,in explicit and implicit systems,about things that are significant in people's lives.The processing by these systems always occurs in a physical and social context (a situation)and is performed by networks that function the way they do because of both genetic inheritance and past experiences ...The key to individuality is not to be found in the overall organization of the brain,but rather on the fine tuning of the underlying networks...especially to the cells and synapses that constitute them"
In another book"The emotional brain",LeDoux writes;
"I view emotions as biological functions of the nervous system.I believe that figuring out how emotions are presented in the brain can help us understand them.This approach contrasts sharply with the more typical one in which emotions are studied as psychological states,independent of the underlying brain mechanisms.Psychological research has been extremely valuable, but an approach where emotions are studied as brain functions is far more powerful ".Such words would have come as music to the ears of Spinoza,who also studied and viewed the emotions as physical phenomena.These words are coming from a renowned neuroscientist with his own laboratory and who is at the forefront of the brain sciences in the US.
Spinoza always studied emotions as he would study any other natural phenomena.But more on that later.
Neuroscientists are discovering now what Spinoza said ;« the body can,by the sole laws of its nature,do many things which the mind wonders at."
For Spinoza there was no hesitation that the mind,the body, Nature are all following the same natural laws .The flikkering of the synapses in the brains is a Natural,biochemical phenomenon that is completely causally determined and follows the same laws of Nature as all matter in the rest of the universe.
Evolution is Substance at work in matter,in the brain.
When our mind thinks,God thinks.
"The human mind is part of the infinite intellect of god,thus when we say that the human mind perceives this or that,we are saying nothing but that God…in so far as God constitutes the essence of the human mind,has this or that idea"
"The human Mind is part of the infinite intellect of God."
Blessedness is the realization ,"the knowledge of the union that the mind has with the whole of nature"

B .THE MIND IN THE BODY

Thus matter in the mind ,but there is also mind in the matter as Bruno Giardano said first.There is not only body in the mind,but also mind,intelligence in all matter,even "dead"matter.
Leibniz(the last man who knew everything),was convinced that brain tissue,will never have a mind.
For him the mind is inexplicable by materially mechanical causes.He has been proven wrong by neuroscientists today.He also said that matter alone could never produce a

mind.Again he was proven wrong by evolution.Our brains evolved out of stardust.
He never agreed with Spinoza on the subject,who thought differently;
« For every thing there is an idea of that thing.In the case of a human body,the idea is the mind.The Universe is a system of thinking or animated things.”according to Spinoza:
“All extended things are also thinking things”
“All living things also think”
“The minds of humans differs only in terms of degree but not in kind from the rest of nature”
The union of individual minds with individual human bodies is for him only a special case of the general identity of the order or connection of causes in all of Nature.What he has written refers no more to man,or his mind,than to all other things,all of which are,though in different degree,animated,mindful.
The same Mind that is at work in our brains is at work in all the rest of the universe.Be it an atom,an electron,a quark ,a rock ,a supernova,a chimpanzee or a flower.Man is not ,let us repeat,a kingdom in a kingdom.There is an innate intelligence in every thing.
Man is not exceptional to the rest of Nature.
We do not agree with Stuart Hampshire when he writes “animals, being less complex in structure as extended or physical things,are correspondingly not complex enough,conceived as animated or thinking things,to be described as self-conscious or as having minds”.once again we think ourselves as above nature…Of course we should speak of a degree of mindedness in all of Nature.
For Spinoza’s natural philosophy there is no difference between the living and non-living as there is no difference between the conscious and the unconscious things.They are all represented as differences of degree of structural and organizational complexity.
All mind and all matter go hand in hand.
Otherwise how could there be evolution?
Cicero said in 44 BC “Why do you insist the universe is not a conscious intelligence,when it gives birth to conscious intelligences?”

Let us turn back the clock of Darwin’s evolution.
We,Homo Sapiens,the antropocentric,has consciousness,let us admit.He mingled with Neanderthalers at a certain time on our planet.
Do we refuse the Neanderthal consciousness?His predecessors?We make a jump to our cousins the chimpanzees.We give them a kind of consciousness or mind since he has a cortex even though smaller than ours, or did they loose it on the road of evolution?Jack in the box came out with Lucas,the first cell?With RNA in the grey area between living and dead matter?
Was it when two cells started to communicate,not by simple chemicals but by neurotransmitters and electrical signals?When we start calling them neurons we talk of consciousness or mind?When the connections were myelinated ?
Some say that mind « emerges »when neurons start to interact.
Or is it that consciousness was there from the beginning of the beginning?

Consciousness is a fundamental feature of all physical matter; every single particle in existence has an “unimaginably simple” form of consciousness.
Kevin J.Mitchell,who is a specialist in genetics and nervous system,talking about the individual cells in the human embryo says « The amazing thing about this process(to get brains and harts and limbs and eyes all made in the right places),is that none of the individual cells knows the plan.It all happens through a series of mindless biochemical interactions,with each cell reacting to signals from outside it,turning on some genes and turning off others ,and then passing that information on to its descendants as it divides

and the embryo grows.
Each cell carries all the information to make the whole organism but none of them sees it. »We could talk of the neurons in the bran in the same way as he does of the cells in the embryo or ants in a colony.They're like actors in a massive ensemble cast,all of whom know their own lines and their cues,but none of whom sees the whole script. »
All this she bang is directed by a lifeless ,single continuous molecule of DNA,a long string,made of a series of four different chemicals;adenine,thymine,cytosine and guanine, joined together in a double helix.
One cell arriving in the womb,has all the mind to create a new,unique ,fully fledged human being.
The same « thing » is happening in the brain;neurotransmitters are signaling molecules secreted by a neuron to affect another cell across a
synapse,creating our ideas and behaviour.
Particles come together to form more complex forms of matter .This isn't meant to imply that particles have a coherent worldview or actively think, merely that there's some inherent subjective experience of consciousness ,mind,in even the tiniest particle.Mind in matter is Substance.
God is everything but also God,Substance,is in every thing.
Evolution is Substance at work in matter.Spinoza
says the mind of God at work in matter.
The mind of god is at work in the human brain,as in a cat's brain,as in everything else and since the mind of god is eternal,therefore our mind is eternal since it works through in what comes after.In all the things it causes after it's physical destruction;books,ideas,music,DNA,children.It is part of the infinite eternal chain of cause and effect.

Substance is a necessary ingredient for evolution on top of determinism and the laws of Nature.
Whatever we have asserted of the idea of the human body must necessarily be asserted of the idea of everything else.
Otherwise how can we explain evolution if there wasn't intelligence in every thing from the beginning?
Did not stardust evolve into brains?From the Big Bang on ,as far as we know,matter has evolved from the simplest forms of matter to more complex and stable structures and later to organisms.
The brain is the most advanced structure of matter that we know of today.But why would evolution stop there.Why would our brain stop its evolution at the sixth layer of the cortex?
Evolution marches to ever increased ,continuous,consciousness.
There are no breaking points,living and non living,conscious and unconscious.
If all human brains would die through its stupidity, other intelligent,clumps of matter,"brains" will evolve out of the same stardust . Maybe there are already some…
« Nothing in biology makes sense except in the light of evolution," as the great geneticist Theodosius Dobzhansky wrote.
The Big Bang was Nature self created,evolution is Nature creating both embodied in Substance.

This body mind chapter is important because it is the groundwork,the fundamental essential on which the entire structure of Spinoza's system is constructed.Because if our mind works like the rest of the universe,physically determined by the laws of Nature,free will is an illusion.
It is from this embryo that his completely newly structured world vision evolves.
If you do not agree with,not understand this unity mind body,you will probably not agree with or understand most of the rest of Spinoza's construction.
It is exactly on this basic starting point that the neurosciences have come to assist Spinoza in areas where he was completely helpless in his days.Explaining the unity of the mind with the body.

Then,out of a correct understanding of Nature and our role in it,necessarily should follow a profound respect for it ,even if you do not want to give it a divine attribute.The environment,as part of Nature,on different levels,"minded "as ourselves,merit more respect than we presently show her in this age of the arrogant and destructive Anthropocene.
"Covid-19 was a warning shot from the whole of nature to our species," said Aaron Bernstein, a doctor at Harvard's Center for Climate, Health and the Global Environment.

I always collect and recycle litter, irrespectfully, thrown along the roads that I often walk ,for it distracts and spoils my meditation .
I thus observed that the kind of litter;beer cans(alcohol),cigarette packs (nicotine),junk food leftovers (insuline) ,coffee cups and energy drink cans (caffeine)show the same disrespect some people have for their body, nature,as they have for their brain.
We must start by recognising the intimate connections between people, animals, plants and our shared environment.
It all comes together.Let us not put evolution back to the Stone Age.

Chapitre 5

The eye it cannot choose but see,
We cannot bid the ear be still;
Our bodies feel, where'er they be,
Against, or with our will.

William Wordsworth

An enormous consequence of the recent discoveries in neuroscience as we saw in the previous chapter is that the existence of a free will,and thus of morality as we know it ,is an illusion.

"In the mind there is no free will,but the mind is determined to will this or that by a cause that is also determined by another and this again by another,and so to infinity"
"The will cannot be called a free cause,but only a necessary one."
The mechanism which Descartes only saw in matter and body,we saw in the previous chapter, Spinoza sees in the mind as well.Synapses flikker from one to the other in a causal determinism following the universal laws of nature,without our knowledge or control.DNA and life experiences determine the synapses.

"It is a world of determinism,not of design.Because we act for conscious ends,we suppose that all processes have such end in view;and because we are human we suppose that all events lead up to man and are designed to subserve his needs.But this is an anthropocentric delusion,like much of our thinking."wrote Spinoza.
If all Homo sapiens would disappear from our planet,certainly another brainy creature,maybe another primate,would evolve and maybe also think he is the master of creation ,that it is there for him and that he can pollute and diminish biodiversity at will...
This« hideous hypothesis »,the non existence of free will,as the basis of his philosophical system became generally famous .He wrote that "distinguishing human beings as exercising a rational free will as mere superstition,must be rejected,as we advance up the scale of natural knowledge. « gained him universal rejection.
But by better understanding our brain's functioning,Spinoza's ideas on free will should become less utopian, as we advance up the scale of natural knowledge,especially in the field of our nervous system.
The so-called free will is one of our most cherished narratives,which,according to the bible,began when Adam chose to bite in the apple even though God had forbidden him.
You should expect to meet bitter sentimental resistance from those whose desires,fears,loves and hates are tied to the « primitive superstitions"which represent persons as free and uncaused ,as having moral agency.

Spinoza was the first to apply with strict coherence the idea of an omnipresent determinism on thoughts,sentiments,human actions .In short,the human brain.
« There is as little freedom in the physical world as in the world of ideas,an effect follows from its cause with the rigid necessity of a mathematical proof.
Every human action,as a mode of God,arises out of the unbreakable chain of necessity.Therefore ideas such as chance or freedom cannot be given the significance as usual. »
“There is in the mind no absolute or free will;but the mind is determined in willing this or that by a cause that is determined in its turn by another cause,and this by another ,and so on in infinity.Men think themselves free because they are conscious of their volitions and desires,but are ignorant of the causes by which they are led “
“We can,in popular phrase,direct our thoughts at will,but the will,which we speak of as spontaneous,is really determined by laws as fixed and necessary,as those which regulate the properties of a triangle or a circle.”
The last choice we made was determined by the previous choice or choices,which were determined by a previous choice or choices and so on ad infinitum.
“It is impossible for man not to be part of Nature and not to undergo changes other than those which can be understood solely through his own nature and of which he is the adequate cause”
Spinoza is convinced that cognition is in agreement with causality and determinism.
Neuroscientists are slowly coming to agree with Spinoza.
E R Kandel , one of the first present day neuroscientists to doubt the existence of free will states ;“We no longer think that only certain diseases affect mental states through biological changes in the brain.Indeed ,the underlying precept of the new science of the mind is that ALL mental processes are biological-they all depend on organic molecules and cellular processes that occur literally in our heads.Therefore ,any disorder or alteration of those processes must have a biological basis ...The disciplines of psychiatry and neurology are being brought intellectually closer to each other.One can foresee the day in the not too distant future when resident physicians in both disciplines will share a common year of training.Most students of the brain believe that we are not conscious of most cognitive processes,only of the end result of those processes.A similar principle seems to apply to our conscious sense of free will”
J .L.LeDoux as a longtime disciple of Kandel states in his book “The deep history of our selves”that “Much of what humans do as we make our way through daily life is done without explicit awareness.Even when we are aware that we behaved in a certain way,it does not necessarily mean that we consciously controlled the behaviour.”
Damasio,a popular American neuroscientist writes;
“Human reason depends on several brain systems, working in concert across many levels of neuronal organization, rather than on a single brain center. Both “highlevel” and “low level” brain centers, from the prefrontal cortices to the hypothalamus and brain stem, cooperate in the making of reason. The lower

levels in the neural edifice of reason are the same ones that regulate the processing of emotions and feelings, along with the body functions necessary for an organism's survival.In turn, these lower levels maintain direct and mutual relationships with virtually ever bodily organ, thus placing the body directly within the chain of operations that generate the highest reaches of reasoning, decision making, and, by extension,social behavior and creativity. Emotion, feeling, and biological regulation all play a role in human reason. The lowly orders of our organism are in the loop of high reasoning "

Your cerebellum decides to regulate,among other things,your body temperature,without your permission or knowledge.

The cerebellum is the area at the back and bottom of the brain, behind the brainstem. The cerebellum has several functions relating to movement and coordination, including:

Maintaining balance: The cerebellum has special sensors that detect shifts in balance and movement. It sends signals for the body to adjust and move.

Coordinating movement: Most body movements require the coordination of multiple muscle groups. The cerebellum times muscle actions so that the body can move smoothly.

Vision: The cerebellum coordinates eye movements.

Motor learning and other functions.

All are executed without our knowledge or will.

We accept this of this part of the brain,but not for the cortex where ideas and behaviour are decided without your knowledge ,permission, or free will.

The cerebellum is called the autonomic nervous system but ALL the nervous system should be called autonomic,including our brain.It decides everything automatically and autonomically,without our "will".

Neurons,their dendrites and synapses,generate your ideas and behaviour with the same mechanisms and fluidity that they manage your food bowl from your mouth to your anus,all without your free will.

We are ,in the words of the late Nobel laureate Francis Crick,just a pack of neurons...

LeDoux would rather say a pack of synapses and neural networks.

We now know that there are neural networks in the brain,but only recently we found these are not static as we will see in later chapters.They change over time.As we saw the more signals are sent between two neurons through the synapses,the stronger the connection between these synapses become,this is called long term potentiation,LTP.Cells that fire together,wire together and form networks and by doing so they constitute our memory,learning and subsequently finally our behaviour.In practice this means the amplitude of the postsynaptic neuron's response increases .With each experience,thought or event ,the brain rewires its physical,structural networks.

Some of this neuroplasticity has sub seconds effects ,other produce life time changes in the neural networks.These changes are
physically observable in the brain.Not only do neurons change their synapses according to the number of times they transmit,also new connections can be created or destroyed,through dentritic growth and arborization when necessary.

Neuroplasticity,meta plasticity continually reshapes your brain in response to experiences.The fact that the brain seems static,merely reflects the consistency of your experiences throughout most of your adult life.
Spinoza considers the ideas and the things as the same modes , body and mind under different attributes.The cause and effect at work in the firing of synapses is no different from the rolling of a rock downhill.Therefore we can justifiably state that even though Spinoza may not be the first neuroscientist,he certainly was the first neurobiologist,or neurophilosopher as he often cites"The order and connection of ideas is the same as the order and connection of things".
Stuart Hampshire in his book "Spinoza and spinozism " correctly thinks that "It often seems that Spinoza had guessed,long ahead of time,that future discoveries in the physiology of the brain and nervous system would gradually reveal the amazing complexities involved."and that"When Spinoza writes of the still unknown or unrecognized powers of the body,he is certainly thinking of powers that would later be associated with behaviour arising directly from complex brain states,and hence also from the preconscious rather than the conscious mind".
Spinoza clearly saw nature,biology at work as much in the mind,the brain as in the rest of the body.
Our brain is the result of our life encounters,physical and mental and of all our sensory inputs during our life and from birth through our DNA.Both ,nature and nurture,come together in continually shaping our synaptic networks,and as a result define our behaviour.

A typical neuron fires 1 to 50 times per second.The neurotransmitters on the other hand are the non electric connections between neurons.These chemical neurotransmitters,modulate,excite or inhibit the receiving neuron of firing itself,thus activating or calming the brain activity.Thus our brain and our actions are decided by chemical molecules as well as electrical impulses.We give some of these molecules through our digestive ,respiratory,blood or nervous system,molecules that influence both the chemical and the electrical impulses.Some « consciously »and some unconsciously .Some are endogenous ,others are eaten,smoked,drunk ,rubbed,sniffed,inhaled or injected.We are blind to see the influence of daily used transmitters as théine,caffeine and nicotine on our synapses .
An anodyne neurotransmitter as caffeine,ingested by 90% of adults in the US,in mouse facilitates,increases synaptic transmission by 40%, and decreases by 35% the amplitude of long-term potentiation (LTP),the basis of learning and memory.Caffeine acts as an adenosine-receptor antagonist. This means that it binds to these same receptors, but without reducing neural activity which is the role of adenosine.We do not feel that our brain and body needs rest.Fewer receptors are thus available to the natural "braking" action of adenosine, and neural activity therefore speeds on.
The activation of numerous neural circuits by caffeine also causes the pituitary gland to secrete hormones that in turn cause the adrenal glands to produce more adrenalin. Adrenaline is the "fight or flight" hormone, so it increases your attention level and gives your entire system an extra burst of (fake)energy. This is

exactly the effect that many coffee drinkers are looking for.Unfortunately,there is no free lunch,what goes up,must come down.

It is hypothesized that during the addiction process to nicotine ,used by over half the worlds population,the drug misdirects the mechanisms that usually subserve learning and memory. Nicotine influences synaptic plasticity of the kind associated with learning and that plasticity as it occurs in pathways pertinent for addiction.
All chemical influences on the synapses and the resulting firing of them goes on independently from our will and consciousness.
How would we consciously choose from the 53 known chemical transmitters in our brain's chemical soup?
We have 10 times more glial cells in the brain than neurons.It was thought that these glial cells had only a supporting role ,but recent discoveries found that they have a more active role in the brain's plasticity and internal communication.
The brain is the materialistic ,biological consequence of our life experiences,life style ,sensory inputs,ideas and of course DNA.All come together in our synaptic self,and all are beyond our control.Nature and nurture define our synapses ,so convincingly and scientifically set out in « The synaptic self »written by J L LeDoux.
The effect of the synaptic firing ,which constitutes our behavioural outcome,and our thoughts,most people today have only very scant knowledge as already expressed by Spinoza in his days when he said that those who say they know how the mind works are charlatans.
John J.Ratey a neuroscientist ,not a charlatan,writes; »There is no center of decision or center of the will to act.These result from a confluence of activity from all over the brain that ends up in the frontal cortex,which is more extensively interconnected to all the brain regions than any other area.It is here at this confluence that the inputs compete and cajole,bump up against ethics and impulses and consequences;that memories are consulted and held or lost;that we struggle,combine and recombine ideas,work things out,consider goals and the steps to achieve them,reach above where we have been,and grow to reach a higher plane.Some ideas are boosted while others are inhibited,until the whole tangle is sorted and we come up with a new creation.All this computation,taking place across the cortex and coordinated by the motor neurons of the executive function ,is the very definition of many forms of cognition.The brain then turns to what might be termed classical motor function in response to the determined outcome ,instructing the muscles to act or not to act. All this is done by trillions of synaptic connections' firing."
All without our knowledge or control.

