

JAVA FOR THE STUDY OF EVOLUTION
VOLUME XVIII
THE EVOLUTIONARY THEORY IS
OBVIOUSLY FALSE

José del Carmen Rodríguez Santamaría
<http://www.ejristos.com>

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Preface

The series *Java for the Study of Evolution* is directed to scientists that want to manage a serious but not excessively expensive tool to study evolution by direct experimentation under perfectly controlled conditions. These requirements cannot be met in nature but only in simulations and mathematical models. In consequence, the series has three main purposes:

1. To endow the community of **researchers in biology and evolution** with *high level programming*, enabling an accurate study of models and simulations of the most diverse nature.
2. To clearly show how this tool is used to study the fundamental questions of evolution.
3. To suggest that the study of Java could be *very fruitful* for **undergraduates** in biological sciences even more than calculus alone.

This is the 18th volume: The Evolutionary Theory is the pride of the Great Science. It follows clearly that God if He exists, has nothing to do with us. But common sense says that this theory is false: that so much complexity and perfection of living beings have been appearing by evolution without leaving a trace of any imperfection, is something that must be a lie. The author proposes a justification for the verdict of the instinct and declares himself satisfied to live in the fear of the Lord Creator of life and everything that exists. The text is written in an interview format.

Introduction

1. By looking at the section *Java for the study of evolution* of your website, one rapidly realizes that you do not believe in the Evolutionary Theory. Thus, how can you explain that evolution is the greatest pride of current science? Are scientists crazy? What happens?

Everyone believes in evolution because with flying colors it is very reasonable. And besides, it has a lot of truth.

2. Then, let's see.

Bogotá, Colombia,

José Rodríguez
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Chapter 1

EVOLUTION IS VERY REASONABLE

1.1 Fundamental concepts

3. What is the evolution for you?

Evolution is something we all do every day primarily to meet two types of goals. The first is to dominate and manipulate. The second is to fight for personal fulfillment, for perfection. The general recipe or algorithm is as follows: if something does not work for us, we make changes, that is, **mutations**, and if we are still unsatisfied, we investigate, that is, we mix, **recombine** what we know with what others know. Next, we look at how it goes, that is, we **select** the best. By repeating and repeating the process, we progress. The latter is called **recursion**.

EXAMPLE: The Evolution as an instrument to manipulate: The grandfather tells his grandson: *If this cell phone were not so old, I would give it to you.* And on another occasion, he says: *My sound system is very good, but it is very heavy and I suffer a lot when I want to move it.* Sometime later the grandson tells his grandfather: *You said you would give me the remote-controlled helicopter if it wasn't so old. But I've already thought about it and that doesn't matter to me. I accept it.* Here we see the grandson recombining expressions of his grandfather and mutating them to accommodate their goals: to get a gadget for free that is great both for fun and to generate envy among his friends. Once the grandfather reacts, the grandson will assess the situation to continue building his attack.

EXAMPLE: Evolution as an instrument for personal fulfillment: a girl is

learning to peel oranges. At first, she is more worried about not cutting herself than in doing a good job, it takes up to ten minutes trying, trying, until, exhausted, she asks her little brother for help. She is very impressed that the little brother can take out small cords of the shell of several centimeters long. But seeing that the little brother does not wash his hands, she prefers to continue trying for herself and her first major goal apart from not cutting herself will be to lengthen the shell cords.

At first, her pieces of shell do not exceed one centimeter. But little by little he learns to control the cutting procedure and the skins begin to form a cord that is getting longer and longer. After a few years, she can already peel her orange in a single cut, without hurting the pulp and leaving it free of any skin, and she can rebuild a sphere with the resultant cord.

Where is the mutation? In that she made many changes in the way of taking the knife, more difficult than taking a pencil, and in the criterion to decide on each orange the angle of attack to achieve her objective. The problem is that there are oranges whose white flesh is very thin but in others, it is very thick.

Where is the recombination? In that she developed at first strategies to lengthen the cord but later to make the cord of the adequate thickness, without leaving white flesh and without hurting the pulp. And only very late could she recombine strategies from here and there to do both at the same time and produce a clean and woundless pulp.

Where is the selection? In that she could not bear the criticisms of her little brother when he saw the oranges very wounded and with part of the white flesh of the peel. And all this without cutting herself. A total concentration is required. As a consequence, she sharpened her quality control by demonstrating that there was a natural process of selecting the best strategy.

And where is the recurrence? In the hundreds of oranges that she peeled for several years but always trying to improve until she finally managed to reach the perfection that she loves to show peeling papayas and potatoes. And to peel cassava? No. Peeling cassava is something for adults. In case of emergency, give her an arracacha.

EXERCISE: Tell an experience of your own life in which you have applied evolution. Explain where mutation, recombination, selection, and recurrence appear. Help: get inspired by the way you recombine your clothes to look just as you like. Or how you use evolution to design the menus of the week. Or the way you continually rearranges the furniture stalls. Or the things that you invent to surprise. Tell everything you suffer to do a good essay for school or a good composition for college. What if you start to invent a poem or a song and record the way you

recurrently use mutation and recombination to do something that satisfies you?

4. How does the evolutionary process that we all do at all times and in all places relate to the Evolutionary Theory that explains how the man appeared from the monkey?

Who said that the man came out of the monkey? Who has proved it? The Evolutionary Theory proposes that the man appeared from the monkey and offers the natural evolution as a possible explanation that is accepted by the Great International Science and by everyone who considers himself serious and actual. The importance of the theory is immediate: the incredible perfection of all species demands an explanation. The religious one is to invoke God. This belief cannot compete with a demonstration that life is a product of the laws of nature. It is the same as what happens with the soup: if the older sister can show that she made it, all discussions are redundant. Nothing to claim. Nothing to add. Nothing to remove: she did it, and that is all to it.

To formulate the theory, we can take into account the impressive resemblance between the various species. For example, the high degree of coincidence between the entrails of a fish and those of a chicken is evident and surprising. Therefore, in its most natural formulation the Evolutionary Theory says that the son of a tiger is painted and that when one species is born from another, the two closely resemble each other.

Well, starting from Darwin and Mendel around 1850, science has developed tremendous support for the idea that evolution exists in living beings and that it is responsible for the origin of species. Darwin formulated the process and defended it impressively. For his part and at the same time and without looking for it, Mendel gave us the tools to decipher how this process is implemented in living beings.

In the modern terms of molecular biology, everything now refers to DNA. Mutations occur when the genetic information in the DNA changes and recombination is reduced to cutting and pasting different pieces of genetic information. When the new mutant-recombinants have to survive, some can do it but others not. If survival and subsequent reproduction is recurrent and associated with genetic information, we say that the environment has selected the most fitted. That is why the theory says: *the fittest survive and reproduce, the others die*.

The theory predicts that with the ongoing of many generations, with recurrence, organisms are perfected and grow in complexity, while new species are produced. All this does not depend fundamentally on DNA itself. In fact, according to the Evolutionary Theory, neither man nor monkey is of any importance but the only thing that matters is a process of universal validity that applies to all species.

EXAMPLE: DNA is a thread, a chain with 4 types of links, each represented

by a letter A, T, C, G. The DNA allows the duplication of the genetic information, something necessary for parents to have children who resemble them. The mechanism is very simple: the 4 bases or classes of molecules are complementary 2 to 2: A with T, and C with G. Complementation is stereophysical, that is, there is spatial complementation, which once reached is stable because there are forces of attraction that sustain it. So if one has the chain

TATATCGGCTAGCTGACAGAT

The complementary bases are automatically aligned, leaving a double-stranded chain:

TATATCGGCTAGCTGACAGAT

ATATAGCCGATCGACTGTCTA

This was discovered by taking crystallized DNA molecules and studying their X-ray spectrography. In the original chain, the one above, the consecutive bases are glued. In the new chain no. A polymerase is required to sew the bases one to another. To make a chain the same as the original, a second duplication is required.

EXERCISE: Complementation between the bases depends on the shape of each one, but it turns out that they can rarely take different forms and pass through molecules of the wrong complementation group. That implies that the mutation is immanent to life. Research the details. Hint: ask Google: *DNA Replication and Causes of Mutation*.

5. It is alarming that in your version of biological evolution you do not mention natural selection. Do you have any idea why you forgot about it?

Natural selection does not exist, instead it is an anthropomorphism. If we were in the Greek culture of the sixth century BC, it would be the god of perfection, whose role would be the same as the agronomist who selects the best variant of vineyards without seeds to sow it throughout the farm. But in Darwinian evolution, there is no such engineer, nor such a god. All to it is that someone lives and reproduces and someone dies without reproducing. The 007 made it very clear: *Live and let die*. However, this anthropomorphism has been very productive and is used at all times in both mathematical models and simulations. Natural selection is represented by a parameter of direct meaning: *do the right things well and survive and get a high probability of reproducing, else condemn yourself to disappear without leaving children*. This is how we simulate natural selection almost everywhere.

EXAMPLE: The death of the least fit is something serious. This is attested by malaria, which is caused by a blood parasite. There are some persons very susceptible and could die, while others are not and survive in relatively good condition.

This depends on the genetic information of each person. Deaths from this plague add up approximately to half a million a year on the tropics, especially in Africa.

EXERCISE: Analyze and digest the following reasoning that includes a fact, a prediction, and a mystery. Fact: immune people to malaria naturally appear in every population. Prediction according to the Evolutionary Theory: the relative frequency of non-susceptible people shall increase until the disappearance of the disease. Mystery: the disease is a plague even today and for its cause, many doctors are employed. What's happening here? Help, search the Internet for the genetic mechanism of malaria immunity and explain why it is not necessary to take into account that the parasite also evolves. This case shows that Darwinism is wrong without Mendelism. By Darwinism, we understand the death of the least fit and by Mendelism the fact that inheritance depends on the genes that are discrete entities and that in humans come in pairs, a version of the mother and another of the father. So, a unification of Darwinism with Mendelism is necessary: it is *the Synthetic Theory of Evolution*, the current framework of Science, that was formulated almost a century ago.