The neurological pathway of thirst that arises in an animals brain like ours is only partly understood.As far as we know the area postrema and nucleus tractus solitarii signal to the subfornical organ and to the lateral parabrachial nucleus,by way of the neurotransmitter serotonin. This signal from the lateral parabrachial nucleus is relayed to the median preoptic nucleus and the subfornical organ both

receive signals of increased osmolite concentration in the blood and other cells. Finally, these signals are relayed to the cortex ,specifically to the areas of the forebrain where the “feeling “of thirst arises “consciously”.
This is one “feeling”,we have as animals.
But imagine the intricate neural connections and calculations for the higher constructed “feelings”like hate,love,joy,sadness.
Can we,seriously,in any way,imagine having a control over these trillions and trillions of connecting synapses, that define our actions ,deeds,thoughts,emotions and sensations?If you think so,than Spinoza would say that you are dreaming with your eyes wide open.
Sam Harris,a popular neuroscientist and defender of the non existence of free will,says we are just biochemical puppets .Which,good for him,made him rich,unlike Spinoza…
Can we really decide which of the 53 different known neurotransmitters like dopamine,epinephrine,acetylcholine,histamine ,epinephrine,serotonine ,caffeine,cocaine,nicotine a
etc ,will be released or taken up by which synapses?The levels of glutamate and various hormones?The firing in the 176000 kilometers of myelinated axons existing in the 20 year old male?The speed of the influx of between 1 to 100 meters per second along the axon?A single neuron may be communicating across 100,000 synapses,therefore there are more possible ways to connect the brains neurons than there are atoms in the universe.The firing of a neuron lasts about one-thousandth of a second,so in one second,billions of synapses transmit information to billions of other synapses.
These connections,synapses, guide,define ,our bodies,behaviours and thoughts.Every thought and action our brain takes ,every event that reaches our senses,synapses fire and at the same time physically modify these synapses and their networks ,every millisecond of our lives.Some last seconds,some our whole life.
The description of the plasticity ,and certainly meta plasticity of the brain was heresy until only recently.Scientists longtime were convinced that the brain was as hardwired as a computer.
On the contrary,brain itself changes its connective patterns every millisecond throughout our lives in response to everything we perceive,think ,sense,do or don’t and what we experienced.Even when we sleep and dream.
We see the results of these firing synapses ,our behaviour ,and think it is WE who decided these results.Nonsense.We reason our behaviour post factum when are asked why we did this or that.
There is as much a causal deterministic relationship at work in our brains,neurons firing neurons firing neurons millions of times,every second of our life as there is in the rest of the universe.
Just try to control your next thought,impossible.
Synaptic connections are the material,biological results of our sensory inputs,DNA,thoughts,experiences and so on from before our birth and from birth on.All over which we do not have the slightest control.
There is more and more agreement,in the scientific community,that the firing of

our neurons determines not just some,or most,but ALL of our thoughts and actions.
Spinoza surely would not agree with Stuart Hampshire who wrote in his book on Spinoza ,when he writes;« It now seems questionable whether simple and definite causal explanations of human choices and decisions,explanations not substantially different in type from physical explanations,are likely to emerge from the study of psychology;this is at least considered an open question,which it is wise a principle of method,to leave open.Certainly we will always try to establish some systematic theory of human behaviour;but one cannot dogmatically forecast what form the theories will take or to what degree they will conflict with our ordinary pré-scientific descriptions of human conduct.These ,roughly summarized,are the historical factors which explain why Spinoza's form of determinism is now generally rejected. »
I ,and most neuroscientists,certainly do not reject Spinoza's determinism.
Descartes still hides in many places even in 1970.
Jonathan Bennett in his "Study of Spinoza's Ethics" writes"Spinza cannot have embraced comprehensive psycho-physical parallellisme ,presumably because he was too sensible for that."
He must be forgiven because he wrote it in 1984,at a time,we,and he,didn't know a fraction of what we know today on the brain's functioning.
Cause and effect is at work in the brains synapses as in everything else.

Neuroscientists nowadays believe that our most seemingly ironclad beliefs about our own agency and conscious experiences are dead wrong.

1 We do not control our brain.
2 We cannot escape the tyranny of our synapses.
We are controlled by our brain.
3 Our brain is defined ,causally determined ,like the rest of the universe,controlled,by the (biochemical)laws of Nature.
Life experience and DNA,determine the configuration of the brain.
Both are beyond our control.Our brain does not have a free will.You are not responsible for the configuration of your brain,Nature and its laws are.
4 We are controlled by the laws of Nature ,we,ourselves,our ideas, our behaviour.We do not have a free will,in the same way that a fruit fly doesn't have a free will.We are not special in the universe.

I do not see when there could have been a watershed moment on the evolutionary timescale,that we can say free will appeared in a living organism.
Is it when Adam bites in the apple even though it was forbidden?When the chimp turned into a Neanderthal,when the Neanderthal evolved into Homo sapiens?

Patricia Churchland ,professor at U C does a wonderful job of popularizing neuroscientists' findings, but she sees the possibility that we can have some form of self control ,she considers ,is,
a form of free will .

In her book”Touching a nerve”she writes;”With some disappointment,I am bound to say that I suspect that the claim that free will is an illusion is often made in haste,in ignorance,and with an eye for the headline and the bottom line.What is not illusory is self-control.”
She states that”By learning and thinking and developing good habits,we give our unconscious brain better tools to work with.”On this,I certainly agree,but these elements are unfortunately all causally determined,beyond our control,registered in our prefrontal cortex who exerts social control.
But that part of the brain works like all the rest of the brain.
We as an individual do not have control over the DNA and life experiences that in the end ,make us learn,think and develop “good”habits the way we do, even thought they define our brain and behaviour.
You do not choose your parents(DNA)nor the things that happen to you starting in the womb (life experiences)or even before.

Education ,learning self control ,is a part of life experience over which we do not have a control as an individual,but rather as a family,a society or a group .Self control is a value that is learned.It is defined by life experiences.
Churchland thinks that we should consider how much control we have in any given situation. The greater the control, the greater the responsibility.
Unfortunately our control,in ALL circumstances,is nihil and thus we are not responsible for our actions.
Michael Gazzaniga also professor of psychology at UC says that « Your brains are automatic but people are free »is a contradiction .He is willing to give the individual a certain moral agency even though he admits that the brain is determined.He hides his mind body dualism,in other words,he is compatibilist.
I admit it really is hard to let go of notions like ;sin,retribution,heaven and hell for many people
with a catholic or judéo-christian upbringing or who are teaching at catholic or Jewish universities as it was in Spinoza’s time.
Doubts come often from our religious beliefs.
Israeli philosopher Yitzhak Y. Melamed,retakes writings of Fichte from1797 in his Second introduction to the Wisseschaftslehre ;”Spinoza could not have been convinced of his own philosophy.He could only have thought of it;he could not have believed it.For this is a philosophy that directly contradicts those convictions that Spinoza must necessarily have adopted in his everyday life,by virtue of which he had to consider himself to be free and self-sufficient…”He probably thinks here about Spinozas saying that rationalism,looking for the causes ,makes men free.
This ,wrote Fichte ,is where Spinoza went astray,and this is how came to place his speculations in contradiction with his life”
In our chapter on liberty we will explain how we can be free in a determined universe which Fichte in1797 and Yitzhak,and Allan Wood in 2017 did not comprehend in “the Critical guide to Spinozas Ethics”.
Yitzhak said”I think Fichte was right in ascribing to Spinoza the view that we can never liberate ourselves from the belief in free will.The psychological

mechanisms that elicits our belief in free will accompanies us at every moment of our lives,and such a ubiquitous psychological mechanism seems impossible to dismantle."
I would permit myself an advice ; scientific knowledge on the workings of the brain should help us dismantle that feeling that we do not have a free will.
Even Stuart Hampshire,one of the most prominent British philosophers,who studied Spinoza all his life stumbles when he writes"As thinkers,we have a narrow freedom within the common order of nature,as bodies we are the victims of external causes in the common order of nature".We do not have ,even a narrow freedom.He also writes"A finite mode,such as a human being,has a greater power and perfection in so far as its successive states or modifications are less the effects of external causes and more the effects of preceding changes within itself".
Stuart must be excused when he writes"it now seems questionable whether simple and definite causal explanations of human choices and decisions,explanations not substantially different in type from physical explanations,are likely to emerge from the study of psychology;this is at least considered an open question,which it is wise,as a principle of method,to leave open."
It is not from the study of psychology,but from the study of the brain that we can close the question.
Spinoza was always convinced that as our knowledge on human behaviour would become progressively less inadequate,our idea of the idea,we would scientifically understand how determinism is also at work in our behaviour,that is our brain.For him this was never an open question.
Stuart thinks that Spinoza's form of determinism is now generally rejected,since Stuart cannot reconcile it with free will.Once again he thinks humans think differently from animals,only because we have a bigger cortex…
He wrote "Human beings,at the top of the scale,can be completely self-determining when their activity is continuous thought,at such moments men rise above their normal human condition as finite modes."He did not fully accept the way Spinoza sees the mind body controversy,as J Bennett.
As long as you do not fully accept the determinism in the brain,you will never fully understand Spinoza's philosophy.
We are completely,not more or less,determined by external causes,our bodies AND brains.
Stuart pretends "the mind is relatively free and active in its thinking when the body is relatively in a constant state in relation to its environment,and is freely functioning without great exchanges of energy."
We,our mind,is never,ever,in a " free" state in relation to its environment ,past or present.
The brain is determined and so are we,like all the rest in the universe.Amen.
Some people believe in a "soft"determinism or compatibilism,a free will is supposedly compatible with determinism.
"Man can do what he wills but he cannot will what he wills." wrote Arthur Schopenhauer.

Some people do believe that everything is determined ,including the brain.But if our brain is determined, how can we possibly be free to choose?
Arthur ,as Stuart and so many philosophers,think man is above Nature,not submitted to its laws,a disguised dualism between body and mind,we are above or outside ,nature.

Sometimes people bring in a “wild card”the fact that we cannot predict the position of particles in quantum mechanics.They take thus the argument of determism invalid,and (I do not exactly see how)make possible the existence of free will .
Determinism would not be universal.
But is it that because our scientists cannot ,(yet?)predict the position of those particles,that it “looks random “,that there is no determinism?
Einstein,a hard determinist,never agreed with this and said it is because we do not know or understand all the causes.
I find Robert Lanza in his book “Beyond biocentrism”rather negligently drops determinism after observing one inexplicable phenomenon observed in the quantum world,that we cannot predict the position of these quantum particles.Suddenly randomness replaces determinism.He throws the baby out with the bath water.
We cannot accurately predict the weather , but that does not mean there is no determinism.Either we do not know all causes or there are too many to put in equations.
We will never be able to predict the outcome of the trillions of synapses firing,but that doesn’t mean there is no determinism.
David Eagleman seems to doubt the existence of free will because we cannot predict the outcomes of the brain’s computation. »even though neurons follow straightforward physical rules,in practice it will always be impossible to predict exactly what any individual will do next » and « At the moment,neuroscience doesn’t have the perfect experiments to entirely rule free will out. »but he also says that »our lives are steered by forces far beyond our capacity for awareness or control »
He wants to keep all his readers happy.
It is not that because we cannot predict the outcome of the throwing of dice ,that the outcome is random,that the dice are not determined by the laws of Nature.The outcome is random,but the dice are determined.
The outcome of the flipping of a coin is random but the coin is determined.The gene mutations are random but the mutation itself is causally determined and we cannot predict its outcome,since we do not know the cause(s).
Kevin.J Mitchell writes »All the processes of neural development;patterning,proliferation,differentiation,cell migration,,axon guidance,synapse formation,rely on differential gene expression and on interactions with proteins.This means that each of these processes is subject to noise at multiple levels.As a result,none of these processes in developing embryo is deterministic. »
It would be more honest to say,we do not know the causes of the « noise «

,which causes the probabilistic nature of neural development.
God does not play with dice even though Robert Lanza thinks so and that would make the universe conscious .His examples of randomness are dead wrong,but I can brake bread with him when he says that “life and awareness are indispensable cosmic attributes “ and that “Nature is innately smart,and intelligence is part and parcel of the whole shebang”.Unfortunately he comes to this by the wrong meanders.
The quantum“wild card”looks more like the pineal gland of Descartes as another desperate justification for the existence of free will that we have a problem abandoning.
Physicists Sabine Hossenfelder and Tim Palmer ,quantum physicists ,have argued that what they call superdeterminism "is a promising approach not only to solve the measurement problem, but also to understand the apparent non-locality of quantum physics."
John Bell another quantum physicist but also philosopher,said that the measurement problem,is not a problem since the scientist that does the measurements is also determined…He also believed in superdeterminism the way Einstein did.
Anyway ,I cannot see how randomness can give us a free will.
But let us leave those discussions to quantum physics scientists to sort this all out.

Dr Heather Berlin ,a neuroscientist with an impressive cv,and very good looks,talks about the conscious brain and the unconscious brain.As if there were two distinctly different qualities to two distinctly different parts .Traditionally in textbooks ,the nervous system ,is separated in two parts;
the central ,being the brain ,and the peripheral,all the rest and in these parts ,once again a separation is made of autonomic and non autonomic,being conscious and unconscious.
According to her,the unconscious part of the brain ,would do some decision making and then transfer the result to the conscious part.The conscious part she sees in the pre frontal cortex which effectively is the most specific human part of the brain,where social control is worked out,while the non pre frontal cortex is the unconscious part of the brain.
David Eagleman in his TED talks speaks of the mind and the brain,the conscious and the unconscious mind or brain.He says MOST (?)of our decisions are made by the brain.No,all of them are made by the thing « under the hood »He says free will is a small player in the system..Many scientists do not dare to go all the way.He also,understandably,never specified which part of our brain is the conscious part.
This ,again,is a disguised dualism mind and body.We have seen the pineal gland,the homunculus, the pre frontal cortex,the conscious and unconscious mind.We will hear in the future still of other genially disguised dualisms.
As I said earlier,the whole brain is autonomic.
There is no part of our brain that we control,or over which we have decision making power.It all works according to the laws of nature, not only parts of it.

The prefrontal cortex ,I agree,is the most densely connected part of the brain and is important for social harmony,but does not work differently from the rest of the brain.It is the prefrontal cortex himself who decides our social control.We do not have control over it as some say,at any time over any part of the nervous system.She thinks we have control,or can let go of the control of the frontal cortex,it is the more “conscious”part of the brain so we have a free will, through our pre frontal cortex.(if that part of the brain is not damaged.)
She probably read Miller and Cohen ,also neuroscientists,who proposed an Integrative Theory of Prefrontal Cortex Function, that arises from the original work of Goldman-Rakic and Fuster, also neuroscientists.The two theorize that “cognitive control stems from the active maintenance of patterns of activity in the prefrontal cortex that represents goals and means to achieve them. They provide bias signals to other brain structures whose net effect is to guide the flow of activity along neural pathways that establish the proper mappings between inputs, internal states, and outputs needed to perform a given task”.In essence, the two theorize that the prefrontal cortex guides the inputs and connections, which would allow for cognitive control of our actions.But that does not mean WE controlled the rest our brain through the pre frontal cortex.It is the prefrontal cortex that elaborates with the rest of the brain,since it is highly interconnected,to decide the outcome.It is not that because the prefrontal cortex in humans occupies a far larger percentage of the brain than in any other animal. And that it is theorized that, as the brain has tripled in size over five million years of human evolution and the prefrontal cortex has increased in size sixfold,that it works differently from the other parts of the nervous system,or that we have control over it.
Once again this is putting man above nature ,higher than on a Piedestal.

An Italian neuroscientist and psychiatrist,Giulio Tononi has an integrated information theory,ITT,of the brain,which he says has implications for free will.He says “ITT requirements for true existence has the need for indeterminism “.He sees a cause effect power between neurons in the brain,but it pre-supposes a trade-off between determinism and indeterminism.
I must sincerely admit I haven’t understood a iota of his exposé on you tube that lasted nearly one hour and a half.Nevertheless since indeterminism in the actions of the neurones is part of his theory ,I am very sceptical of his conclusions,and leave it by that.

Some say we have moral agency(thus free will?)when we were warned or knew that the action we were going to take was immoral and not if we did not knew or did not understand.This idea does not come from a neuroscientist because otherwise you know that all that comes to the senses is registered in the synapses as memory.Beliefs, values,life experiences all are part of the calculations of the synapses.
If you didn’t have some values,beliefs,life experiences,of course they will not be part of the synapse’s calculations.But that doesn’t mean that makes you responsible.As I said ;nobody is responsible for the configuration of his brain,fully

defined by DNA and life experiences ,both out of our control.When the necessary information was obtained and was written down in the synapses,and still you acted improperly or “immorally”you are still not morally responsible,since it was the brain that decided for you.