6. You don't talk about intraspecific competition either. What can you tell us?

Such intraspecific competition is a quantitative, anthropomorphic theory about the most important component of natural selection: *because there is population variability, there will always be some less apt than others. And, as resources are always scarce, the recurrent death of the misfit immediately releases resources so that survivors can continue in their struggle. Therefore, everything happens as if the fittest killed the less apt for its benefit.*

COUNTEREXAMPLE: According to the Evolutionary Theory, those that succeed are the ones that have to reproduce the most. In the case of humans, those who succeed are the rich. Therefore, the rich are expected to reproduce the most. But throughout the world, it is the poor who generally reproduce the most. This is explained because a child is the most wonderful of all possessions for a poor mother and each of them gives her each morning the strength to fight a whole day and with overtime. On the other hand, for a rich person, his or her most beloved possession is the time to dedicate to him or herself.

7. The mentioned anthropomorphisms seem to be good ideas: are they more than pedagogical aids?

There is a lot of mathematics between the record of the systematic death of certain individuals and the formulation of natural selection as a parameter. Likewise,

there is too much science, field observations, and theories, between not understanding why populations change and having a mathematical model according to what has been observed. The mathematical part concerns the easy questions and is overdeveloped but the difficult questions are raw. The easy questions are related to the evolution of variants connected by mutation and in which their relative frequencies change. Difficult questions relate to the origin of complexity.

EXAMPLE: Some people are large-scale practitioners of free love but are immune to AIDS. While others get ill at the first adventure. One of the reasons to explain such a disparity has to do with the mechanism of infection: the AIDS virus uses a natural mechanism that white blood cells employ to do their work. Such a mechanism is encoded by a gene. But this gene is polymorphic, that is, it has variants produced by spontaneous mutation. Some variants allow the virus to act and put the patient in danger of death, while others not, so their carriers get immunity. We predict: In a population where there is AIDS and there is no medical treatment, the relative frequencies of the alleles or variants will move increasing the allele that gives immunity. The prediction is false and the reason is that the carriers of the virus that are immune spread it with great efficiency. Details like this add up to a whole science: *population genetics*.

EXERCISE: The molecular polymorphism caused by mutation in many genes allowed Kimura in 1968 to formulate *the Neutral Theory of Molecular Evolution: the evolution of molecular polymorphism, in general, has nothing to do with fitness but with the game of chance included in reproduction and which makes relative frequencies rise and fall at random*. Investigate about this theory and whether it endangers or not the Evolutionary Theory, which is built on natural selection.

1.2 Simulations

8. How do you simulate the evolution in the computer?

We can understand it if we play the game "guess-guesser". The task in that game is to guess a word or a phrase. One player is the guesser and the other is the judge. The guesser says his prediction, the judge qualifies it as cold, hot or perfect. The guesser makes more and more predictions, mutating and recombining. And so on until the solution is reached.

EXAMPLE: Let's make a simulation: the judge decides that the word to guess is "evolution." Game development:

```
orange -> cold.
run -> cold
talk -> cold
revolution -> hot
revolver -> warm
inflation -> warm
deflate -> cold
```

So far, we have done nothing but apply mutation, although intelligently to know what is good and what is not. Having gathered information we can recombine the elements that serve. The most useful word is "revolution." As "inflation" also works, we postulate that "tion" is something important. At the same time, "revolution" and "revolver" are both good, we conclude that "revol" or "revolu" something good must have. Therefore, we recombine "revolu" with "tion" to get "revolution" that we already know that is not perfect. So, we mutated it. We answer:

```
devolution -> hot
evolution -> perfect (game finished successfully).
```

EXERCISE: Get a partner and with paper and pencil play the game "guess-guesser" and report the development indicating where mutation or recombination are applied.

9. When a human being participates in the guess-guesser game, he or she has access to his or her knowledge of the language, to common sense, to indigenous malice and her feminine intuition. Is it God who replaces these agents in biological evolution?

The Evolutionary Theory has changed over time. In Darwin's original formulation there is neither intuition nor common sense but there was God who created a few species, perhaps some very simple protozoa, which later evolved and evolved until they reached us. But today God does not appear in Science because, according to it, God is redundant because nature explains itself.

EXAMPLE: If the evidence, smelling of chocolate and having the face smeared, indicates that little John is responsible for the disappearance of the piece of cake, there is no reason to call his little sister on trial. Likewise, according to science, all the evidence points to the fact that matter is responsible for everything that happens in this world and, therefore, there is no need to speak of God at all. Indeed, now everything is harmonized within a great process that began with the Big Bang and subsequent events that were triggered by the laws of the matter. Concerning

living beings, what happens is that by repetition and repetition chance is producing all kinds of variants, some suitable for survival and reproduction and others not. Those that are suitable reproduce better than those that are not. Perfection and diversity appear over time and generations. As you can see, it is not that science is against God: there is no reason to bother him (for Science, it is irrelevant whether God exists or not because, according to it, God has nothing to do with us or with our world).

EXAMPLE: To understand what Darwinism means, let's play the variant of the guess-guesser game in which we replace the guesser with a dice that has neither common sense nor intuition. To make the game easy, instead of using words, numbers with the digits 1 through 6 are used. Let's start.

Let's guess the number 56 by throwing a pair of dice and over a population of 6 individuals. The rule for the judge is:

Cold: if the first digit is not 5, nor is the second one 6. Ex: 43 (cold), 21 (cold).
Hot: if the first digit is 5 or the second is 6 but not both. Ex: 46 (hot), 51 (hot).
Perfect: if the first digit is 5 and the second is 6. Ex: 56 (perfect).

We now generate 6 two-digit numbers by rolling the two dice. The one that falls to my left gives the first figure and the one on the right the second.

First attempt, zero or initial generation:

23 (cold), 12 (cold), 34 (cold), 52 (hot), 43 (cold), 24 (cold)

We run reproduction by merits: We select the 52 (hot) and for being the fitter, we reproduce it 6 times:

52, 52, 52, 52, 52, 52.

We subject the newly reproduced population to random mutation. We can produce a single mutation for each new individual. To decide which figure we mutate, we roll one dice. If it falls odd, we mutate the first figure. If it falls even, we mutate the second.

Let us begin: Let us take the first 52. Roll the dice: it fell 3. Since 3 is odd, we can change the first figure, 5. To know the new value, we roll a dice, it fell 2. Therefore, we change 5 to 2 and there is a new individual, 22. We repeat the same over the other 5 numbers. Upon completion, the 6 new individuals are:

22, 54, 51, 32, 55, 12.

Now we submit the new population (reproduced and mutated) to random recombination. To decide which the first one should recombine with, we roll a dice. It fell 1: the first individual recombines with himself and gives himself. To find the couple of the second number we roll a dice. It fell 4. Therefore there is recombination between 54 and 32. Recombination gives us 52. And so on with the other 4 numbers of 2 digits. We finish with the following population:

22, 52, 55, 34, 52, 22 which is generation one. We submit it to trial:

22 (cold), 52 (hot), 55 (hot), 34 (cold), 52 (hot), 22 (cold)

To obtain the second generation we repeat the whole process once more:

The individuals to reproduce are the hot ones: 52, 55 and 52, in equal conditions. The 52 is repeated but they are not the same but they are different clones with the same information, they are like twins.

With the numbers 52, 55 and 52 we have to form a new population of 6 individuals. To know which to reproduce, we roll a dice. If 1 falls, the first individual becomes part of the new population. If 2 falls, the second. If 3 falls, the third. If neither 1 nor 2 nor 3 falls, We repeat rolling the dice until someone leaves favored. When you rolled the dice 11 times, the numbers that served were 1, 2, 2, 2, 2, 3. Therefore, we reproduce the first one once, the second four times and the third one once.

The new population is, therefore:

52, 55, 55, 55, 55, 52.

Mutation Effect: 52, 54, 55, 65, 56, 12.

Effect of recombination:

55, 56, 55, 66, 52, 14.

Assessment:

55 (hot), 56 (perfect), 55 (hot), 66 (hot), 52 (hot), 14 (cold). Conclusion: Happy ending, 56 was guessed.

EXERCISE: Use random evolution to guess the number 41 and report the development. Use a pair of dice as a random digit generator.

INTRIGUE: We have used the following algorithm or recipe in the example:

1. Random generation of the initial population.
2. Assessment of each individual and reproduction on merits.
3. Mutation.
4. Recombination.
5. Repeat steps 2, 3 and 4 until the problem is resolved (or prove that it cannot be done).

What will happen if we run the evolutionary algorithm by changing the order, say, of mutation and recombination? Which variant will be more natural? Which will be more powerful, that is, more effective?

10. To us, it sounds very different a game with two numbers or with words of 9 letters than another with hundreds or thousands of letters. Is this important in Biology?

It's very important. After all, our organisms are not simple.

EXAMPLE: Investigating on the Internet we find that the human genome, the set of all human DNA, has more than 3000 million letters.

EXERCISE: Research on the Internet how many letters the genomes of your favorite living beings have, such as the dog, the cat, the whale, the chicken, the corn, the wheat.

11. Apart from God, who else could play the guess-guesser game with a million letters or more to reproduce, say, the DNA of a dog?

We can try it. Let's see it. The description of the evolutionary process given by molecular biology is very clear and simple: evolution is the result of mutations and recombinations in the DNA to test them to see how they work. As we may have noticed, DNA has nothing special apart from being the means to transmit information and to allow both mutation and recombination to exist. Therefore, more important than DNA itself, information is what matters, and it is precisely to process it that the computers were created. We can, therefore, stop believing in evolution as a dogma and simulate it on a computer, which offers us a laboratory where you can measure and control absolutely everything. But in which programming language? Java has been my choice, which is a language that due to its many virtues has been one of the favorites in the industry for the last almost 30 years. Nevertheless, it evolves in great steps and this a terrible problem because it keeps the old language shoulder to shoulder with the new. So, Java has ended up being a Frankenstein that is not pretty to everyone. So it is a good idea to consider modern proposals and there are many. For example, for 2019 we have: Processing and Kotlin that are both from the Java family, Rust which is a safe language and designed to be loved, Dart for those who think about productivity, Javascript - an old but excellent language - for those who want to make programs that can be easily run in the cell phone.

12. Have you simulated evolution in a computer by solving the guess-guesser game?

Yes. We have a Java program, which simulates the game on a pair of dice to guess 2-digit keys.

*** Program *** GuessGuesser.java

EXAMPLE: To understand how the program works, you have to keep in mind that Java counts from 0 1 2 . . .