Some say,we have to believe in free will,we have no other choice.
They clearly have in mind all constructions of society and religion that are based upon it.
I think that is the politics of the ostrich to put your head in the sand.You do not want to see the mountain of consequences.
They cannot face the inevitable consequences,because since there is no free will ,obviously,moral agency also is an illusion and the whole morality house society has constructed,crumbles down like a house of cards.The morality’s standards in religion,education,secular society as a whole.
Does this mean that laws become unnecessary,superfluous as some pretend?
Another misunderstanding.
We must differ between ; religious law,human law and finally the universal laws of nature.
Human law can be transgressed but you go to jail.
When we transgressed religious law we sinned,but is must be clear by now that since there is no free will for Spinoza,the concept of sin,hell, damnation etc are superstitions.Nevertheless he considered religious law still useful for the”vulgar” but superfluous for the virtuous.
The laws of Nature cannot be transgressed.That is why Spinoza never believed in miracles.
Everyone wants to be rational, yet 75% of Americans believe in at least one phenomenon that defies the laws of science…
It is not because there is no free will that human law
or,even religious law is superfluous .That we do not have to guide humans for an harmonious functioning of society,protecting all citizen’s liberty.
When Einstein as a convinced determinist,was asked if a serial killer could have done otherwise,he answered no,but immediately said he should be locked up.
The non existence of free will is compatible with a justice system,even though not in the same form as we know it today.Retribution does not have a place in it.
Unfortunately we have to supervise human behaviour with carrots and sticks ,since we are only finite modes,with human laws ,religious laws and a justice system.The liberty of one ends where the liberty of the other commences.Spinoza said the state’s role is to procure liberty for ALL its citizens.Societal law remains useful and necessary.Only it is not strictly necessary to shop off hands and heads,hang “criminals”or simply shoot them.Teaching,education and reeducation seems the more humane way.
Retribution effectively is misplaced once you do not believe in free will.
So what?We live and let live?That is your karma?We become fatalist?
We still have to use our reasoning ,six layered cortex,and fortunately,as a society we still have free decision making.
Since,on DNA we do not have control(yet?),we still can and should influence

behaviour through education.Education finally is instilling the right values into synaptic networks,as we do in psychotherapy.Wiring and rewiring the synaptic circuits.
But let's that for another chapter.

As we saw ,still today among scientists ,philosophers and many people,a distinction is made between the mind and the body and therefore most of us continue to believe in moral agency,free will.The idea persists and is hard to die, that a duality exists between the self and the brain or the mind and the body,and that there would be a communication between both.Therefore the self or moral agency is still sometimes located in a certain particular part of the brain,like in the homoncules ,in the same way that the pineal gland was proposed by Descartes.The duality mind and body and therefore the illusion of free will,still is very well alive today hundreds of years after the death of Spinoza.
Nearly one in two you tubes accepts the existence of free will.
A cross-cultural study examining intuitions about free will and moral responsibility in subjects from the United States, Hong Kong, India and Colombia was done by Sarkossian et al .The results revealed a striking degree of cross-cultural convergence. In all four cultural groups, the majority ,over75% of participants said that (a) our universe is indeterministic and (b) moral responsibility is not compatible with determinism .
The logic consequence of this is that the majority of people believe in moral agency since nature and we are not determined.

Even if we do not like it,the trillions of synapses are like an orchestra without a conductor or a fixed score,but whose players are so good at collaborative improvisation that wonderful music keeps flowing out of it,all without our conscious awareness or free will.There is no little man sitting in the center of the brain directing the orchestra.
The biochemical laws of Nature direct the orchestra.For Spinoza it cannot be that the will would be an uncaused phenomenon in the universe.
We ,or our brains,are not a dominion in a dominion.
We must abandon this so cherished and humancentered belief of free will and transform our penal,educational and religious morality as a consequence.
Listen once again to our friend;
"Will and intellect are one and the same thing.Men are mistaken in thinking themselves free; their opinion is made up of consciousness of their own actions, and ignorance of the causes by which they are determined.The infant believes that it is by free will that it seeks the breast; the angry boy believes that by free will he wishes vengeance; the timid man thinks it is with free will he seeks flight.That human freedom which all men boast of possessing … consists solely in this, that men are conscious of their desire and unaware of the causes by which they are determined." For Spinoza, belief in free will was just as much a sign of ignorance and superstition as belief in miracles worked by divine intervention.
Nowadays ,since the last decades,and especially this last decade,we know much

more on the brain's decision making process than in the days of Spinoza.
He was right ,then,in his days,when he wrote;
« What the will is, and how it moves the body, they none
of them know; those who boast of such knowledge, and feign
dwellings and habitations for the soul, are wont to provoke
either laughter or disgust "
« Will cannot be called a free cause,but only a necessary cause «
Today,neuroscientists do not invite laughter or disgust,on the contrary,neurosciences are some of the most prominent scientific domains of the last decades,attracting the best in science.
New technologies have revolutionized our ability to look deep into the brain's structure and action.
As we will see further on,that ,when one renounces to give a free will to others,when one renounces men's moral agency,when one admits that other's actions are not "deliberate",but the result of a chain of causes,events,life experiences and DNA,that are completely out of their control,life becomes a lot more "zen".
Entitlement,for the same reasons ,is a misplaced attitude.It is wrong to believe that one is inherently deserving of privileges or special treatment.

Spinoza concludes that "A person who sees the necessity of things ,regards their passage with calm and composure.",since things could not have been otherwise.
One remarkeble person,who probably also believed in determinism and causality famously said;
"Father, forgive them, for they do not know what they are doing."
And they divided up his clothes by casting lots...
Spinoza considered Christ a virtuous person,but still a man.The certainty of God,the love of God,all these he found in Jesus the man. »Christ possessed such perfection as no other man. »he wrote.

Accepting determinism and the absence of free will toward others ,as toward ourselves,can better heal our psychological wounds ,and make us love ourselves and others the way they are ,accept life as it comes to us.It frees us from a great deal of shame and self blame ,when we see the neurologically determined origins of our challenges.Much of the shame,guilt,and self-loathing dissolves,as these are no more considered problems of morality.
You will have a Mona Lisa smile on your face ,even at rest,when you accept determinism all the way.
A study in 2017 by Casper Et Al observed that
"Disbelief in free will had a positive impact on the morality of decisions toward others"even though most people think otherwise.
Since we do not do things deliberately,freely,nor do the others,something that ,at first glance ,irritates ,should less affect us.Since we cannot hate all causes that led to a certain behaviour we cannot hate that behaviour.
The knowledge of « bad » behaviour is inadequate knowledge,says Spinoza.
Nobody is responsible for the configuration of his brain circuits,fully defined by

DNA and life experiences,out of our control.
Recent studies in the UK and the US confirm that most convicted offenders had an experience of trauma, abuse and violence at least four times higher than the general population.Experiences out of their control.
If you would have come out of the criminals' mother womb,and walked from birth in his shoes,you would definitely have become a criminal also,no escape.
The acceptance of determinism and the absence of free will still has a long way to go in society as well as in criminal law and education.
The year 2015 has seen a strong increase in the number of executions in the world.At the least 1634 people have been separated from their head,hung,killed by lethal injections or simply shot, according to Amnesty International . Some American states still lock up juvenile offenders for life.
Worse,up to the year 2005 ,minors have been executed in the USA.Only that year has the Supreme Court decided to stop those executions saying it was "unconstitutional ",but the real reason was that it looked rather bad internationally,as there were only three other countries in the world left,that executed convicted minors,in whose company it was better not to be seen...
On the second of July 2021,US attorney general finally has imposed a moratorium on ALL federal executions while the justice department reviewed its policies and procedures on capital punishment,a step longtime overdue.
The year before ,July 2020 ,the Supreme Court of the USA had authorized again executions of minors after an interruption of 17 years...
In 2020 Saudi Arabia said it would no longer execute people who committed crimes when they were children. It also banned flogging as a punishment. But the beheadings continue: 184 people were separated from their head that year, a record for the kingdom.
In Japan,where death row is still in place,opinion polls, show high levels of public support for capital punishment.
Writing individuals off for life is not just callous. It also is economically inefficient. Society will be better of,if more jailbirds find jobs after wards.Teaching professions in jail and re-education should be much more adopted .
I am convinced that a hundred years from now, many people will look on the present day incarcerations as abhorrent, based on the presumption of a free will ,moral agency and or retribution.
The same goes for moral agency in our educational system and in religious morality.

The pineal gland,the homunculus (in the shape of a miniature human body,)emergence,(hard and soft)quantum theory,are all desperate inventions to protect our most cherished belief and try to confirm our intuition that we must have a free will.
At the same time we don't have to admit that we have been doing wrong in so many ways to so many people for such a long time.

Chapitre 6

One impulse from a vernal wood
May teach you more of man,
Of moral evil and of good,
Than all the sages can.

William Wordsworth

As we saw in the previous chapter,free will and moral agency is an illusion.Therefore our definitions of good ,bad and ugly,must be revised.

Spinozas destructive analysis of the basis of ordinary moral judgments,and of the standards that they imply,follow directly from the basic propositions of his logic we saw in the previous chapters,causal determinism and thus absence of free will.
The root of the greatest errors in philosophy lies in projecting our human purposes,criteria and preferences into the objective universe.Hence our problem of evil:we strive to reconcile the ills of life with the goodness of God,forgetting ,that God is beyond our little good and evil.Good and bad are relative to human and often individual tastes and ends,and have no validity for a universe in which individuals are ephemera,writes W Durant in The story of philosophy.
Spinoza though goes further;
“Whenever then,anything in nature seems to us ridiculous,absurd or evil,it is because we have but a partial knowledge of things,and are ignorant of the order and coherence of nature as a whole,and we want everything to be arranged according to the dictates of our own reason;although in fact,what our reason pronounces bad is not bad as regards the order and laws of the universal nature,but only as regards to the laws of our own nature taken separately.As for the terms good and bad,they indicate nothing positive considered in themselves.”
Warren Zev Harvey said that”Spinoza’s remarks on final causality and anthropocentrism are more extreme and unambiguous than Maimonides,they bear their unmistakable imprint”
Spinoza called “the ignorant” people who follow their imaginings and believe all things have been made for their sake,as the “great” Jewish philosopher Saadia Gaon wrote in his Book of Beliefs and Opinions.He said that human beings are the center and the goal of the universe.
Such anthropocentrism is still very alive today and the origin of so many erroneous ideas.
Good and bad are bound up with the notion of final ends for Nature,which is an absurdity for Spinoza as it was for Maimonides.We put Nature on the same footing as men who are finite,an insane idea for Spinoza.
« I have made a ceaseless effort ,writes Spinoza,not to ridicule,not to bewail,not to scorn human actions,but to understand them”
Since all effects have a cause or causes which are again caused by other causes and so on ad infinitum,we cannot possibly know,or understand all the reasons,causes for a phenomena or human action.Also we cannot say all causes were good or bad ad infinitum.Even if we knew all the causes, which is impossible,we cannot judge human action,since they are determined by outside causes over which one does not have any power .They are determined by causality and the laws of the universe.What will be,must be.What was had to be.
Remember,nobody is responsible for the infrastructure of his brain.

Let us read what he wrote in his Ethics at different chapters on the subject.
”What exists is perfect,not existing is the only imperfection.”
“The more clearly you understand yourself and your emotions, the more you become a lover of what is.Only in relation to our imagination can things be called beautiful or ugly, well-ordered or confused.Do not weep. Do not wax indignant. Understand.”
“From all this, then, it is clear that we neither strive for, nor will, neither want, nor desire anything because we judge it to be good; on the contrary, we judge something to be good because we strive for it, will it, want it, and desire it.”
“As far as good and evil are concerned, they indicate nothing positive in things, considered in themselves, nor are they anything other than modes of thinking, or notions we form because we compare things to one another."
“We should understand the terms "good" and "bad" as analogous to "healthy" and "unhealthy": value is a question of what is good for me, or bad for me.”
He argues that "one and the same thing can, at the same time, be good, bad, and also indifferent". He illustrates this point by suggesting that music is good for someone who is depressed, bad for someone who is in mourning, and indifferent for someone who is deaf.
In denying absolute moral values, Spinoza looks very much like a precursor of Nietzsche, who is well known for his criticism of morality – and, indeed, Nietzsche's view that we need to move "beyond good and evil" ,to a less moralistic understanding of value was clearly influenced by his reading of the Ethics.
When we say a person is bad this implies that we say his DNA is bad or that his life experiences were bad,that therefore his synaptic networks are bad ,that his parents ‘ DNA were bad and ,or,that they did not give appropriate education .Their parents and grandparents also ad infinity.Since everything has a cause which in itself has a cause and so on ,saying that something is bad means saying all the causes are bad.Since all things are causally determined and interrelated,everything then is bad or good?
Moral and aesthetic judgements are relative to the attitudes and interests of the subject in a particular environment at a certain time and contain only the most confused apprehension of the nature of things,his own particular desires and ambitions.
Spinoza understands by good only that ,”which we certainly know to be useful to us,by bad,that which we certainly know which will prevent us from partaking of any good “
He thus completely changes the way we should evaluate “we strive towards,desire or long for nothing because we deem it to be good,but on the contrary,we deem a thing good because we strive,wish,desire or long for it.”
These words must be have been words of the devil for most of his contemporaries.Religions consider themselves best placed to define what is good or bad.It is not to the individual to decide wat is good or bad.Spinoza on the contrary prefers we must follow our instincts,our Nature to decide what is good or bad.Subjects should not mere follow religious laws,but rather their individual feelings .
God has no intentions with the world and asks nothing of men,otherwise he would ask himself.Equally men have nothing to ask of God.
To think of things or persons as fulfilling,or failing to fulfill a purpose or design in Nature is to imply the existence of a creator separate ,distinct from his creation, an imperfect Nature,this according to Spinoza,is demonstrably a meaningless conception.
Phrases as ,the purpose of human existence,are phrases that survive in popular philosophy and language only as the ghosts of Aristotle.
“In ordinary moral praise and condemnation,we imply a reference to some standard or ideal of what a person should be and assume a purpose or design in human existence.”
“To say that someone could,or should have done better is necessary false .It is always a reflection of an incomplete knowledge and understanding of the causes.”

We see that Spinoza could allow no sense in which good or bad can be applied to persons as much as it cannot be applied to a stone ,a lion ,a flower or a virus.
The lion wants to eat the antílope,the antílope wants to run from the lion,they both do wat is to their advantage.
He argues that when we individually seek what is genuinely to our advantage – as opposed to what we merely believe is good for us – we at the same time enhance the being of others as well as ourselves. Like Socrates in the Republic, he suggests that there isn't really a conflict between self-interest and morality, between egoism and altruism. This is because all human beings share something deeply in common: beneath the surface of diverging and conflicting ideas, emotions, tastes, inclinations and prejudices, our true nature is constituted by reason, which must grasp the way in which everything in the universe is intimately connected.
Sometimes Spinoza has been,wrongly, identified as an egocentric and egoistic individual.He lived a secluded life.But owing to his pantheism, love of God, for him, included;love of humanity,of all men,all of Nature.The love of humanity is a background to all his thoughts, and prevents the coldness which his intellectualism might otherwise engender.
“It was through the union of the love of truth and the love of humanity, combined with an entire absence of self-seeking, that he achieved a nobility, both in life and in speculation, which has not been equaled by his predecessors or successors in the realm of philosophy” according to Bertrand Russell.
Agreeing with Spinoza’s absence of moral agency,surely tensions between societies as well as between persons should diminish,knowing the other could not have acted differently.
Not judging,not being judged,but trying to understand the causes,diminishes aggression and stress.
There is no free will,no moral agency, our brain ,independent from our will ,determines our behaviour,so there should be no moral personal judgement.Once again,nobody is responsible for the configuration of his or her brain.
“A person who sees the necessity of things,regards their passage with calm and composure.”
Stress,by the way, is one of the important causes of mental health problems.It is the relentlessness of human stress,the long term disruption of homeostasis,that increases our risk of disease,
and mental disorders.
“A growing body of evidence suggests that certain formes of depression appear to involve alterations in the way circuits in the amygdala,the hippocampus and the prefrontal cortex adapt to long term elevations of stress hormones “according to LeDoux.
Judging and permanently be judged ,is indeed stressful,for both the judge,the jury and the judged.

Chapitre 7

The elements of feeling and of thought,
And sanctifying, by such discipline,
Both pain and fear, until we recognize
A grandeur in the beatings of the heart …

William Wordsworth

I fully agree with you that it needs some sleight of hand to talk about liberty in a deterministic world where everything is caused by a cause and this one by another ad infinitum.All of this according to eternal laws we cannot escape.No free will,no control over our brain or its sensory inputs.No moral agency.Absolute determinism everywhere we turn.How can we talk of an ethical life,ethics,the title of Spinoza's magnum opus in such a deterministic world?
Does determinism then means fatalism?
Is there something,anywhere,that can liberate us,give us a feeling of liberty,even though we are determined?
Since many people think they have a free will and moral agency,they,will not feel desperate.
But for all the others,who are convinced by Spinoza's argumentation.Where can they find salvation,liberation?

There are three ways in which we can have a feeling of liberation even though we are still determined.

First of all we must try to be rational.A rational being,a reasonable being,looks for the reasons,looks for the causes for every thing.An emotion,a natural phenomenon,a piece of art,our body,any thing.

Spinoza says rationality,knowledge of things,understanding the causes,are the path to freedom.Once we have discovered the causes of a behaviour,phenomenon or drama,we will feel liberated.

The second way ,as for the adherents of stoicism,is to try to manage,understand our emotions.
We cannot avoid them.They are necessary as said Carl Jung"Without emotions it is impossible to turn darkness into light and apathy into movement "
But what we should do is,try to understand the reasons why they appeared in our brain or in the brain of others.Once we think we have found a possible reason,a cause,for them,we ,at the same time neutralize them,and free ourselves from the bondage ,the slavery,of these emotions.

Finally,the third way in which we can feel liberated is to understand and have fully assimilated,internalized,the correct
place of men in Nature and all what this implies,namely the unity of mind and body,the absence of free will,causal determinism and all its consequences.

A finite individual's power – the mind's power of thought, and the body's power of movement – fluctuate over time.,but we must always return to reason.Think again as Winston said;Go from defeat to defeat without loss of enthusiasm.
Spinoza suggests that the emotion of joy arises with the feeling of an increase in power, when we understood the causes.
The emotion of sadness arises when power is diminished,when we do not understand the causes.
Our endeavour to persist in being ,conatus,is simultaneously a pursuit of joy.Joy is not the same as happiness or pleasure.Joy is everlasting,whatever happens,it is profound,unmoved by circumstances nor events.
“The mother of debauchery is not joy but the absence of joy”wrote Nietzsche.
Joy colours all experiences.Events do not alter it.”La plus expresse marque de la sagesse, c'est une éjouissance constante.”rightly wrote Michel de Montaigne.A joyous person is resilient.
Whatever increases our understanding ,increases our power,understanding the causes,makes us happy, more powerful and leads us to value it as good .
Spinoza regards joy and sadness as the two basic emotions, and he suggests that all other emotional states are variations of these, combined with ideas of particular objects that cause them.
Damasio showed,emotions are necessary for our survival,thus confirming the conatus ,the brain assisting the rest of the body in its urge to survive.
But, make no mistake,acting blindly upon these emotions ,says Spinoza,is human bondage.
Listen to what he says at different moments;
“When a man is prey to his emotions, he is not his own master”
“There can in principle be only one way of achieving happiness,sanity and freedom.The way is to come to understand the causes of our state of mind,and the state of mind of the others.”
« Vice,if the word is to be given a meaning,is that disease state of the organism ,in which neither mind nor body functions freely and efficiently,it betrays itself as that depression of vitality which is pain.Vice and pain are connected as are virtue and pleasure.Virtue is its own reward...”
“The more we understand Nature and all what this implies,the more we will be free .”
“The greatest good is the knowledge of the union which the mind has with the whole of Nature.The more the mind knows,the better it understands its forces and the order of Nature;the more it understands its forces or strength,the better it will be able to direct itself and lay down the rules for itself; and the more it understands the order of Nature,the more easily it will be able to liberate itself from useless things;this is the whole method.”

Freedom is knowing,understanding the causes of the effect through obtaining adequate ideas,objective,scientific knowledge.
Accept the inevitability,determism,and in such a way calm your emotions and be free from the bondage of affects,passions.

Knowledge is power,joy and freedom.
Listen again ;
“We are free insofar as we follow in our thoughts the true intellectual order of ideas; the adequate knowledge of causes and thus a more complete knowledge of Nature as a whole and ourselves part of it.In so doing we necessarily cease blindly to desire,love or hate particular things.
By understanding Nature ,oneself and the others one comes to recognise that all things are necessarily the way they are. This will make us freer, as our well-being will no longer be determined by events that befall us.”

The Vedanta school of Hinduism once again has similarities with Spinozas philosophy.
This philosophy states that a human being must acquire self-knowledge to realize that one’s true self is identical with the transcendent self Brahman ,Spinoza would say Substance,Nature.
You will be the more free from the bondage of emotions, the more you look for their causes.
“The passivity of passion is human bondage,the action of reason is human liberty.Freedom is not from causal law or process ,but from partial passion or impulse;and freedom not from passion,but from uncoordinated and incompleted passion,we are free only where we know”
Humans,thanks to their special frontal lobe cortex,can decide to rationalize their emotions.
We can reason our animal instincts.
JLeDoux correctly thinks that”all emotions,including those that typically said to be basic,involve cognitive interpretation based on pattern completion of emotion schema by higher order circuits”.Wether we want it or not,our reasoning capacities are always involved in every emotion,even the basic,instinctive, ones.
I thus fully agree with JLeDoux when he writes in his excellent book “The deep history of ourselves” that “the subjective experience-the feeling- IS the emotion.These are not hardwired states programmed into subcortical circuits by natural selection,but rather cognitive evaluations of situations that affect personal wellbeing.They thus require complex cognitive processes and self awareness.”
Animals cannot have feelings of love,higher emotions,the way people have.They are missing the larger neocortex.Lucky or unlucky?Fortunately they have amigdala as we do that participate in the formation and the bodily consequences of primary emotions necessary for survival,but they do not have the constructed feelings we have through our so formidable frontal cortex .Nor do they have sufficient cortex to be able to manage these unavoidable emotions.They act upon it instantly for survival.
“No large cortex,no emotion « says
JLeDoux when he talks of our constructed feelings.
“Emotions are products of the same general cortical circuits that generate other kinds of conscious experiences.Emotions are human specializations made possible by unique capacities of our brains.They are useful traits that,because of their value,came under genetic control through natural selection.”

Emotions are the most basic form of consciousness says Susan Greenfield.It is when you have emotions,your brain is active,its synapses are flickering,you are conscious.The bigger the nervous system and its synaptic connections,the higher the consciousness.

When we ,with certainty,understand and accept that the things that are,must be and that come about must come about,will we become free.All is determined ,not contingent.Free will is an illusion.
Emotions can be either active or passive, depending on whether or not the individual is aware of them and understands,manages them,looks for the causes.
Primary emotions are the instinctive ones we share with animals,like fear and anger.Those are obviously necessary for our survival and originate in the deep brain.Fight and anger or flight and fear.Those are the ones that mostly have been studied in primates.
Secondary or constructed emotions are concocted in the human frontal cortex.For instance the fear of not being able to pay your mortgage at the end of the month.Both emotions though have the same bodily consequences;adrenaline.

« By having adequate ideas,that is,knowledge of causality,necessity,absence of free will,unity of mind,body and things,correct understanding of Substance,that is,God in everything,then we can become free insofar as we have integrated and accepted these adequate ideas."
"That thing is said to be free which exists solely from the necessity of its own nature."

There is nothing wrong seeking out pleasurable activities as long as they are motivated by adequate ideas,understanding the effects on other persons,yourself and nature,even though one cannot imagine,know or control all the consequences.Errors are human,even the best horse drops something at times.
Profound knowledge of the oneness of the universe
and we integral part of it ,assists us to be liberated from the bondage of our emotions.
Jaak Panksepp,one of the foremost neuroscientists and coiner of the term "affective neuroscience",studied the emotions in the brain and says that action and emotion go hand in hand.
He also thinks as Ledoux,that"all thinking is emotional and value-laden".He argues correctly that "the self emerges as an emotional system in order to further survival,and that it is derived from evolutionary layers of the mammalian brain.The self first emerges in the precognitive ability of most organisms to operate from an egocentric point of view of survival."
Emotions confirm the conatus since they are part of the survivalist evolution.
We thus cannot avoid emotions welling up from the deep brain,the amygdala,we have in common with animals,or in our cortex through thinking,but what bondage is ,is acting upon these without rationalizing,reasoning,them in the six layers of our neocortex,the specifically human part of the brain.That part of our human

brain that differentiates us from the rest of the animal mammal world.
The more we have understood our and other's emotions and thus digested them,the more we are liberated from them,the more we are on a different playing field than the animal instinctive world.
A neuroscientist like Judith Grisel would say; "don't let your subcortical impulses dominate your cortical regulations..."
Even though this is hard ,think again about Winston Churchill's maxim: "Success consists of going from failure to failure without loss of enthusiasm."
A rational being has not only reason,but also emotion,necessary for his or her survival,but his happiness depends on his establishing such an order in his emotions as to be led always in the path that reason advises.This can be achieved only by developing certain dispositions of character,the virtues,which lead a man to do and to feel spontaneously that which is in accordance with rational nature.Spinoza says,blessedness is not the reward of virtue,it is virtue itself.
He shared Aristotle 's view of a man as a rational being in his emotional life.
Another reason why emotions exist, from an evolutionary survival standpoint,is that the brain uses them to tag our memories.The more an emotion is strong ,the more the experience that coincided with it ,will be tagged in the synapses and thus the more it will be remembered.This function of tagging emotions in the brain's synapses is an important element in our survival as a species .This phenomenon ,neuroscientist only recently discovered.Every emotion and its experience are physically written down in our neural circuits and thus influence our behaviour.
D Eagleman writes "Experiences turn into memories when they are germane to the life of the organism,and especially when connected to a high emotional state such as fear or pleasure.This reduces the chance of overwhelming a network,because not everything gets written down."
"The formation of new memories requires the hippocampus,but the memories are not stored permanently there.Instead,it passes along the learning to parts of the cortex,which hold the memory more permanently."
Here they gain stabilization with time and deep sleep.
Eagleman says that"The changes underlying memory are distributed widely over titanic numbers of neurons ,synapses,molecules,and genes."

Damasio, elaborates and specifies Spinoza's theory on emotions ,except that Spinoza's list of primary emotions versus the secondary associatively constructed emotions is different from Damasio's. Even so, both accounts graft emotions on to what Damasio terms "innate regulatory dispositions whose function is to ensure survival of the organism." These dispositions express themselves in an " internal preference system [that] is inherently biased to avoid pain, [and] seek potential pleasure ." Moreover, "achieving survival coincides with the ultimate reduction of unpleasant body states and the attaining of homeostatic ones, i.e., functionally balanced biological states" Damasio thus has provided the neurological evidence for (and translation into contemporary scientific terms)Spinoza's theory of the emotions and the conatus as a bodily survival

mechanism.
With Spinoza's anticipation of contemporary affective neuroscience we can conclude that he was on the right track in his insistence that the conatus is the "sole basis for virtue," that is to say that the furthering of the homeodynamic stability of the self, is the source of value and the centre from which all value extends to humanity as a whole and the motor of evolution.
Emotions are as much necessary for our survival today as they were in the stone age .In the same way that primary emotions ,like fear and anger,are necessary for survival in the animal world.It is the brain assisting the conatus of the rest of the body.
Most of neurological studies on fear were done on monkeys and rats.These animals only have an embryonic cortex compared to the human cortex,but these studies produced plenty of empirical information on the emotional pathways in the brain,especially for primary emotions in the hard wired circuits by our DNA.Secondary emotions, concocted in our six layered cortex,follow much more complicated pathways,interrogating many more synaptic networks.They nevertheless are important consequences of our conatus,our desire,our survival instinct.But,again,they must be reasoned,analyzed by our large cortex in order to produce social harmony and individual blessedness,freedom.
Spinoza states that through reflection,adequate ideas and realizing our oneness with the universe we can more easily manage our emotions;
"It is only after I have investigated how my essence is determined by the universe at large that I can interiorise this knowledge and become aware in one grasp how I exist in Nature. This in combination with the self-experience of the knower produces a cosmic religious emotion. At this point the knower relates himself as a singular entity to Nature.This understanding of his place in the natural scheme of things brings to the free individual true peace of mind.Emotion, which is suffering, ceases to be suffering as soon as we form a clear and precise picture of it. "
Therefore whenever you're emotions are getting the better of you;

1 Take a deep breath,think,reason.Passive emotions are not good for your health or the health of others.
2 The "someone "cannot act otherwise,because of his DNA,upbringing and life experiences.He or she is fully determined,has no free will.
3 Look for the reasons why he acted the way he or she did towards you.If you find them,your emotion will calm down or even dissipate completely,you are liberated.
4 Look into the reasons why ,you in the first place ,became upset with him or her .Once you remember our place in Nature or once you found a cause of your emotion your will calm down.
Do not think bad of yourself but reason more next time.
5 Remember that you could not have been NOT upset with him or her.You also are determined.
6 Once you look and found the cause of his or her and/or your emotions,these emotions are at the same time neutralized.

7 If you did not find any reason,or cause,remember that your and his or her emotions couldn't have been otherwise.There definitely is a cause or causes since everything is determined .Your brain and his brain decided for you,both are determined.
8 Take another deep breath,smile and be happy that you are alive ,able to participate in life,from birth on.You ,and he or she were the champions among hundreds of millions of spermatozoa.You and he or she made it from and through the 7 meter long epididymis in the back of your fathers' gonads to your mother's female reproductive tract, swam through her cervix and into her uterus to reach the fallopian tubes .Even though that is only 18 cm,it is
the equivalent of a human being swimming 100 lengths of an Olympic swimming pool to reach a female egg first. Bingo!
9 Remember ,he ,she and you are perfect ,as everything in nature,the only imperfection is not existing.
10 Whatever happens had to happen in our fully causal ,deterministic world.
11 Listen to Paul Mc Cartney wise words and ,let it be…

Emotions are unavoidable but acting blindly upon them is not" reasonable ",in fact,the emotions they themselves ,are reasonable.They exist for our survival and evolution,they have a survival reason to exist.
Managing,reasoning the emotions is not only a young child's challenge(and its parents),it is a lifelong endeavour.

Listen to our friend;
"Not to laugh, not to lament, not to detest, but to understand."
"The highest activity a human being can attain is learning for understanding, because to understand is to be free.He alone is free who lives with free consent under the entire guidance of reason.
« The more individuals are free, the more they have things in common with other individuals and can agree with them on many things"
"Avoid the so called virtues of asceticism,act well and rejoice" said Spinoza, who was austere and simple in his life,but repudiated all the values of self sacrifice ,self denial,and still gloomier Christian attitudes as,humility,repentance and remorse.
Joy,Laetitiae,is always good because we gain power,being more fully in God,thus more joyful
and thus more virtuous,the more we participate in the divine nature.Joy is not the reward of virtue,it is just being virtuous.
Melancholy ,Tristitiae,always bad,because we diminish our power,are less in God,participate less in the divine nature.
Painful and passive emotions ,he said,are a sign of ignorance and weakness .It is these ideas that were recuperated and popularized by Nietzsche,afterwards misused and misunderstood by Nazism .
Happiness of the free man in the free exercise of his understanding,is essentially uncompetitive,peaceful and respectful of law and order.Persons,governed by passive emotions threaten self preservation ,self advancement and society.

Emotions define who we are,since our experiences are recorded ,tagged ,with their corresponding emotions,in the synapses of our brains,as we saw.The only way then in which we,as an individual and as a society,can ,indirectly ,influence our brains' decision making is to incorporate virtuous ideas in our neural networks,especially through moral education.

It is life experiences that define the brain.Unfortunately they are not our decisions,they come to us,completely out of our control.Therefore education in science as well as moral education are the crucial life experiences instilling adequate synaptic circuits in the brain.
As a society we have that power and freedom,unfortunately,not as an individual.We cannot decide the life experiences we want,only society can influence them partly.

"Instead of loving something finite ,we must love everything as that what is eternal and infinite."
Spinoza would say loving God is loving life as it is.
"The best life is necessarily the happiest."

Certainly such a philosophy will change our present day human centred and destructive attitude towards Nature as well as the sometimes warlike attitude towards civilizations with different histories and values.
When i see Louis Armstrong sing « What a wonderful world « with his creaking voice and fantastic smile ,or when I watch Karolina Protsenko play the same song or hallelujah on her violin in the streets of Santa Monica,you cannot but feel the power of rejoice in human life.
Beethoven,old and nearly deaf,writes the Ode to joy in his last symphony .Bach startled churchgoers as he wrote and played the "Joy of Man's Desiring" even though he had lost two of his children and came out of a depression that same year.Also he wrote the cantate "Jesus que ma joie demeure".
Rejoicing in life is powerful and positve.
Even death should not kill it.
"neither do we rejoice therein,because we control our lusts,but,contrariwise,because we rejoice therein,we are able to control our lusts."
Spinoza often wrote with disgust and contempt of the appeal of some conventional religious morality to supernatural rewards and punishments,as being appeals essentially squalid and unworthy of adult intelligence.
Nietzsche thought,as many before him,that killing our traditional god would undermine morality and open the way to chaos and debauch.
The more secular society we presently experience,is a living proof that such doomsayers were dead wrong.Finally what we need is a society of secular saints bound together by "the love which acknowledges as its cause,freedom of mind"
But,the human condition being always imperfection,we unfortunately still need human law ,which,for perfectly wise men would be unnecessary,said Spinoza.
For a group of people to function properly,rules are necessary.Sanford Kaddish

as a law professor said »
When we blame a person ,finally we should instead blame his DNA and or his nurturing,his life experiences,as these are the defining causes of his behaviour,burned ,written into his synaptic connections.No person is responsible for the configuration of his brain.No one is.If we blame a person,then better we should blame also all the causes which led to this persons' actions ad infinitum.Finally we should then blame society as a whole,this one and previous ones.
When the brain is correctly wired,for instance,thou shall not kill, written in the brains'networks,these thoughts,values,will be part of the synapses firing and calculating,influencing the behavioural outcome.
Nature and its determinism on the one hand and nurturing and education on the other hand define the outcome of behaviour,as both are printed in our synapses and their networks.

Chapitre 8

Sweet is the lore which Nature brings;
Our meddling intellect
Mis-shapes the beauteous forms of things:
We murder to dissect.

William Wordsworth

We are living through one of the greatest of scientific endeavours – the attempt to understand the most complex matter in the universe, the brain. Scientists are accumulating vast amounts of data about structure and function in a huge array of brains, from the tiniest to our own. Tens of thousands of researchers are devoting massive amounts of time and energy to thinking about what brains do, and astonishing new technology is enabling us to both describe and manipulate that activity.Their revelations are more dazzling than lady Gaga. Spinoza always said that by acquiring knowledge of the second kind,scientific knowledge,we will come to understand the correct place of man in Nature. Therefore it is important that we acquire scientific understanding of the workings of the human brain.

Most people don't yet understand the full meaning of what we are seeing in the neurosciences,but we must know it means the beginning of a new age.It points to a unification,rather than a contradiction ,of what psychologists,anthropologists,linguists and yes,philosophers,have been saying all along.
Suddenly the world has gone from flat to round.
More and more we understand that,to study behaviour,we must begin by studying the organ behind it.Biological determinism,in recent years,has begun to erode our confidence in our knowledge of what is and what is not an issue of morality.
As observed by Francis Crick, the co-discoverer of the DNA double helix, the brain is an integrated, evolved structure with different bits of it appearing at different moments in evolution and adapted to solve different problems .It has grown fourfold in size in the last 3 million years.
The human brain contains 86 billion neurones,give or take a few billion.There are hundreds of different types of neurones and many thousands of subtypes.Each has its own specific morphology,biochemistry,electrical properties and patterns of connectivity with other cell types,neurones or muscle .
A single neuron may easily be connected to 10,000 others. Some,in the frontal cortex,are connected to 100,000.
Each individual neuron can form thousands of synapses,links with other neurons,giving a typical brain well over 1000 trillion synapses ,processing information.This by some estimates is equivalent to a computer with a one trillion bit per second processor.This also means that the theoretical number of possible different patterns of connections in our brain is approximately forty quadrillion,40

with 15 zeros behind.A number greater than the number of atoms in the universe.
We know around 100 different neurotransmitters that influence neural connectivity.
Neurons conduct signals by means of charged particles; sodium,calcium,potassium and chloride ions,through ion channels.
In the cortex,the densest part of our brain,one cubic millimetre,the size of a grain of sand,the quantity that fits under your nail,contains tens of thousands of neurons,a billion of synapses and four kilometres of connections,according to Patricia S Churchland,a neurophilosopher at UC,San Diego.
There are few physical things in the observable universe remotely as numerous as the possible connections in the brain .Even the possibilities inherent in a 400-amino-acid protein do not come close.
The brain is conscious of itself,alive,adapting,learning ,plastic and evolving .
It also,astonishingly,comes into the world largely like a tabula rasa.
In 2014, some clever researchers in Japan tried to match the processing power of one second from one percent of the brain. That doesn't sound like very much, and yet it took the then 4th fastest supercomputer in the world (the K Computer) 40 minutes to crunch the calculations for a single second of 1% of brain activity..
Nature can store 215 petabytes of data in one gram of DNA ,that is ten million times better than the best hard discs can manage today,but nothing comparable to the brain's memory capacity.
All of our brains have the same general features that make us human,but each neural connection ,each synapse ,is unique,reflecting a persons special genetic endowment and as we tiresomely reiterated ,his life experiences.
Neurons are always communicating in the background,a physical system that is always in a ready state.As time passes and the body moves,this conscious brain,or mind,experiences the world,adding and deleting information,updating and revising maps.More so when we sleep.