1.2. SIMULATIONS

11

SIMULATION OF THE GAME GUESS-GUESSER
TASK: GUESS A NUMERIC KEY WITH 2 DIGITS

THE KEY IS 16

INITIAL POPULATION =
61 25 43 66 32 52

Assessment
by the number of matching sites.
key = 16 indiv = 61 award = 0
key = 16 indiv = 25 award = 0
key = 16 indiv = 43 award = 0
key = 16 indiv = 66 award = 1
key = 16 indiv = 32 award = 0
key = 16 indiv = 52 award = 0
List of reproducibles
66

GENERATION = 1
by random sampling of reproducibles.
0 -> 66
0 -> 66
0 -> 66
0 -> 66
0 -> 66
0 -> 66

MUTATION
One site is chosen and mutated at random.
66-> 56; dice = 0; position = 0; new value = 5
66-> 16; dice = 4; position = 0; new value = 1
66-> 64; dice = 5; position = 1; new value = 4
66-> 65; dice = 1; position = 1; new value = 5
66-> 65; dice = 5; position = 1; new value = 5

```
66-> 16; dice = 2; position = 0; new value = 1
```

RECOMBINATION

Each individual is recombined with someone chosen at random

```
56 + 16(Dice = 1)-> 56
```

```
16 + 56(Dice = 0)-> 16
```

```
64 + 56(Dice = 0)-> 66
```

```
65 + 16(Dice = 5)-> 66
```

```
65 + 56(Dice = 0)-> 66
```

```
16 + 16(Dice = 1)-> 16
```

Assessment

by the number of matching sites.

```
key = 16 indiv = 56 award = 1
```

```
key = 16 indiv = 16 award = 2
```

THE KEY WAS GUESSED

```
key = 16 indiv = 66 award = 1
```

```
key = 16 indiv = 66 award = 1
```

```
key = 16 indiv = 66 award = 1
```

```
key = 16 indiv = 16 award = 2
```

THE KEY WAS GUESSED

Key = 16.

Number of digits = 2.

Guessed by Evolution:

Award is according to the number of matched sites.

Individuals per generation = 6

Number of generations = 1

Cost in trials = $6 \times (1 + 1) = 12$.

We also have another program that is a generalization to guess keys of any number of digits:

```
*** Program *** AdivinaAdivinadorCualquierClave.java
```

13. What do you find in your simulations concerning the complexity problem associated with long texts?

By looking at the output of the following program one can conclude that evolution can guess one letter per generation.

*** Program *** Shakespeare.java.

If one looks better, conclusions get complex. Anyway, it is not uncommon for one to see here that evolution is guessing a new letter for each new generation.

If biological evolution proceeded in a manner comparable to this simulation, it would have required some 3 billion generations to explain our genetic information. If each generation needed a year, we would have plenty of time because the earth, according to the Big Bang theory, is 4,500 million years old. But maybe we are belittling the power of evolution because the earth is very extensive and there would be many work fronts that could be recombined over time.

EXAMPLE: Humans reproduce every 15 years. The flies every 10 days in the breeding season for about 3 months and little or nothing at other times. In general, the time of a generation of higher organisms is counted in years.

EXERCISE: Inquire how long a generation lasts in bacteria. In the light of the guess-guesser game and your estimation, decide if it makes sense to say that on average the generation time along the evolutionary process is half an hour.

14. You said: One can conclude that evolution can guess one letter per generation. Is your assertion valid without restrictions or only within a certain range?

It is verified as something that happens with certain frequency and only for small sequences. Let me be sincere. One runs the program for an example with 30 letters, then with 35. One realizes that larger populations are needed and that is all to it. Nothing to do with sequences with billions of letters, not even hundreds. Many years ago I was able to run a simulation for a whole month. But now I stop after some 10 or 12 hours of CPU. In that range of experimentation, 30 is already too large a number for many problems.

EXAMPLE: We can understand the importance of validity ranges by comparing them with the operating ranges. To do this, let's think about the problem of maintaining people's health. In youth, health is wasted because self-healing systems work perfectly. But in old age, such systems are broken and maintaining half-health costs a lot and its cost grows with age. As medicine advances, everyone wants their services. Consequently, the cost of maintaining the health of the old men will tend to overflow and there will be no health system to support it. We will all feel the impact of this trend because insurers to try to grab and maintain customers will be forced to use all kinds of traps, such as charging a little price for inscription to next increase monthly payments and co-payments perhaps exorbitantly.

EXERCISE: Research on advances in the fight against aging. Can aging and death be annulled or only delayed? What is the role of health's care? What is the role of genetics? What is the role of somatic mutations, which occur in our cells and their organelles?

EXERCISE: The longer the life the highest the probability of reproducing. Therefore, we have a prediction of the Evolutionary Theory: *aging must be delayed more and more and this must be a tendency in all species but especially among humans* for which there is an extra help: the problem of lengthening life is surely the one that has been most attacked throughout the world and for all times. How true is the prediction of the Evolutionary Theory?

15. Given that your simulations handle only small sequences, is it wise to conclude that they are useless to support the Evolutionary Theory?