More and more science tells us sleep is critical for good health. It helps us form memories and solve problems, allows tissue growth and repair, promotes metabolic health and removes toxins from the brain, including amyloid beta which is linked to Alzheimer's disease. Insufficient and disrupted sleep is now known to result in altered emotional responses such as irritability, anxiety, loss of empathy, impulsivity and a reduced sense of humour. Cognitive performance also takes a hit, leading to a loss of attention, concentration, communication, decision making, creativity, and the ability to multitask. Finally, poor sleep affects physiological health, leading to an increased risk of stroke, heart attack, infection, cancer, obesity, type 2 diabetes and mental illness.
As I said when we sleep,the brain doesn't.
It uses its low activity to get rid of its metabolic waste.Since there are no lymphoma or lymphatic systems inside the brain even though it uses 20% of our energy.Where do these waste products go?Only recently we discovered that the brain has an ingenious system ,that ,when we sleep,it discards these biological waste.Therefore we need enough quality sleep to have clear thoughts. Most of the body's waste disposal is done by the lymphatic system, which clears

damaged or misplaced molecules and pathogens from tissue and transports them to the blood, where they are broken down by the liver and excreted. But the traffic across delicate brain tissue is regulated by the blood-brain barrier, which does not allow the lymph to clean up in the way it does elsewhere in the body.
Only a few years ago,neuroscientists,discovered that the brain flushes out its waste via what they describe as a “second set of pipes”. This “glymphatic (glial and lymphatic)system is made out of glial cells – sometimes called the “glue of the nervous system” because one of their primary functions is to help hold neurons in place. The glial cells form tubes around blood vessels in the brain. Special fluid flows in the space between the glial cells and the blood vessel and sweeps protein build-ups away from brain tissue, where they could have caused diseases like Alzheimer or Parkinson.
The reason for the increased flow during sleep,the researchers suggest, could be that the glial cells shrink away from the blood vessels during sleep. This leads to a 60 per cent increase in volume between the outer glymphatic pipes and the inner blood vessels, letting more fluid pass through the brain.
Further testing showed that beta amyloid protein – which is associated with Alzheimer’s when it clumps together in the brain to form plaques – was cleared twice as rapidly from the brains of sleeping mice compared with mice that were kept awake.
This is very important because I don’t think people have been thinking of how the sleep-wake cycle might influence a process of neuro degeneration,says David Holtzman, a neuroscientist and Alzheimer’s researcher at Washington University in St Louis, Missouri.
This work emphasises how we might want to think about our normal habits, even sleep, predispose us to certain problems later in life.
Quality sleep makes quality brain.
No sleep or bad sleep creates brain problems.
Caffeine does not promote quality sleep,since it stays 24 hours in the blood.Half of the caffeine you took in your morning cup still is in the blood when you go to bed.This tiny organic molecule,trimethylxanthine,reaches virtually every cell in your body and increases the rate at which its neurons fire all over your nervous system,brain and peripheral system.
At high doses caffeine is lethal to insects.
Even though a doctor once argued with me that it is not detrimental to humans physical health,what is certain is,that it is detrimental to their sleep.
Matt Walker , a UC Berkeley neuroscientist and deep sleep researcher,in his 2017 book « Why we sleep »
states that we are not getting enough sleep,and,more importantly that our sleep quality stinks…The principal culprit is caffeine.He also suggests that it may be a key factor in the development of,Alzheimer’s,arteriosclerosis,stroke,heart failure,depression,anxiety,suicide and obesity
diseases that have gone up,parallel to caffeine consumption.
Poor sleep affects physiological health, leading to an increased risk of stroke, heart attack, infection, cancer, obesity, type 2 diabetes and mental illness.
As Michael Pollan quotes Walter in his book « This is your mind on plants »,low

frequency brain waves from the frontal cortex travel toward the back of the brain,during deep sleep,synchronizing thousands of brain cells into a neural symphony,transporting our daily memories to more permanent locations and thus make us learn from our life experiences.
Think about this next time you enjoy a double espresso , bien tassé,at your Starbucks.

But let us get back to our brain and stop sleeping.

There was an evolution over time of the human brain .
The first brain structure appeared in life at least 521 million years ago.
Neurons evolved as specialized cells to transmit orders or information,more efficiently and rapidly between the sensory and the motor cells.The ability to transmit electrical signs existed even before more complex multicellular life forms.
The modern human brain stills contains the primitive hindbrain region,the “protoreptilian “brain.This paleomammilian brain contains hippocampus and amigdalas in the “deep”brain,the limbic system.This deals with the “primitive” functions;emotional,sexual and fight and flight behaviours.
The cerebrum ,that regulates the higher cognitive functions ,language,thinking,information processing,developed only 200 million years ago.
Still later evolved the neocortex,neo meaning new,the most evolutionary and youngest part of the brain,only present in mammals.
This neocortex is ,by far ,most prominent only in humans.It is the location of most higher level functioning and cognitive abilities.In humans this part of the brain represents 76% of the total.This part is what makes the mammal a Homo Sapiens.Apart from humans the mammals with the largest cortexes are the primates and dolphins,living in hierarchically organized cooperative structures.Dolphins,just like humans,exhibit both preference and avoidance behaviour.They cluster into groups of associated animals,or communities.Two ,thirty ,even hundreds of animals.They may not be on Facebook but associate with the friends they like and communicate through whistles.They depend on the group for hunting,mating and defending.These open associations require a lot of brain capacity to enable harmonious cooperation.They seem to show emphatic,cooperative and altruistic behaviour.
David Bjorklund ,as evolutionary psychology professor, thinks the neocortex increased in size in our early ancestors,as they lived in bigger and bigger group sizes ,necessitating greater cooperation and a greater urge to regulate competition.This growth in the size of the neocortex permitted a better voluntary inhibitory control of social behaviours,resulting in increased social harmony and better hunting capabilities.
Steven Johnson writes”The sophistication of our mindreading skills is part of our heritage as social primates;our biology contains cheat sheets for building theories about our minds because our brains evolved-and continue to evolve-in complex social environments ,where being able to outfox or cooperate with your fellow humans was essential to survival....It turns out that one of the greatest

evolutionary achievements is its ability to model the mental events occurring in other brains."
There was a permanent trade off between bigger brains and thus better cooperation on the one hand and the higher demand of energy for the bigger brain on the other hand.
The fact that we as humans are a very social animal created and made possible this extraordinary complex computational capacity of the human brain .
The months of confinement during the Coronavirus episode ,have clearly shown how much we yearn for social connection,that we are fundamentally a social animal.Humans need connection - we exist in a network of reciprocal relationships,that are since the Stone Age written in our synaptic networks.As we saw,the social networking and quest for harmony made it necessary to increase the size of our brain on the one hand and permitted the satisfaction of the bigger energy to feed it on the other hand.Solitary confinement therefore is a form of torture that can swiftly drive people mad: locked into the cell of the self, the world does not reach them and they cannot reach out into the world. Words need to be heard, pain recognised, joy shared. Loneliness is hazardous.
The penny has also dropped in the same period that wellbeing isn't individual but social. We are not independent at all, but dependent. We can make each other sick and we can try to make each other well.It has been fascinating to see the speed at which some attitudes have changed during the pandemic .The indignation expressed towards people not respecting social distancing ,or anti vaccine (from those who would never normally describe themselves as moralists) has been understandably shrill: here too we've suddenly realised that the wellbeing of the group is endangered by indifferent individuals, and that community – for which we've yearned for so long – means originally simply a pooling of duties.
Grabby selfish ,individualistic , materialistic societies ,even rich,saw the most deaths and devastation,because they were not organized to assist the most vulnerable.
Recent studies confirmed that the more there is inequality in a society,the more there were COVID deaths.

But let's once again get back to our brain.

There is a chronological hierarchy in the different parts of the brain's layers .The cortex has six physically distinct layers.
Information comes into the brain through the senses(I smell French fries),thought(I love French fries),senses input((I feel hungry),decision making((Am I going to get some),I will feel bad with junk food(memory),reasoning(just a small quantity),action(I go for it).
The six layers have different hierarchy and chronology but are extremely highly interconnected.The higher the hierarchical level,the higher the cognitive capacities,and also the higher the connectivity,that is the number of synaptic connections in the networks.
At the lowest level of monitoring,the brain stem maintains our vigilance,our

general degree of arousal.At the next level,the brain's motor centers allow us to physically reorient our bodies so that we can immediately redirect our senses to possibly new vilains or food sources.Then the lambic system accomplishes both novelty detection and reward.Finally,the cerebral cortex is part of our mammalian heritage,bit compared to other mammals or even primates,but what distinguishes us most ,is the area of the prefrontal cortex.In humans it is bigger but, more importantly, with a daunting connectivity inside and between prefrontal,parietal and temporal areas .The prefrontal cortex itself has the highest connectivity compared to the other parts of the brain.Therefore Todd Preuss described it as "rewired and running hot".It is the number of connections,synapses,in the brain,that defines cognitive capacity ,not the number of neurons.As we saw,one neuron can have 100000 synapses in that region of the brain.
An elephant has more neurons then we do and has a bigger brain,but less cognitive capabilities than we do.The Increased connectivity is what distinguishes us most from other primates.Our reptile brain,the cerebellum has four times more neurones than your cortex.
Part of our brain,or nervous system ,medical books say ,is autonomous ,acting automatically without "our" free will and another part is said to be under "our"control,non autonomic.
I guess that Spinoza would argue that the whole of our nervous system is autonomic,including the part in our skull,the brain…

Better brainy cooperation between humans provided the supplemental energy necessary for this bigger brain .It uses 25% of our total energy,though representing only 2% of our total weight .
Let us admit,we do not know why it exploded in size and complexity in the last thousands of millennia,but I think that cooperation in ever larger groups is a major reason.
The male brain is bigger than the female brain,but do not come to quick conclusions,as we said,the elephant brain is bigger than the human brain...Density and neural interconnectedness ,the quantity of synapses and dentrites,the quantity of myelinated axons and many other elements are equally important ,if not more,than size or the number of neurons.
Globalization ,as we unfortunately see daily ,through the exponentially increased physical and virtual communication ,apparently always is one step ahead of our neocortexes ability to manage social harmony,inclusiveness,diversity.

« Descartes was impressed by the hydraulic figures in the royal gardens, and developed a hydraulic theory of the action of the brain," Lashley wrote. We have since had telephone theories, electrical field theories and now theories based on computing machines,algorithms,quantum theory and automatic rudders. I think we are more likely to find out about how the brain works by studying the brain itself, and the phenomena of behaviour, than by indulging in far-fetched physical

analogies.
In principle, it must be possible, because the working hypothesis is that mind is a product of matter, as Spinoza always argued,that we should therefore be able to mimic the brain in a device. But the scale of complexity of even the simplest brains dwarfs any machine we can currently envisage or even dream of.For decades – centuries – to come, the singularity will be the stuff of science fiction, not neuroscience.
Even something as apparently straightforward as working out the storage capacity of our brain falls apart when it is attempted. Such calculations are fraught with conceptual and practical difficulties. Brains are naturally evolved and evolving phenomena, not digital devices. Although it is often argued that particular functions are tightly localised in the brain, as they are in a machine, this certainty has been repeatedly challenged by new neuroanatomical discoveries of unsuspected connections between brain regions, or amazing examples of plasticity, metaplasticity,in which people can function normally without bits of the brain that are supposedly devoted to particular behaviours.
On the other hand neuro plasticity has its limits.
Connections for a function in the baby brain are extremely receptive to input .As we said,our brain comes into the world like a clean slate.There is critical period,windows of opportunity.Once the window closes neural connections are pruned down to the most efficient,according to how much they are used.Then the battle is over.When an eye lid of a baby stayed close for too long during this critical period ,that eye once reopened,will never be able to see.
If for some reason a child never moved his arms ,these circuits would be lost and he would never be able to move his arms in a natural way.
Darwinism is at work between neurons,dendrites and synapses.
A neuron is not like a binary switch that can be turned on or off, forming a wiring diagram. Instead, neurons respond in an analogue way, changing their activity in response to changes in stimulation,life experiences.The nervous system alters its working by changes in the patterns of activation in networks of cells composed of large numbers of units; it is these networks that channel, shift and shunt activity. Unlike any device we have yet envisaged, the nodes of these networks are not stable points like transistors or valves, but sets of neurons ,synapses,hundreds, thousands, tens of thousands,trillions strong – that can respond consistently as a network over time, even if the component cells show
« inconsistant « behaviour.Understanding even the simplest of such networks is currently beyond our grasp and will probably always be.
Nevertheless we know now for certain that life experiences define physically the brain,as much as DNA does.
Some people talk of the brain’s emergence,we already talked about in the chapter of mind body.
The property of a system is said to be emergent if it is a new outcome of some other properties of the system and their interaction, while it is itself different from them.Emergent properties are not identical with, reducible to, or deducible from the other properties of its parts.The different ways in which this independence requirement can be satisfied leads to variant types of emergence.

But let’s be clear once again,there is not a new reality showing up because we cannot predict events.
It is not that because we cannot predict future outcomes,because there are too many variables ,that causality and determinism doesn’t exist anymore in complex systems ,like weather forecasts or the brain’s firing neurones.
We are only finite humans as Spinoza would say.
If we could put absolutely all causes in mathematical equations we would be God,infinite.We could perfectly explain the past and perfectly predict the future.
No new qualities appear in the brain because we cannot predict,as some emergence adepts claim.This is again ,in my view,looking for a free will and moral agency in far fetched places.There is not suddenly a free will ,or moral agency,emerging because it is impossible to predict the firing of neurones and thus the outcome,our behaviour.It is not that because we cannot predict events in quantum mechanics that determinism is to be immediately abandoned.It is not because WE did not find a pattern for the movements in quantum mechanics that there is no determinism,that it is random.
We cannot measure the influence or put in an equation the influence of the flapping of a butterflys’wings on the weather in Texas that there is none.
In the same way,it is not because we cannot in any way predict the outcome of the trillions of synaptic flickering in the brain ,or understand the causal relationship,and thus our behaviour,that the mind ,our brain would be a randomly behavioural phenomenon,non determined.
Our brain is a causal machine submitted to the laws of Nature,fully determined from the Big Bang on.
The only thing I see « emerging « out of the brain are our thoughts and behaviour but not a free will.
Everything influences everything in a causally determined relationship along the laws of nature.We are one in causation,and each of us is a link in this causal chain. There are few things in nature as intrinsically ,physically linked as the neurons in the brain through the trillions of its synapses,axons,dentrites.But thanks to this highly concentrated phenomenal connectivity high consciousness results closely linked ,integrated with the senses.
Some people do not like to be told there is no free will and will struggle ,like a devil in a holy water stoup,to find one in far away corners.
We nevertheless agree with M S Gazzaniga that we will never learn the tango if we will only study the neurons.This clearly is the challenge for the future neuroscientists must study the brain’s functioning in real time.But then again we probably will never be able to accurately predict the outcome of the trillions of trillions of interconnected neurones’ firing synapses and thus behaviour.The same way that we will only be approximately be able to forecast the weather in the future.
Understanding even the simplest of neural networks is currently beyond our grasp. Eve Marder, a neuroscientist at Brandeis University, has spent much of her career trying to understand how a few dozen neurons,in the lobster’s stomach,produce a rhythmic grinding. Despite vast amounts of effort and ingenuity, we still cannot predict the effect of changing one component in this tiny

network that is not even a simple brain.
We study the retina,the photoreceptors,its rods and cones,the optic nerves,the optical pathway,the primary visual cortex, the region in the brain that activates when we see,but we do not understand how the brain can see.The picture is recorded into electro chemical impulses transported to other regions in the brain,but how can the brain see?
This is the great problem we have to solve;
On the one hand, brains are made of neurons and other cells, which interact together in networks, the activity of which is influenced not only by synaptic activity, but also by various factors such as neuromodulators. On this we found out a lot.
But on the other hand, it is clear that brain function involves complex dynamic patterns of neuronal activity working and firing together in groups,networks linked astonishingly intricate together through axons ,dendrites and synapses,myelinated or not.
Finding the link beween these two levels of analysis will be a challenge for much of the rest of the century and centuries to come.As a matter of fact we cannot in detail observe the whole of the brain in action.As we said earlier,few things are as much interconnected as the neurons in the brain.When scannners observe the brain when we listen to our favourite music,it is as if the whole brain lights up at once.But when one plays an instrument,the brain undergoes a real workout,still more brain regions light up.
The human brain is an organ different from a heart or a liver.Not only can we hardly take it out of a skull and analyze the firing of the synapses while it is alive,the complexity of its dynamics are beyond our grasp.
Accurate identification of network structure requires a large amount of multi-channel neuronal pulse response data with a high temporal and spatial resolution. However, the data quality obtained by the existing measurement methods, such as Electroencephalography (EEG), Magnetoencephalography (MEG), functional Near-infrared Spectroscopy (fNIRS), functional Magnetic Resonance Imaging (fMRI), and Invasive Electrode Implantation (IEI), are usually limited because of a low temporal and spatial resolution.
Neurons do not react like billiard balls,the soma of the neurons have a complicated way of deciding to transmit impulses,yes or no,how strong,to which other synapses.
Marvin Chun proposes that neuroscientists and Artificial Intelligence specialists should work together on FRMI to advance our knowledge on brain scans in real time.He already has amazing discoveries doing so.
Maybe one day some radical new approach integrating physiology , biochemistry, anatomy ,new sciences or instruments,more sophisticated and powerful computers than the ones we presently possess,will shed more light on what is going on in our mind on the synaptic level in real time.
But ,do not despair,with what we know today,we are certainly much better equipped to philosophize on the topics of free
will and mind -body ,than Spinoza was in his days,when he wrote”For no one has acquired such accurate knowledge of the fabric of the body,as to be able to

explain all its functions;nor need I omit to mention the many things observed in brutes,which far surpass human sagacity,and the many things which sleepwalkers do,which they dare to do when awake;this is sufficient to show that the body itself,merely from the laws of its nature alone,can do many things,at which the mind marvels."
This means that he was convinced that our behaviour,our mind ,our brain,must be explained in physical terms.
Most neuroscientists,come to the same conclusions as he did nearly 400 years ago but not thanks to what he called the third way of knowing:intuition,but rather through painstakingly little scientific advancements,one little step at the time,the second way of knowing.
The brain is the best piece of work,that we know of today,accomplished by Substance,evolution,through the laws of Nature,on matter.
Substance,Spinoza said is the mind of God at work in matter.
Some intelligent people are convinced that we will be able to mimic the human brain in an immensely giant computer in the future.
Artificial brains are man-made machines that are just as intelligent, creative, and self-aware as humans,they say.
No such machine has yet been built, but it is only a matter of time.,given current trends in neuroscience, computing, and nanotechnology, it is likely that artificial general intelligence will emerge sometime in the 21st century, possibly even in the 2030s…
There are two broad approaches to achieving this goal:
Conducting large-scale, biologically-realistic, human brain simulations within currently available supercomputers.
The building of novel, massively-parallel, neuromorphic computing devices that are closely modeled on neural tissue.
By "reverse engineering"the human brain we will come to understand it. By reconstructing and enhancing the brain we will be empowered to push forward our understanding of the universe and to evolve life to the next level…
Even if we could realize one day this super supercomputer,which I seriously doubt,I think it would miss the substance ingredient,to progress in time by itself through the millions of years,even with the trillions and trillions of data input and crunching.