If you have defined your role as a spectator, your conclusion is appropriate. But if you feel tempted to be an expert, what counts for you is not the partial answers but the questions that challenge you to work hard and wisely. In that case, you have the advantage of having adequate teaching material, which you can find in abundance at <http://www.ejristos.com>. In any case, what you will say as an expert will also be tentative, no matter how much you want to sophisticate it. However, these questions never have threatened the faith of experts who believe in evolution. The reason? The situation is something similar to multiplication. One has never multiplied numbers with more than 5 figures. And yet, one has faith that the method we use will also work for numbers with one billion figures. But perhaps such extrapolation sounds bad to you because you feel that the paper of the whole earth will be insufficient for such a multiplication. In that case, you need to work in mathematical models that extrapolate behaviors to infinity. Such models would have to involve the following discussion:

Mutation can happen in each letter, therefore, the more are the letters the higher is the probability of changing. Change helps when something better is needed. But the change of something that is already very good maybe harmful. Managing these problems demands resources, more memory, more computing time.

16. You speak of the faith of the experts. Do you mean that evolution is a religion?

Your question is too hot. It could melt us but it is inevitable.

EXAMPLE: About religion, I have seen that many of my Christian brothers believe in evolution. For me that is amazing since religion preaches the fear of God while evolution shows that matter is self-sufficient (which implies that God

is redundant). However, things are not that simple and the following observation could give a light into the sociology of the problem. For us, Christians, it is a command to seek the wisdom from above. This means aligning the heart to the fear of offending God and then thinking at the same time of asking for advice. This is precisely evolution: first, the type of objective and ethical constraints are defined. Then, *to think* means to make a try, then another and another to finally choose the best one. Here are mutation and selection. And *asking for advice* means recombining what one believes with what others believe. That is, in the ordinary exercise of the search for wisdom is mutation, recombination and the selection of the best. Gathering everything we get a full fledged representation of evolution.

EXERCISE: Choose a religion other than Christianity and investigate if it includes evolution. Help: A good candidate would be Hinduism, which has many variants. Can you prove that every religion must include evolution to be worth attention?

17. Your simulations help skeptics to understand the faith of scientists. But, they believe in such extremely complicated things and do not need a god to think and rethink them and to try here and there, such as the gods of Popol Vuh did. But the margin of doubt that remains is gigantic. Do you have a pill that can help?

Yes. I will show you how real and important evolution is to you. Pay attention: You are alive amid legions of enemies who do their best to kill you. These are very varied species of microorganisms that are even in the air and that enter and leave your lungs while some remain in the alveoli. What does keep you alive, calm, and safe amid so much danger? Your immune system, which is no less complicated than the most advanced security systems of companies, governments or countries. But because specific enemies demand specific defenses, one might think that defenses against each microorganism need to be encoded somewhere. Well, no:

Instead of memory, there is a bank of elementary blocks, which are randomly recombined in hemoglobins and then tested on combat fronts. If something works, it continues to be produced and perfected, otherwise, its production is stopped. We can say that the immune system uses evolution as a creative tool. So evolution is the most tangible reality to which you owe your life, your health, and your peace at every moment.

EXAMPLE: Every defense system has its Achilles heel and moreover it can turn against itself. Concerning the immune system, we have autoimmune diseases, among which is a type of diabetes caused when the immune system poisons the

mechanism responsible for glucose transport. Although different people's immune systems are different, some weaknesses are common to many people. When a microorganism hits an Achilles heel, a pandemic occurs. But as we are so many and so different, it seems that mortality does not overcome 30% of the population at risk, which today can be the entire world. And on the other hand, microorganisms also evolve. Its evolution is so effective that it is winning the fight to the large multinational antibiotic companies. That means that the peace and security of everyone hang exclusively on the performance of the immune system itself. This, in turn, is influenced by the nervous system, which in turn is sensitive to the mental state. So, let me remind you: he who is afraid of death puts himself at risk of ceasing to enjoy life. So, if you believe in God, thank him at all times because each moment of life is a mysterious gift.

EXERCISE: Some scientists may feel insulted if they are told that science is a religion. The reason is that their faith is not blind, instead, it is created and sustained on a wide network of observations, experiments, and technological applications. With molecular biology, it is impressive that its objects of study cover from the molecular to the planetary system. One such object is DNA, which is a molecule whose atoms are so small that 10 million of them are needed to form a row one millimeter long. Atoms are grouped into molecules that are used to encode a letter, A, G, T, C. These letters can be about 10 times longer than an atom. Consequently, a chromosome with 5 million letters can measure more than one millimeter. The proof? Photographs of such chromosomes have been known for decades and the science of the atomic has been developing rapidly. To see it, investigate the following topics: tunnel microscope and specific manipulation of atoms, DNA computers, DNA memories, molecular motors, microbots, and microbotics.

1.3 Let's talk about species:

18. The Evolutionary Theory was invented to explain the general emergence of species and that of man in particular. How do you define a species?