Chapitre 9

Nor less I deem that there are powers,
Which of themselves our minds impress,
That we can feed this mind of ours,
In a wise passiveness.

William Wordsworth

The plasticity of the brain is a vast subject,becoming vaster every year.
Plasticity is present between regions of the brain.
On the neural level there is Darwinian competition.Axons can grow,disappear,and regrow.Dendrites also grow on the axons in the brain and can multiply on these axons.
Myelination and demyelination occur throughout our lives.Synapses weaken or strengthen as they are used,and neurotransmitters influence the electric impulses between synapses.Even down on the level of the DNA in the neurons there can be change.
All of this plasticity is caused by external factors outside of our personal control and certainly outside our awareness.
We see thus that comparing the brain to an hardwired computer is absurd,not only because of it's plasticity but as much as for its extraordinary "computational " capacities that dwarf our largest computers.
We can't even imagine a machine being able in the future to match the brain's complexity ,flexibility and plasticity.
The same brain has a different plasticity,when it is in the womb,new born,child,adolescent or an old age individual.
Therefore we can only talk on the subject insofar as necessary to document its philosophical implications or consequences.

Bryan Kolband and Robbin Gibb, did an overview of the subject of the brains plasticity in the literature and found that brain development progresses through a series of stages beginning in the womb,with neurogenesis and progressing in the new born,to neural migration, maturation, synaptogenesis, pruning, and myelin formation .
Eight basic principles of brain plasticity are identified .Evidence that brain development and function is influenced by different environmental events such as sensory stimuli, psychoactive drugs, gonadal hormones, parental-child relationships, peer relationships, early stress, intestinal flora, and diet.They concluded that the development of the brain reflects more than the simple unfolding of a genetic blueprint but rather reflects a complex dance of genetic AND experiential factors that shape the emerging brain.
As for the genetic aspect J Mitchell put numbers on heritability estimates for the different parts of the brain;
72%for Gray matter volume
85%for white matter volume

82% for total brain volume
Other parts of the brain 60% to 80%
Thickness of cortex 50% to 70%
Connectivity of networks 60% to 70%
Remember the title of his book;Innate…
These % mean that across in a population,
at a given time,the variance(the deviation of individuals from the mean value of the trait) is due to genetic differences.
The age of the brain must be an important differentiation in the level of its overall plasticity.
Our genes have a big effect on how our brains are wired,very literally.
The genetic program of brain development (also) entails all the growth and maturation that occurs after birth,exactly as for other parts of the body. »and « genetic differences contribute to differences in behavioural traits « .Up to the age of about 25.
Our brains are come prewired,but they are not hardwired,says Mitchell;
»Anything that we have learned has a physical substrate somewhere in the brain- a change in synaptic connections between some neurons,which will alter our response to the relevant stimulus or situation when we encounter again. »
Our brains come unfinished,life experiences complete it permanently.

Most neurogenesis is complete by five months in the womb,with one important exception being cells in the hippocampus, which continue to form neurons throughout life. There are about ten billion cells needed to form the human cerebral cortex in each hemisphere. These cells are formed rapidly and it is estimated that at its peak, there are about 250,000 neurons formed per minute. It is obvious that any brain perturbation at this time in a babies' conditions have significant consequences.
Dendritic growth is slow, on the order of micrometers per day. Axons grow about 1000 times faster, namely about one mm per day. This differential growth rate is important because the faster growing axons can contact target cells before the dendrites of that cell are completely formed. As a result, axons can influence dendritic differentiation and the formation of cerebral circuits.
Synapse formation in the human cerebral cortex poses a formidable challenge, with a total of more than 1000 trillion .This enormous number could not possibly be determined by a genetic program, but rather only the general outlines of neural connections in the brain can be genetically predetermined. The vast array of synapses is thus guided into place by a variety of environmental cues and signals ,as well as by the genetics.The manipulation of different types of cues and signals produce dramatic differences in cerebral circuitry.
The discrepancies in brain modifications after adulthood is increasingly driven by lifestyle and life experiences.
Nature and nurture are both at work in the synapses' links,especially in the cortex from before birth on,in the womb.
The first few years of a child's life are a time of rapid brain growth. At birth, every neuron in the cerebral cortex has an estimated 2,500 synapses; by the age of

three, this number has grown to a whopping 15,000 synapses per neuron.
The average adult, however, has about half that number of synapses. Why? Because as we gain new experiences, some connections are strengthened while others are eliminated. This process is known as synaptic pruning,or neural Darwinism.
Thus the peak of synapse formation is between one and two years, depending upon the region of cortex. Just like a sculptor who creates a statue with a block of stone and a chisel to remove the unwanted pieces, the brain has a parallel system in which unneeded cells and connections are removed by cell death and synaptic pruning. The metaphorical chisels in the brain can be of many forms, including some type of epigenetic signal, a wide range of experiences, gonadal hormones, and stress etc.
Brain development, in the embryo,is composed of a cascade of events beginning with mitosis and ending with myelin formation. The effect of brain perturbations and experiences will therefore vary with the precise stage of brain development. We should not be surprised, for example, that experiences and perturbations during mitosis would have quite different effects than similar events during synaptogenesis or later during pruning. Experiences are essentially acting on very different brains at different stages of its development.
Of course the baby brain is a tumultuous changing brain,but the brain also changes as our life goes by up to its end.

When Merzenich set up his laboratory in San Francisco in the early 1980s,virtually everyone believed that brain plasticity was for kids only.He did not and made bets that adult brains also could undergo profound changes.It was quite the dust-up
when he performed a now classic experiment in which he took an adult monkey,temporarily sewed together two of its fingers and two weeks later took a look at the hand representation in its brain.Where there had been distinct maps for its index and middle fingers,now there was one single finger map for both fingers.Two fingers had been fused in one in his brain as they were in reality.After the sutures were removed,a few weeks went by,the sewn finger map split itself back in two separate finger maps.Merzenich won the wager.
Two features of brain development are especially important for understanding how experiences can modify cortical organization,maps,synaptic networks according to Bryan Kolband and Robbin Gibb.
First, the cells lining the subventricular zone are stem cells that remain active throughout life. These stem cells can produce neural or glial progenitor cells that can migrate into the cerebral white or gray matter, even in adulthood. These cells can remain quiescent in these locations for extended periods but can be activated to produce either neurons and/or glia. The role of these cells is poorly understood at present but they likely form the basis of at least one form of postnatal neurogenesis.
The second special feature is that dendrites and spines show remarkable plasticity in response to experience and can form synapses in hours and possibly even minutes after some experiences.

The brain continues to form, strengthen or weaken synapses throughout the lifetime ,registering all of our experiences.
Neuroscientists today believe that the ongoing plasticity of the connections is a fundamental feature of memory storage for animals living in a dynamic and stimulating environment like Homo sapiens.
These synapses are the groundwork and define learning ,memory and of course ,behaviour.
Finally the neural cell is the underlying support structure for the real actors,which are the dentrites and still more importantly,the synapses.
Later in life,synapse formation is more focal and localized to regions involved in processing specific experiences. These synapses are called "experience-dependent." One curious aspect of experience-dependent effects on synapses is that not only do specific experiences lead to selective synapse formation but also to selective synaptic loss.
In neuroscientists jargon this is called Long-term potentiation (LTP) ,the persistent increase in synaptic strength following high-frequency stimulation of a chemical synapse.This term long-term potentiation comes from the fact that this increase in synaptic strength, or potentiation, lasts a very long time compared to other processes that affect synaptic strength.
The opposite of LTP is long-term depression LTD which produces a long-lasting decrease in synaptic strength .Consequently the neural networks are constantly rewired as a consequence of life experiences.
Robert Malenka, a prominent LTP researcher, has suggested that LTP may even occur at ALL excitatory synapses in the mammalian brain.
Thus, experiences are changing neural networks by both adding,pruning, strengthening and loosening synapses.
Michael Merzenich has been considered the world's leading researcher on brain plasticity.He argues that "Thinking,learning,and acting actually change both the brain's physical structure(anatomy) and functional organization (physiology)from top to bottom."
Science is telling us two things,says Steven Johnson"our brains are designed to capture the
idiosyncrasies of our lives,and those lives-our memories of them-are being rewritten with each passing day"and that,"specific memories transform us as we grow and develop,the way life experiences wire our brains as meticulously as our genes do".
"The brain,learns and stores many things in networks that function outside of our conscious awareness.These learned tendencies affect all aspects of our mind and our behaviour,and are probably at least as important for day to day functioning as what we know about ourselves conscientiously"according to Joseph LeDoux.
Therefore we cannot agree with Stuart Hampshire when he writes"The activity of thought is matched by an activity of the brain which is comparatively free from external inputs".All our experiences are written down in the synapses and are part of the elaborations of thought,even when we think alone in a dark room.It is wrong to think that as he does that "The mind spirals upwards,as it were,from its

own attachment to a particular body in the exercise of pure intellect,when the thought has no local reference to transient things".
There is no spiralling up or down between body and mind,they are one.It is impossible to escape from the past in the brain.
Over the past 20 years the neurosciences have made clear that even fairly innocuous-looking experiences can profoundly affect brain development and that the range of experiences that can alter brain development is much larger than had been once believed.Experiences are not singular events but rather,as we go through life, experiences interact to alter the synapses, the synaptic strength,our neural circuits and thus,in the end,our behaviour.This process is referred to as metaplasticity.Everything that happens to you happens to your brain.
The brain's maps are not fully genetically pre-scripted but moulded by its input in life.
"We are dropped in the world with a half-baked brain"writes David Eagleman,a young neuroscientist in his book Livewired,and" this has proven a winning strategy for humans."Because we are not as hard wired as most animals,because we have a more adaptable brain to the environment,we have conquered more different environments."
Humand occupy more ecological niches than any other species on the planet.
Even though there are 3bn pairs of nucleotide bases that make up human DNA ,they are no match for the trillions of synapses in the brain.Therefore I would break bread with him when he says that "the DNA cannot provide the whole story for humans.The brains organization is too complex ,and the genes are far too few;the number of neurons and their connections vastly outstrips the number of genetic combinations"
This plasticity is most present in our formidable cortex that we are the only mammals to possess.The rest of our " animal"brain has less plasticity,is more hardwired,preprogrammed.
Eagleman states that;
"Thus,for humans at birth,the brain is remarkably unfinished,and interaction with the world is necessary to complete it."
"Our DNA is not a blueprint,it is merely the first domino that kicks of the show"
"The pattern of inputs determines the fate of the cortex.The brain dynamically wires itself to best represent (and eventually act upon) whatever data come swimming in"
He is right as he says,that there is a " chronic and unforgiving competition for brain real estate",if there is no input from one of the senses ,that sense organ looses its territory in the brain,and is overtaken by another sense or senses to obtain a higher definition.That is why he thinks we dream,and see things our eyes closed,so that the visual system in the brain,the occipital cortex stays active at night so that that part of the brain is not overtaken by neighbouring sense areas.Thus he states that
"visual dreams are a by product of neural competition and the rotation of the planet "
Experiences,from in the womb until death,define physically our brain .
Rusty Gage,a professor in Salk's Laboratory of Genetics says that "We are

taught that our DNA is something stable and unchanging which makes us who we are, but in reality it’s much more dynamic,It turns out there are genes in your cells that are capable of copying themselves and moving around, which means that, in some ways, your DNA does change.”This is called epigenetics.
Tracy Bedrosian, a former Salk research associate and first author of the study states that”Maybe there are factors in the brain or in the environment that cause changes to happen more or less frequently.”So even our DNA is influenced by life experiences especially in young age.
As life goes on our brain includes the moral values we accept and integrate as ours along the way,through education or deducted from all our life encounters. These values and ideas, printed in our brains are integrated in the neural processing that determine action,behaviour.
“Morality is an extremely important defining factor for humans. It defines or contributes to people's choices or actions.Moral decisions, like other neural processes ,have a clear biological basis”according to J LeDoux.
How does morality work in the brain? A functional and structural perspective of moral behaviour by
Leo Pascual, Paulo Rodrigues, and David Gallardo-Pujol found that all in all, morality is supported not by a single brain circuitry or structure, but by a multiplicity of circuits that overlap with other general complex processes .In MR imaging,the anterior and medial prefrontal cortex and the superior temporal sulcus are activated when people feel guilt, compassion, or embarrassment. The higher cognitive decisions are especially worked out in those “higher”parts of the brain.
The frontal lobe links and integrates all components of behavior and sensory input at the highest level. Emotion,social adjustment,impulse control are “localized”here but highly integrated with the rest of the brain.Injury to parts of the frontal lobe may cause an inability to move part of the body or the whole side of the body. Speech may become halting, disorganized or be stopped except for single explosive words. Personality may change. Social rules of behavior may be disregarded. The executive functions, planning, abstract reasoning, impulse control, sustained attention and insight are all “located”there.
Guilt and passion activate the mesolimbic pathway, and indignation and disgust are activated by the amygdala.Only part of the cortex is made up of association areas in which sensory and motor information is combined and associated with our stored knowledge,memories.These association areas are the places in the brain that are responsible for most of the things that make human beings, human. These association areas are involved in higher mental functions, such as learning, thinking, evaluation,planning, judging, moral reflecting, figuring, and spatial reasoning.So we can conclude that there are clearly neural networks involved with the ideas of morality,emotion and passion.
Joseph LeDoux furthermore in his excellent book ,the synaptic self,wrote”Let us start with a fact:People don’t come preassembled,but are glued together by life. We all start out with different sets of genes;another is that we have different experiences...Nature and nurture both contribute to who we are,but they actually speak the same language.They both ultimately achieve their mental and

behavioural effects by shaping the synaptic organization of the brain.Psychotherapy ultimately uses biological mechanisms to treat mental illness,it is fundamentally a learning process for its patients,and as such is a way to rewire the brain.Most neuroscientists today believe that alterations in synaptic connectivity underlie learning,and that memory is the stabilization and maintenance of these changes over time.The essence of who you are is stored as synaptic interactions in and between the various systems of the brain."
As said Arvid Carlsson"Thinking is movement confined to the brain"and would define consciousness in the same way.
It is the degree of interconnectivity between neurons that creates consciousness ,intelligence , creativity,mind,will etc etc.
Einstein said "Information is not knowledge.The only source of knowledge is experience."
As we learn more about the synaptic mechanisms of memory,we learn more about the neural basis of the self."
As we go along in life,the brain changes ,and our resulting behaviour evolves,every second.
These findings have some very encouraging consequences even for a deterministic world.
We are not as helpless as a hungry man with a fork in front of a bowl of soup.We are not as a rudderless ship in a storm.About the storm we can do little ,but the ships,we can build sturdy with excellent compasses and rudders so that they can weather the storm when it comes.
Life is change,and the brain is a device for recording changes,for forming memories ,neural networks,through learning.
Your life shapes your brain, your brain shapes your life.
Most neuroscientists today believe ,says LeDoux,that alterations in synaptic connectivity underlie learning,and that memory is the stabilization and maintenance of these changes over time. Eric Kandell ,his mentor,said that"Learning alters the structure and function of nerve cells and their interconnections"In his chapter on;"The cellular mechanisms of learning and the biological basis of individuality",he explains the biological ,morphological ,physical,transformations of learning,on the synaptic transmissions in the brain in his book "The synaptic self ".
This is not hearsay,knowledge of the first kind,but peer reviewed hard science,knowledge of the second kind.
Therefore,as a society and as an individual we must learn,understand,educate,improve our knowledge of nature and its workings,through science.
Spinoza would call it reason.
As M Ravven writes"We can use the growing understanding of how the brain works to reshape our environments-and thus develop contexts and institutions that foster habits of thought and behaviour that further both the personal and general benefit-and we as individuals can also use that knowledge to broaden our thinking about the world and ourselves within it by intensive and enhanced learning"

Spinoza would thus certainly agree with Ravven,what he calls knowledge of the second kind,contrary to the knowledge of the first kind,hearsay or observation only through our senses,we must improve our reasoning through education,learning .He thinks that by doing so ,one day the third kind of knowledge,intuition,will come to you intuitively in a moment of clearvoyance,when you grasp the oneness of it all.Learning the world around us and within.

How is it possible today that members of the Flat Earth Society claim to believe the Earth is not round?They only take into consideration individual sense perception.Knowledge of the first kind.Walking around on the planet's surface, it looks and feels flat.They deem all evidence to the contrary, such as satellite photos of Earth as a sphere, to be fabrications of a "round Earth conspiracy" orchestrated by NASA and other government agencies.

Through quality science education ,teaching of civil and moral values we make quality citizens,despite the fact there is no free will and the world is a world of causality and determinism.

Teaching ,in its positive educational meaning ,is not a mere optional appendage to Spinoza's theory, but forms a necessary part of his concept of rationality.

He mentioned that "Insofar as men live according to the guidance of reason, they are most useful to man ,hence according to the guidance of reason, we necessarily strive to bring it about that men live according to the guidance of reason"

Johan Dahlbeck in his book Spinoza and Education writes that;

"The more students understand about themselves and the world,the more freedom of the mind they gain,and the more empowered they become in the sense that they are then the adequate cause of some of their actions.The end result of this is that they are able to make intelligent choices,grounded in an adequate understanding of themselves and the world in which they live."

Rabindranath Tagore says "The highest education does not merely give us information but makes our life in harmony with all existence".

"When educating the minds of our youth, we must not forget to educate their hearts," said the world-renown Tibetan leader, the Dalai Lama.

Psychotherapy is fundamentally a learning process for its patients says LeDoux,as such it is a way to rewire the brain.In this sense,psychotherapy ultimately uses biological mechanisms to treat mental illness,to (re)educate.

In the same way we may correctly (re?)wire students brains through quality education .

The core of teaching should consist of the basic human values;liberty, equality and fraternity ,no discrimination according to religion, sex and color, provide equality to all and freedom of speech,

dignity, truthfulness, fairness ,responsibility and freedom.This alongside and through the social and scientific sciences.

Improving the moral compasses ,our sturdy rudder,written into our brain which ,we saw,are an integral part of the decisionmaking processes in that brain.

M S Gazzaniga writes; »Many examples of moral circuits have been identified,and they seem to be distributed all over the brain.We have many innate

responses to our social world,including automatic empathy,implicit evaluation of others,and emotional reactions,and these all inform our moral judgements.Yet we typically do not think about these automatic responses nor appeal to them when explaining our decisions.Humans act commonly on moral challenges but claim different reasons for doing so.This is because there is a cacophony of influences that guide our behaviour and judgements.The influences involve emotional systems and special moral systems;the innate moral behaviour pours out,and then we give it an interpretation.We personally believe the interpretation and it becomes a meaningful part of our life.But what sets our responses are these universal properties that we all have ».