One classifies the dog and the cat as different species. We do that by instinct. Operatively encoding the instinct is a task that we owe to Linnaeus around 1740. His idea was to classify the species taking into account whether or not it had characters that he chose according to his wisdom. For example, if it had round eyes or not, whether or not it stuck out his tongue when running. But things are very different in modern biology: *nothing in current biology makes sense if not in the light of evolution*. Consequently, we say that a species is a group of organisms that can interbreed only among them and excluding others. As they can reproduce

among themselves, they can evolve. That is what matters to us since the German biologist Ernst Walter Mayr taught it to us in 1942. When in natural conditions the individuals do not interbreed, such as the hyena and the lion, or if offspring cannot reproduce, the case of the donkey and the mare, we have different species.

EXAMPLE: the cow with the bull and her calves belong to the *Bos taurus* species.

EXERCISE: Find out if the zebu and bison (American buffalo) are species other than cows. That is, if they can interbreed and if their progeny is fertile.

EXAMPLE: A shark population has been found in the Gulf of Mexico that everyone thought was a single species. But by studying random crossings, 4 different evolutionary species were discovered.

INTRIGUE: Five centuries ago, the Spaniards interbred with our aboriginal mothers, and from there, our grandparents were born. This is amazing for the following reason: on the one hand, the European and American lineages lived during thousands of years apart at distances of 7,000 kilometers and more. But in contrast, in Hawaii, there have been more than a thousand species of flies that arose in a not very large archipelago and in islands that were recently created by a volcanic chain. The question then arises: Why are there abundant species on one side and nothing on the other?

EXERCISE: Research on the Internet about lemurs. There are many species among them and some may seem scary caricatures of humans, so much so that in ancient Rome they were taken as spirits of death. In contrast, for evolutionists, lemurs demonstrate that humanoid traits have a very long evolutionary history and that, thanks to that, a change in the genome of 5% was enough to turn a chimpanzee into a human.

EXERCISE: There is a vast coincidence between the taxonomy of the species proposed by Linnaeus and that resulting from the measurement of differences in genetic texts and both are compatible with what reproductive isolation gives. Is that coincidence a clear demonstration of evolution? Propose some arguments in favor and others against. Would you dare to propose a final decision?

19. Are there in your simulations emergence of species?

No.

20. That is shameful. Isn't it?

No. Once you understand how to do it, it is immediate.

21. Could you tell us how to program the speciation?

As for our simulation of the Guess-Guesser game, everything can interbreed with everything. Therefore, there is only one species and evolution cannot produce new species. But we could make possible the emergence of species following the sea urchin strategy:

It turns out that this ball of thorns moves little and it has been found that there are several species close to each other. That has been explained as follows: for a new organism to appear, the sperm must fertilize the ovum to provide its DNA. But the egg is not like a plastic pump, one of those used to inflate and decorate the holidays. It is more like a fortress whose many doors have a password. If the identification of the sperm matches the password, the door opens and the sperm can enter, otherwise, the egg remains closed. By mutation, the password to the ovule changes and also the identity of the sperm. But by pure chance, the changes may be coincident and the mutant sperm may have the new password to the mutant egg. For every coincidence in the mutation, we have a new species. Members of the same species can interbreed with each other, those of different species cannot. Therefore, to create the possibility of speciation, it suffices to define a password and an identity. But there are more possibilities.

EXAMPLE: As for the problem of the guess-guesser game, one could define many species: those that guess even numbers, odd, multiples of 7, of 13, those that guess words with a reduced alphabet of 10 letters, those that guess words that end in a consonant, those that do it in vowel. And so on for thousands and thousands of options all based on the key-identity system.

EXERCISE: Men are unable to start a family with a random woman and women could be even more sensitive. The possible barriers that prevent us from free cross-linking have very diverse origins. For example, we need congruence of habits concerning the time of getting up, and going to bed and how to enjoy free time. Describe what your barriers are like. Help: consider social classes, castes, religions, customs, and habits. Would you say that the human being is a cultural being and that therefore the evolutionary definition of species falls short because cultural barriers are in the long run as effective as the genetic ones? Does this predict that humans must have too many species?

22. The evolutionary definition of species seems very artificial because here you can see neither the enormous complexity of the mouse nor its many differences with the cat. Why does the evolutionary definition of species ignore something so important? Linnaeus seems much more consistent.

Both the cat and the mouse and any other species are considered evolutionary accidents. That means that, according to evolutionists, if the history of the earth could be repeated, it would be useless to wait for the cat or mouse to come out again. Different species would come out. And evolutionists who have not digested this article would expect that the new species that emerge will be equally complex and beautiful like the ones we see around us. So, the great treasure of Evolutionary Theory is that if something is capable of changing and competing, it can begin to change and can put itself in a process towards perfection and excellence. And be more and more successful.

23. That sounds like a philosophy!

Indeed, evolution defines the *natural philosophy* that has immediate applications to daily life and even to death. According to the person, it can be a competition-oriented philosophy (a bias towards Darwinism), or towards self-realization (more towards Mendel's side and molecular biology). The first encourages one to crush the competitor, the enemy. So, you must evolve your weapons towards perfection. The other is an invitation to work on oneself: *make changes on your own, take ownership of ideas and experiences of others, and put them into practice, look to see what effects you notice, and preferably take the best but not exclusively. And keep in mind that your creative way of attacking your problems will make you unique in the universe. You will be a new and unique species. Teach others your winning methods so that your memes or ideas get reproduced to conquer the world.*

EXAMPLE: In addition to being a scientific theory and a philosophy, evolution is also an economic theory called free market and neoliberalism. Evolution says in that area: the distribution of profits must be based on merit so that the best one thrives. But it happens that to compete you have to investigate, but research costs a lot and only large companies have the necessary wealth and/or access to the high credits required. Now, what is the role of research? To find new solutions and improve them, muting and recombining them with the existing ones. We see that the free market is pure evolution at the service of power.