This moral decision-making goes on under the hood without our knowledge,unconsciously.We give a justification for our decision when asked for,but it has nothing to do with the internal proceedings in the brain,it is a post factum justification.

Feral childs do not have the same moral values as normal children.Once moral values are learned, they become integral part of our unconscious decision making process.

All teaching is founded on ethics ,but also a lot of ethics is founded on teaching. Governments that are serious about attracting the best ,knowledgeable and virtuous,people into teaching must look seriously at the status of teachers – alongside other factors such as their salaries.Students who had good teachers will probably become good parents and thus teach their children or students,good values .

Out of the 35 countries polled in 2018, the Asian nations of China, Malaysia, Taiwan, Indonesia, Korea and India rank higher in terms of social teacher status than every European country and every Western nation - including the US, New Zealand and Canada. South Americans accord teachers lower social status than any other region. Every South American nation polled ranked in the bottom half of the survey, with Brazil coming bottom and Argentina fifth from bottom. China is the only country where teachers are considered as highly skilled as doctors.Israel is at the bottom of the list.

In Finland, getting into a teacher training program is already an honor. Finnish teacher education programs are extremely selective, admitting only one out of every ten students who apply. Is it a coincidence that Finland always comes first as the happiest nation in the world?Among the least corrupt?

Three Scandinavian countries,Denmark,Suede and Norway,in a list of 200 countries,are among the top ten who spend the highest percentage of GDP on education.

In Singapore, all teachers are selected from the top tier of graduates.

The founders of this country, talking about the United States,Jessica Lahey wrote in The Atlantic, would “likely be horrified by the loss of this goal, as they all cite character education as the way to create an educated and virtuous citizenry.” According to Gallup polling, Lahey added, 90 percent of adults support the teaching in public schools of honesty, acceptance of others, and moral courage, among other character traits. What adults hope occurs in schools, however, is in sharp contrast to observations provided by teens themselves at schools..

Even though teachers status increases globally,in the world,In 28 of the 35 countries surveyed in 2018, teachers are being paid less than the amount people consider to be a fair wage for the job. The Global Teacher Status Index 2018 shows ,for the very first time, that there is a direct correlation between teacher status and pupil performance.
On the world level unfortunately,the spending on education as a percentage of world GDP has diminished in the last years.

A study by LANCE LOCHNER and ENRICO MORETTI concludes the following; “We estimate the effect of education on participation in criminal activity using changes in state compulsory schooling laws over time to account for the endogeneity of schooling decisions. Using Census and FBI data, we find that schooling significantly reduces the probability of incarceration and arrest. NLSY data indicate that our results are caused by changes in criminal behavior and not differences in the probability of arrest or incarceration conditional on crime. We estimate that the social savings from crime reduction associated with high school graduation (for men) is about 14–26 percent of the private return.”
According to the Hamilton Project, the United States spent more than $80 billion on corrections in 2010, with the majority of the burden put on states. In 2016, the U.S. Department of Education released an analysis which showed that over the course of nearly three decades—from 1979 to 2013—state and local spending on prisons and jails increased at three times the rate of funding for pre-K-12 public education over the same years. To put that into perspective, the state of Maryland currently spends around $12,000 per pre-K-12 public school student per year compared with around $37,000 per incarcerated person per year. Nationwide, the bulk of corrections spending goes toward housing the ever-growing prison population—a consequence of the rapidly expanding U.S. penal system that disproportionately punishes low-income people of color.
Investing in prison education rather than increased incarceration will also benefit the American economy. For any individual, not having a high school diploma ,closes doors to higher education, training, and employment opportunities. For formerly incarcerated individuals, the disadvantage of not having a high school diploma is compounded by the myriad barriers to successful reentry and additional stigma they face as they reenter their communities and the workforce. Education seems like a better use of tax money than funding the high recidivism rates that exist across the country.
Growing international evidence also suggests that policies designed to increase educational attainment and improve school quality significantly reduces crime rates.
Alma Gonzales in his thesis calculated as per statistical analyses, that increases in the educational level of populations are associated with significant decreases in the murder rate – even a 5% increase in the college graduation rate correlates to a significant, 16.5% decrease in the homicide rate.
Not only on crime rates does education influences,even life expectancy is a consequence.

The economists Anne Case and Angus Deaton have shown that, when it comes to mortality statistics, black people with a university degree have almost caught up with university-educated white people, while white people without a degree have fallen almost to the level of black people who lack university education. “Education,” they observe, “is now a sharper differentiator of expected years of life between 25 and 75 than is race, a reversal of the situation in 1990.

Spinoza permanently writes in his Ethics of ;learning,education,knowledge of the second kind,adequate ideas,reasons and reasoning,understanding causal relationships,science,so often that it appears an obsession.
« The more we know natural things,the greater and more perfect is the knowledge of God we acquire- or,since knowledge of an effect through its cause is nothing but knowing some property of the cause,the more we know natural things ,the more perfectly we know God’s essence,which is the cause of all things. »
The better we are at nurturing, the better we are at understanding our nature, and vice versa.
Education makes for better moral compasses in the brains of citizens.As Ravven argues”Our neuroplasticity blasts open our possible ways of being in the world to proportions unfathomable and,for all practical purposes,infinite.”
History ,today’s events and the social networks,shows us that this principle of teaching values and information,can also be cruelly and efficiently misused to put the wrong values in a large group of people’s brains,efficiently and professionally,with sometimes catastrophic international consequences.Free quality press ,strong democratic institutions ,liberty of philosophical ideas ,should prevent this,as Spinoza already insisted upon nearly 400 years ago,in the Age of Enlightenment,when such notions were only embryonic and still largely contested.
Finally there is nothing new under the sun.The best human life,as Aristotle argued,was the life of the mind,engaging in a lifetime of wide ranging investigation and learning.

Chapitre 10

Instruct them how the mind of man becomes
A thousand times more beautiful than the earth
On which he dwells, above this frame of things
In beauty exalted, as it is itself
Of quality and fabric more divine

William Wordsworth

Many people will wrestle with Spinoza's notions of the non existent free will,causal determinism,inevitable laws of nature on the one hand and our personal possibilities or impossibilities(?)to influence our behaviour on the other.Since our behaviour is the result of the flikkering of our synapses over which we do not have the slightest control,how can we in any way better our behaviour?
Why is it that Spinoza talks so often of reason,virtues,adequate ideas,and that these are apparently so important to him?So often he writes about these,that it sometimes looks obsessive.
The only reason is that these qualities are effectively the only factors that are in part under our control as a society,through education,to influence individual behaviour as we saw in the previous chapter.
But let us see here how causal determinism,and thus the absence of free will,influences our behaviour.

Spinoza criticized people who believed "that man rather disturbs than follows the order of nature, that he has absolute power over his actions ,tend to adopt a misguidedly moralistic attitude. They refer the cause of human weakness and inconstancy not to the common forces of universal nature, but to I know not what vice in human nature, which they therefore bewail, deride, despise, or more frequently detest." Spinoza thought that it was more fruitful to try to understand our emotions and actions than to hate or ridicule them .
"Determinism makes for a better moral life :it
teaches us not to despise or ridicule any one,or be angry with anyone.When a man accepts necessity it changes his experience.We accept ourselves and the others better,knowing that we are not free.
Such a man avoids hatred,envy ,contempt and other negative emotions.He is unaffected by fear,hope and superstition,he is secure in the knowledge that virtue is power,power gives freedom and happiness.His blessedness consists in the serene contemplation of the whole of things,bound in community with likeminded spirits,by the love which acknowledges as its cause freedom of the mind.He who understands himself and his emotions loves God,and the more so the more he understands himself and his emotions .This love,which stems necessarily from the pursuit of knowledge,is an intellectual love.The wise man insofar as he is considered as such,is scarcely moved in spirit:but,being conscious of himself,of God,and of the things,by a certain eternal necessity,he never ceases to be,but possesses eternally true complacency of spirit.Men can attain happiness and dignity only by identifying themselves,through knowledge and understanding,with the whole of nature and by submerging their individual being in this understanding."
A person understanding man's place in nature "hates no one,is angry with no one,envies no one,is indignant with no one,scorns no one,and is not at all proud"

As we saw,behaviour is the outcome of our brains calculations as E.R.Kandell a renowned neurologist states in his excellent book,"In search of memory," that"Each perception and thought we have,each movement we make,is the outcome of a vast multitude of basically neural calculations".
Neural calculations first discovered by another neuroscientist,Sherrington;"reciprocal neural controls enable singleness of action and purpose required for behaviour."His work on the spinal cord revealed principles of neuronal integration that were likely to underlie some of the brain's higher cognitive decision making as well.Here we see the beginnings of the important discoveries of the neurosciences emerging.

How does the brain decide our thoughts and actions?Here we come to our first problem,but also to our special societal input that we integrate into our brain's calculations.
The decision process in our brain incorporates the understanding of our social environment,part of which are the moral values we have acquired and which are written down in our synaptic networks that integrate memory throughout our life.
Eric Kandel says that "the regulation of the transient and long term effectiveness of synapses,occurs throughout later life and is determined by day-to-day experience.The brain stores an internal representation of experiential events that can be understood in terms of individual nerve cells and their interconnections."
By having obtained the correct vision of life,adequate ideas, the correct moral values ,through education,learning and positive life experiences,the neural connections will integrate these in its firing of synapses.Our behaviour will thus become socially more harmonious and in symbiosis with Nature,our nature.
We do not have a free will so we cannot decide by only individual pure meditation to possess adequate ideas,we must obtain these partly from outside our brain,they must come to us outside our will,from external sources to our body and brain.
Therefore,scientific education is indispensable to advance our correct understanding of our correct place in Nature.
Spinoza sets on the important values in life apart from the importance of reason and adequate ideas;
"the ordinary surroundings of life which are esteemed by men(as their actions testify)to be the highest good,may be classed under three heads-Riches,Fame,and the Pleasure of Senses;with these three the mind is so absorbed that it has little power to reflect on any different good.All the objects pursued by the multitude not only bring no remedy that tends to preserve our being,but even act as hindrances,causing the death not seldom of those who possess them,and always of those who are possessed by them...happiness or unhappiness is made wholly to depend on the quality of the object which we love...love towards a thing eternal and infinite feeds the mind wholly with joy...The chief good ...is the knowledge of the union existing between the mind and the whole of nature. To act according to the guidance of reason,to preserve once being,mean the same thing;to act according to virtue."
Spinoza knew this was not the morality of the day;
« Many suppose that the principle which obliges every man to seek his profit ,is the basis of immorality and not of virtue and sense of duty.But the truth is exactly the opposite. »
« The good which everyone who seeks virtue wants for himself,he also desires for other people;and this desire is greater as his knowledge of God is greater. »
But this striving must not be blind but strive for
what truly leads man to greater perfection .
In his treatise,On the Improvement of the Understanding,Spinoza lays down certain rules of life;

“First,to speak in a manner intelligible to the multitude and to comply with every general custom that does not hinder the attainment of our purpose.
Second ,to indulge ourselves with pleasures only insofar as they are necessary for preserving our health.
Lastly,to endeavour to obtain only sufficient money or other commodities to enable us to preserve our life and health,and to follow such general customs as are consistent with our purpose.”
Sporadically he gives throughout the Ethics some other recommendations;
“Nature is satisfied with little and if she is ,I am also.Know the strength and weakness of our nature in order to determine what reason can accomplish in mastering the effects and what it cannot accomplish .The greater the joy with which we are affected,the greater the perfection to which we pass,and consequently the more do we participate in the divine nature «
Similarly,once again ,the Vedanta states that once we are aware of the universal self,of our self not different from the one in others,we do not act on our emotions ,passions or impulses .Accepting the divine within oneself,the divine in others,the non- dual but the oneness of the universe and ourselves creates better understanding.
Devote Hindu greet and take leave with the words namaste,meaning,I bow to the Divine in you.
The German Sanskritist Goldstücker wrote that Spinozas thoughts were “ ...so exact a representation of the ideas of the Vedanta,that we might have suspected its founder to have borrowed the fundamental principles of his system from the Hindus(...)had Spinoza been a Hindu,his system would in all probability mark a last phase of the Vedānta philosophy.”
Even though we do not find in Spinoza’s biography proof of contact with the Buddhist philosophy,the Dutch East India Company,which had received a monopoly on the Dutch spice trade with India in the early 1600s,had important settlements along the coast of the Indian subcontinent.Trading posts with important numbers of Dutch settlers existed along the coast of the Indian subcontinent .The company was governed by six chambers,cities in Holland,of which Amsterdam was by far the most important.Thousands of Duch settlers had sailed on their hundreds of ships,trading goods between Holland and the Indian subcontinent.Spinozas father was a well to do merchant in food and spices in Amsterdam.All this put together it effectively would not be surprising that Baruch had touched on this Vedanta philosophy by way of contact with those merchants.
We saw that the acceptance of necessity frees us from envy,vexing,humiliation,anger,rancune towards anyone,but as importantly,also towards ourselves.The acceptance of causal determinism changes our attitude towards the others,it also changes our vision of ourselves.We will be liberated from sentiments of regrets,self pity,self blame,indecision,inferiority,inadequacy and so on.
The choices we made in the past and the destiny that resulted from these decisions were necessary and inevitable at that time.We couldn’t have done otherwise ,better or worse.Thus we will accept our choices and learn from them so as to improve our understanding and behaviour in the future.That is ,rewire our synapses learning from past mistakes.
The same goes for our decisions in the present that instantly become the past.
We do not have a free will but that does not at all mean our neocortex should stop working.To the contrary.The more our choices are reasoned and reasonable,the more “adequate “these are,the better social harmony will come about as well as our individual wellbeing.
Renouncing the exercise of our will ,which we do not have,doesn’t mean we are

condemned to inaction ,inactivity or ill considered behaviour.
The acceptance of determinism, creates positive thinking.
“A free man thinks of nothing less than of death,and his wisdom is a meditation not on death but on life.
His conduct is not determined by fear of death or the after death,rather he desires to do good ,to live a good life,to preserve his being.”
We should realize that each of us is a causal
but necessary link in the evolution of Nature,fully determined and without a free will.
. “the thought element of the mind that survives death bears the particular characteristics of the individual during his lifetime . “
« The human mind cannot be absolutely destroyed with the body,but something remains of it,which is eternal «
The writings of Spinoza have something of eternal since it influenced ideas of generations in the past,the present and probably the future.
The immortality of the mind,according to Spinoza, is personal and individual.
What is eternal of Einstein is ,among other things,E=MxC2 ,all of his contributions to the general theory and the influence he had on all the people and scientists he encountered in his life and later on through his writings.This is what we call eternity of the mind of Einstein.The part of us that lives on in generations to come is the body of knowledge and the molecules of the physical body.
The same goes for the DNA of our bodies in evolution if we had children.

Spinoza writes that “insofar as men live according to the guidance of reason, they must do only those things that are good for human nature, and hence, for each man, i.e., those things that agree with the nature of each man. Hence, insofar as men live according to the guidance of reason, they must always agree among themselves.It is in the nature of reason to perceive things under a certain aspect of eternity .By acquiring adequate knowledge we come to the intuitive understanding what is divine and eternal.”
“Our salvation consists in seeing the world “sub specie aeternitatis”,and in so doing,we free ourselves from the bondage of time,of emotions,and perceive the eternal and immutable will of God.”
We mentioned several times ,« Blessedness is not the reward of virtue,but virtue itself »
What does that mean?It means that when the adequate values ,realities (no free will and determinism)are impregnated ,burned into the synaptic circuits of our brain,the for us ,unconscious decision making process of our brain ,the trillions of firing synapses,will automatically attach importance to these memorized values in the firing of its synapses in its networks,its decision making process and ,in the outcome;our behaviour.Adequate decisions ,blessedness and joy will logically ,inevitably,follow.Virtue and blessedness are the same thing,one does not exist without the other.Virtue can be thought,learned,incorporated in our thinking.Spinoza wrote;
“The superstitious know how to reproach people for their vices better than they know how to teach them virtues, and they strive, not to guide men by reason, but to restrain them by fear, so that they flee the evil rather than love virtues. Such people aim only to make others as wretched as they themselves are, so it is no wonder that they are generally burdensome and hateful to men.”
Spinoza,as we saw,often talks of the importance of intuition.
“The more you struggle to live, the less you live. Give up the notion that you must be sure of what you are doing. Instead, surrender to what is real within you, for that alone is sure....you are above everything distressing.”
“Intuition of necessity results in activity,serenity.It makes us more independent from hope and frees us from fear,negative emotions,and command our fate to the best of our

powers.Help our fellow men and join with them in friendship. He will find nothing deserving of hatred,mockery or contempt,nor will he pity anyone,rather,he will endeavour,to the best of his ability,to act well and be happy. Happiness is virtue, not its reward.”
“Those who expect God to reward them for a virtuous life are far from the truth,far from true idea and reality of virtue.They behave as if virtue itself was not happiness in itself and the highest freedom.
The rational,ethical life is to be sought after for its own sake,not for the sake of something else.
When it is regarded as a means to something else ,it ceases to be virtue.”
“The good which every man, who follows after virtue, desires for himself he will also desire for other men...Peace is not the absence of war, but a virtue based on strength of character. The endeavor to understand is the first and only basis of virtue. »
Here once again we come back to the conatus as he writes;
"the more each one seeks his own advantage, and strives to preserve himself, the more he is endowed with virtue, or what is the same, the greater is his power of acting according to the laws of his own nature, that is, of living from the guidance of reason. But men most agree in nature when they live according to the guidance of reason. Therefore, men will be most useful to one another, when each one most seeks his own advantage”

God ,Nature and Substance is an entirely
integrated system.To come to understand any particular part of it is necessarily to come to understand more of the whole.We cannot take out some parts of it,otherwise we destroy the whole.If we are to understand ourselves and the other things,we will in the process come to learn and understand about Nature as a whole.Just as Spinoza has been classified as a materialist ,a positivist,he has been,as much,vilified for his mysticism.His “intellectual love of God” may offend more than one.But clearly he was not detached from the earth,on the contrary,his philosophy is radically founded on Nature and the understanding and study of its forces in the universe in ourselves and in society as a whole.We must learn and study as if we lived eternally and we must live today as it was our last day on earth.The more you understand Nature,the more you understand God ,the more you understand Substance ,the more you understand yourself and the others.
The more we take pleasure ,as philosophical naturalists,in analyzing the order of natural causes,the more we can be said to have an intellectual love of God.There is no difference,for Spinoza,between the spiritual and the natural world.
That is the consequence of his mind body attitude we discussed at large.
Curiosity and delight in the infinite complexities and beauty of Nature equals love of God.
Re create in your mind the self creative activity of Nature and in so doing transcend your condition as finite and perishable.The union of ourselves with Nature we will never completely and permanently achieve,but must always pursue.
Love is pleasure,is oneness,but only if the object of our love gives us pleasure,there is love.

Chapitre 11

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A thousand times more beautiful than the earth
On which he dwells, above this frame of things
In beauty exalted, as it is itself
Of quality and fabric more divine

William Wordsworth

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Therefore,scientific education is indispensable to advance our correct understanding of our correct place in Nature.
Spinoza sets on the important values in life apart from the importance of reason and adequate ideas;
"the ordinary surroundings of life which are esteemed by men(as their actions testify)to be the highest good,may be classed under three heads-Riches,Fame,and the Pleasure of Senses;with these three the mind is so absorbed that it has little power to reflect on any different good.All the objects pursued by the multitude not only bring no remedy that tends to preserve our being,but even act as hindrances,causing the death not seldom of those who possess them,and always of those who are possessed by them...happiness or unhappiness is made wholly to depend on the quality of the object which we love...love towards a thing eternal and infinite feeds the mind wholly with joy...The chief good ...is the knowledge of the union existing between the mind and the whole of nature. To act according to the guidance of reason,to preserve once being,mean the same thing;to act according to virtue."
Spinoza knew this was not the morality of the day;
« Many suppose that the principle which obliges every man to seek his profit ,is the basis of immorality and not of virtue and sense of duty.But the truth is exactly the opposite. »
« The good which everyone who seeks virtue wants for himself,he also desires for other people;and this desire is greater as his knowledge of God is greater. »
But this striving must not be blind but strive for
what truly leads man to greater perfection .
In his treatise,On the Improvement of the Understanding,Spinoza lays down certain rules of life;

“First,to speak in a manner intelligible to the multitude and to comply with every general custom that does not hinder the attainment of our purpose.
Second ,to indulge ourselves with pleasures only insofar as they are necessary for preserving our health.
Lastly,to endeavour to obtain only sufficient money or other commodities to enable us to preserve our life and health,and to follow such general customs as are consistent with our purpose.”
Sporadically he gives throughout the Ethics some other recommendations;
“Nature is satisfied with little and if she is ,I am also.Know the strength and weakness of our nature in order to determine what reason can accomplish in mastering the effects and what it cannot accomplish .The greater the joy with which we are affected,the greater the perfection to which we pass,and consequently the more do we participate in the divine nature «
Similarly,once again ,the Vedanta states that once we are aware of the universal self,of our self not different from the one in others,we do not act on our emotions ,passions or impulses .Accepting the divine within oneself,the divine in others,the non- dual but the oneness of the universe and ourselves creates better understanding.
Devote Hindu greet and take leave with the words namaste,meaning,I bow to the Divine in you.
The German Sanskritist Goldstücker wrote that Spinozas thoughts were “ ...so exact a representation of the ideas of the Vedanta,that we might have suspected its founder to have borrowed the fundamental principles of his system from the Hindus(...)had Spinoza been a Hindu,his system would in all probability mark a last phase of the Vedānta philosophy.”
Even though we do not find in Spinoza’s biography proof of contact with the Buddhist philosophy,the Dutch East India Company,which had received a monopoly on the Dutch spice trade with India in the early 1600s,had important settlements along the coast of the Indian subcontinent.Trading posts with important numbers of Dutch settlers existed along the coast of the Indian subcontinent .The company was governed by six chambers,cities in Holland,of which Amsterdam was by far the most important.Thousands of Duch settlers had sailed on their hundreds of ships,trading goods between Holland and the Indian subcontinent.Spinozas father was a well to do merchant in food and spices in Amsterdam.All this put together it effectively would not be surprising that Baruch had touched on this Vedanta philosophy by way of contact with those merchants.
We saw that the acceptance of necessity frees us from envy,vexing,humiliation,anger,rancune towards anyone,but as importantly,also towards ourselves.The acceptance of causal determinism changes our attitude towards the others,it also changes our vision of ourselves.We will be liberated from sentiments of regrets,self pity,self blame,indecision,inferiority,inadequacy and so on.
The choices we made in the past and the destiny that resulted from these decisions were necessary and inevitable at that time.We couldn’t have done otherwise ,better or worse.Thus we will accept our choices and learn from them so as to improve our understanding and behaviour in the future.That is ,rewire our synapses learning from past mistakes.
The same goes for our decisions in the present that instantly become the past.
We do not have a free will but that does not at all mean our neocortex should stop working.To the contrary.The more our choices are reasoned and reasonable,the more “adequate “these are,the better social harmony will come about as well as our individual wellbeing.
Renouncing the exercise of our will ,which we do not have,doesn’t mean we are

condemned to inaction ,inactivity or ill considered behaviour.
The acceptance of determinism, creates positive thinking.
“A free man thinks of nothing less than of death,and his wisdom is a meditation not on death but on life.
His conduct is not determined by fear of death or the after death,rather he desires to do good ,to live a good life,to preserve his being.”
We should realize that each of us is a causal
but necessary link in the evolution of Nature,fully determined and without a free will.
. “the thought element of the mind that survives death bears the particular characteristics of the individual during his lifetime . “
« The human mind cannot be absolutely destroyed with the body,but something remains of it,which is eternal «
The writings of Spinoza have something of eternal since it influenced ideas of generations in the past,the present and probably the future.
The immortality of the mind,according to Spinoza, is personal and individual.
What is eternal of Einstein is ,among other things,E=MxC2 ,all of his contributions to the general theory and the influence he had on all the people and scientists he encountered in his life and later on through his writings.This is what we call eternity of the mind of Einstein.The part of us that lives on in generations to come is the body of knowledge and the molecules of the physical body.
The same goes for the DNA of our bodies in evolution if we had children.

Spinoza writes that “insofar as men live according to the guidance of reason, they must do only those things that are good for human nature, and hence, for each man, i.e., those things that agree with the nature of each man. Hence, insofar as men live according to the guidance of reason, they must always agree among themselves.It is in the nature of reason to perceive things under a certain aspect of eternity .By acquiring adequate knowledge we come to the intuitive understanding what is divine and eternal.”
“Our salvation consists in seeing the world “sub specie aeternitatis”,and in so doing,we free ourselves from the bondage of time,of emotions,and perceive the eternal and immutable will of God.”
We mentioned several times ,« Blessedness is not the reward of virtue,but virtue itself »
What does that mean?It means that when the adequate values ,realities (no free will and determinism)are impregnated ,burned into the synaptic circuits of our brain,the for us ,unconscious decision making process of our brain ,the trillions of firing synapses,will automatically attach importance to these memorized values in the firing of its synapses in its networks,its decision making process and ,in the outcome;our behaviour.Adequate decisions ,blessedness and joy will logically ,inevitably,follow.Virtue and blessedness are the same thing,one does not exist without the other.Virtue can be thought,learned,incorporated in our thinking.Spinoza wrote;
“The superstitious know how to reproach people for their vices better than they know how to teach them virtues, and they strive, not to guide men by reason, but to restrain them by fear, so that they flee the evil rather than love virtues. Such people aim only to make others as wretched as they themselves are, so it is no wonder that they are generally burdensome and hateful to men.”
Spinoza,as we saw,often talks of the importance of intuition.
“The more you struggle to live, the less you live. Give up the notion that you must be sure of what you are doing. Instead, surrender to what is real within you, for that alone is sure....you are above everything distressing.”
“Intuition of necessity results in activity,serenity.It makes us more independent from hope and frees us from fear,negative emotions,and command our fate to the best of our

powers.Help our fellow men and join with them in friendship. He will find nothing deserving of hatred,mockery or contempt,nor will he pity anyone,rather,he will endeavour,to the best of his ability,to act well and be happy. Happiness is virtue, not its reward.”
“Those who expect God to reward them for a virtuous life are far from the truth,far from true idea and reality of virtue.They behave as if virtue itself was not happiness in itself and the highest freedom.
The rational,ethical life is to be sought after for its own sake,not for the sake of something else.
When it is regarded as a means to something else ,it ceases to be virtue.”
“The good which every man, who follows after virtue, desires for himself he will also desire for other men...Peace is not the absence of war, but a virtue based on strength of character. The endeavor to understand is the first and only basis of virtue. »
Here once again we come back to the conatus as he writes;
"the more each one seeks his own advantage, and strives to preserve himself, the more he is endowed with virtue, or what is the same, the greater is his power of acting according to the laws of his own nature, that is, of living from the guidance of reason. But men most agree in nature when they live according to the guidance of reason. Therefore, men will be most useful to one another, when each one most seeks his own advantage”

God ,Nature and Substance is an entirely
integrated system.To come to understand any particular part of it is necessarily to come to understand more of the whole.We cannot take out some parts of it,otherwise we destroy the whole.If we are to understand ourselves and the other things,we will in the process come to learn and understand about Nature as a whole.Just as Spinoza has been classified as a materialist ,a positivist,he has been,as much,vilified for his mysticism.His “intellectual love of God” may offend more than one.But clearly he was not detached from the earth,on the contrary,his philosophy is radically founded on Nature and the understanding and study of its forces in the universe in ourselves and in society as a whole.We must learn and study as if we lived eternally and we must live today as it was our last day on earth.The more you understand Nature,the more you understand God ,the more you understand Substance ,the more you understand yourself and the others.
The more we take pleasure ,as philosophical naturalists,in analyzing the order of natural causes,the more we can be said to have an intellectual love of God.There is no difference,for Spinoza,between the spiritual and the natural world.
That is the consequence of his mind body attitude we discussed at large.
Curiosity and delight in the infinite complexities and beauty of Nature equals love of God.
Re create in your mind the self creative activity of Nature and in so doing transcend your condition as finite and perishable.The union of ourselves with Nature we will never completely and permanently achieve,but must always pursue.
Love is pleasure,is oneness,but only if the object of our love gives us pleasure,there is love.

Chapitre 12

Cannabinoids are compounds found in the plant cannabis .There are more than a hundred different of them.
Here there are only two main compounds we are interested in;
CBD or cannabidiol and Tetrahydrocannabinol or
THC.Both compounds ,when they get into your bloodstream ,and traverse the brain barrier become neurotransmitters and influence the synapses' electric impulses and thus our behaviour.
THC is the compound that gets you "high "whereas CBD makes you" Cool"
The brain's endogenous chemical neurotransmitter anandamide and the drug THC are similar in structure.Similarity in structure allows drugs to be recognized by the brain's synapses and alter its normal communication.The same goes for CBD for which the brain has receptors,because it has a endogenous transmitter with a similar structure.
So there are two kinds of CBD,Cannabinoids according to where they originate ;
The exogenous Cannabinoid,coming from outside your system through smoking marijuana or ingesting CBD oil,and the endogenous cannabinoid CBD, that is produced by the body itself ,through cleavage of phospholipid precursors present in the membranes of neurons, glia, and other cells .These were only discovered in the early nineties.
The way to naturally increase your endogenous cannabinoid is trough positive social interactions,yoga,massage and loving caresses...
The endogenous CBD cannabinoid system and its neurotransmitters and receptors in our body is one of the most important physiological systems involved in establishing and maintaining homeostasis .Endocannabinoid transmitters and their receptors are found throughout the body: in the central and peripheral nervous system,organs, connective tissues, glands, immune cells and more.
Wether the Cannabinoid transmitter CBD is arrived in your system from the cannabis you smoked or the sativa ,CBD oil you swallowed,wether it comes from within your system ,the effect is the same,it interacts with the same receptors of the nervous system;
CB1 receptors,are mostly found in the central nervous system
CB2 receptors,are mostly found in your peripheral nervous system, especially immune cells.
But the cannabinoid transmitter can go to either receptor,so it is really active throughout the whole body through the whole nervous system.These qualities are linked to CBD's ability to act on the brain's receptors for serotonin, a neurotransmitter that regulates mood and social behaviour.
The cannabinoid system's main function is to contribute to homeostasis, which refers to stability of your internal environment. For example, if an outside force, such as pain from an injury or a fever, throws off your body's homeostasis, it kicks in to help your body return to its ideal functioning.
It alleviates anxiety,nausea,pain,stress,etc.
Dogs are reported to have a higher number of cannabinoid receptors in their brain compared with humans.

People who still are convinced that mind and body are two separate entities,that our thoughts,ideas,mood and behaviour are independent from the physical world and its natural laws should take only one drop of sativa oil and experience how it profoundly alters your mood for the whole day.
Now the story.
One day,when I lived in Senegal,I asked my gardener to bring topsoil to improve the garden.
In Senegal marijuana is a popular herb,it is called,
“The herb that kills “.As by wonder,a few days later,plenty of young marijuana plants sprouted all over my garden.As my two kids were at the age where those plants were interesting , I did not have to encourage them to take up gardening . Each of them started a well tended plot,marijuana flowers started to blossom...
Then one day my daughter’s flowers started to disappear .She normally is a calm person,but started to get angry with her brother,who was rather certain of his innocence.The house was interrogated,no culprits.
Then a few days later i saw my rottweiler royal nibble at the flowers.We had a beautiful tropical garden with hundreds of different plants,but it were only these that this carnivore preferred.
I think you will agree with me that my dog has no free will.
The urge to satisfy the demand of the cannabinoid
receptors for the CBD neurotransmitter is apparently a natural phenomenon.The problem comes when it is mixed with the THC.
CBD oil avoids this negative side effect and therefore has lots of medicinally benefits.

This story is to show that our brains are fantastic chemically,biologically evolved organs,to improve our chances of survival.
If you do not believe our behaviour completely depends on our physical brain and it’s inputs,just experience the effect of one little drop of CBD oil under your tongue and how it changes your attitude for a day.How it transforms your thoughts,calms your anxiety and dissipates your anger,if you had any.

Here we talked of one neurotransmitter only recently discovered,but there are more than hundred we know of today ,that have tremendous consequences on our ,synapses and thus behaviour and thoughts,all beyond our control.They evolved to assist the brain and therefore our whole organism to survive.Once again we see Spinoza’s conatus at work.
The neurotransmitters ;Oxytocin,vasopressin,endorphin and endocannabinoids are associated with the simple pleasure of being with a liked person.

Another example of the conatus at work through our brains and its transmitters is described in the book written by D Z Lieberman and M E Long entitled “ The molecule of more” how a single chemical in your brain drives love,sex,and creativity; dopamine.
They state” Wanting,or desire,flows from an evolutionary old part of the brain deep inside the skull called the ventral tegmental area.It is rich in dopamine:in

fact,it is one of the two main dopamine-producing regions.Most cells that grow there have long tails that wind through the brain until they reach a place called the nucleus accumbens.When these long tailed cells are activated,they release dopamine in the nucleus accumbens,driving the feeling we know as motivation.”This is also called the dopamine desire circuit,that evolved to promote behaviours that lead to ,and promotes,survival and reproduction,they write.
Unfortunately,addictive drugs,”hit the desire circuit with an intense chemical blast,like a guided missile.No natural behaviour can match that.Not food ,not sex,not anything.”
“Alcohol does it,heroin does it,cocaïne does it,even marijuana does it.Some chemicals are better than others at pushing dopamine along its path.”
“Desire dopamine overpowers the more rational parts of the brain.”
“Addiction is not a sign of weak character or a lack of willpower.It occurs when the desire circuits get thrown into a pathological state by overstimulation.”

The moral of this short story .They conclude “Don’t mess with dopamine.It hits back hard.”

Conclusion

Whene'er the mist, that stands 'twixt God and thee,
[Sublimates] to a pure transparency,
That intercepts no light and adds no stain
There Reason is, and then begins her reign

S T Coleridge

Spinoza's rationalist philosophy was central to the "radical" Enlightenment of late seventeenth century Europe,but we can say that 400 years later,he still is an enlightening philosopher for our second millennium .

The various sciences provide explanations of particular kinds and classes of natural events and of the interconnections between them.What is missing in these very specialized fields of knowledge is the crossbreeding between all these little knowledges.
Ought we not to look for all embracing explanations of the origin and design of Nature,as well as studying particularities?
Science needs metaphysics and metaphysics need science,according to Einstein;philosophical thinking makes for the "distinction between a mere artisan or specialist and a real seeker after truth" he said.
Spinoza has always been a great fan of scientific explanations of natural phenomenon,and categorically refused all irrational explanations of events.His ideas of an infinite,eternal and self creating substance may seem too subtle,abstract and remote at first glance,compared to the common orthodox doctrines of creation by a supreme being.
He always insisted ,in a period of history where it was blasphemy,that there could not be creation or creator in any simple sense of the word.
He thought he had explained the existence of things in the only way the existence of things could be explained.His whole metaphysics is substantially contained in his notion of Substance,as a whole.
The fact that it exists on the one hand ,and that it evolves Naturally on the other hand were enough for him to launch him on the way to all his final conclusions and explanations .Substance by itself is to be regarded as completely intelligible by itself,standing on its own.
The gobsmacked progress the neurosciences have made in the last decade,confirm Spinoza's visionary ideas on the free will and the mind body problem .The solid basis of his philosophical structure.
We are only beginning to understand and accept the immensely important and far reaching consequences these ideas have for men ,Nature and society.Ideas which Spinoza had intuitively,but that are now scientifically confirmed thanks to the immense progress in the neurosciences.Neurosciences confirm Spinoza's intuition and make it indisputable.
He identified ,400 years ago,certain customary beliefs as especially misleading:

for example, the ideas of a creator God outside nature and the existence of free will.Also the view that each person is a distinct substance, sufficient unto himself. It is precisely these entrenched habits of thinking that are targeted in the Ethics. This suggests that the book is not just a philosophical treatise, but also a kind of training manual for the philosophical way of life .Therefore reading it is a transformative spiritual exercise. As one attains a deeper understanding of that philosophy , your own activity of thinking will come to replace passive acceptance of prevailing superstitions and prejudices.
Spinoza tells us that this transition from passivity to activity is always empowering, liberating and joyful.
He was too liberal and modern in his views in the 1600's, and he unfortunately remains so for many today,nearly 400 years later.
72% of Americans believe in an actual heaven, and 58% in an actual hell.
Maybe one day being called a Spinozist will cease to be an insult among intellectuals ,as it has been for so long .
“The important thing is,(according to Einstein,)not to stop questioning.Curiosity has its own reason for existing.”
What is certain is,that,if more people would think as Spinoza,there would be more peace on earth ,and more people at ease with themselves and others.

Please.Remember;

A tree is not responsible for the shape of his trunk,
the lion is not responsible for the state of his mind.
For exactly the same reasons ,you are not responsible for the configuration of your brain.
Not yours ,no body is.

. “What we have loved, others will love, and we will teach them how; Instruct them how the mind of man becomes a thousand times more beautiful than the earth on which he dwells “

William Wordsworth