EXERCISE: The free market (pure evolution in the market of goods and services) predicts the happiness of the people because it produces excellent services, magnificent products, and everything at a lower and lower cost. But the reality is quite far from predictions. For example, monopolies are commonplace in a free market economy because the big fish eat the small ones. And on top of that, corruption is inevitable because the money buys some hearts, but a lot of money buys almost all. Could you find the equivalent in biology? Hint 1: argue the monopolistic role of man as king of the universe. Is this monopoly perverse? Hint 2:

Regarding corruption, consider antibiotics and how they misrepresent the victory of the fittest. Are antibiotics, medicines, and genetic engineering corrupting the species and are we gradually degenerating?

IN MEMORIAM: Evolution speaks of life and speaks of death. In our simulations the way to die is very clean and very aesthetic: the best reproduce and the others are not mentioned.

But Darwin's legacy is very different.

Darwin spent decades working on the development of his Evolutionary Theory and in the meantime, he realized in a direct and very painful way that *death is an essential part of life*: the less fit perishes, die, thus freeing resources so that the fittest could continue in their fight for the subsistence. And this was his daily life because infant mortality was high at the time. This is what happened to him:

His beloved daughter Anne Elizabeth "Annie" Darwin fell ill in an epidemic and despite all the care he died at 10 years old. The trauma was so hard for him that he stopped going to the church. His pain was included in his theory: *the fittest reproduce but the least perish, are killed by evolution, without reproducing. Or, biological evolution walks towards perfection, leaving death where it passes.* In Nazi terms we have a doctrine: *death purifies and perfects the species.*

EXERCISE: the death of individuals can be amplified until it becomes the extinction of an entire species. Investigate about species extinctions, their causes, their actuality, and our responsibility.

24. Is there another definition of species that directly begins with complexity?

Tentatively, let us define a Mendelian species as a group of organisms that

- can interbreed only among them and excluding others.
- have exclusive genes (that do not appear in any other organism).

EXAMPLE: the human group is a Mendelian species because our genome has some 60 exclusive genes. These genes participate in functions in the brain and in the testes.

25. Why do you say that this definition is tentative?

Because some of our genes appear in microorganisms but not in the chimp. The problem is that we know very little about the microbes of the soil and so, we do not know if all of our genes are already present in microbes. Nevertheless, it is reasonable to think that specific, distinctive traits, are best implemented by

exclusive genes and not by recombination of others. So, the proposed definition seems sound.

26. Are the two definitions, evolutionary and Mendelian, equivalent?

If you like the evolutionary dogma, they are. If you prefer the scientific method, prepare yourself to work hard and for long time.

1.4 Let us speak about the fuel of evolution

27. How does this engineless thing work?

A car's engine converts gasoline + oxygen into motion. But if we could talk about the engine of evolution, what would become what? The engine of evolution has two parts. The first is time, which is a mystery that allows the existence of changes. The second is mutation, change, the source of biological evolution. But attention, the changes are at random. That means that it is impossible to predict which one will be next. Spontaneous mutations in genetic texts are completely natural, occur randomly, are driven by quantum mechanics and are unstoppable. Due to the so-called tunnel effect, they might happen even in outer space at incredibly low temperatures. Due to such effect, we have molecules of many types in asteroids. Around here among us, the mutation is responsible for the fact that there is always a difference between twins, and that the clone of the cow is not exact to the mother. That is, the clone concept is a technical approach that has nothing to do with exact replication. In general, the mutation is immanent to life as we know it.

Everything happens as in a creek that descends from the mountain: it has the potential to produce energy that is used in a Pelton wheel to move an electric power generator. The equivalent of the wheel is given in biology by the molecular and cellular machinery responsible for reproduction, mutations, and survival in general. Thanks to them, random mutation, which could be the equivalent of energy, is a source of creativity. This only becomes effective if there is an organism that exhibits it and an environment to test it.

EXAMPLE: The biochemical machinery that allows reproduction is tremendously sophisticated. To see it, it is enough to think about one of the tasks to be done. Imagine that you have information saved on a tape. The only problem is that your tape is one hundred thousand kilometers long. You will realize very soon that you have to divide the tape into smaller pieces. But, for other reasons, not so small. Later you will come to the wise conclusion that as long as you don't need it, your tape should be rolled up. But will you think of a robotic system of winding and unrolling, that works well and that does it at the speed of lightning? Such a system

exists in the cell and has, among others, histones, a set of proteins that causes DNA to curl over them. A histone with its rolled DNA forms a nucleosome. These stick to each other and together form a thick thread called chromatin, which is grouped by chromosomes. These threads are so thick that in some cells, such as the salivary glands of the fly, can be seen with a good magnifying glass. Humans have 46 chromosomes, dog 78 and corn 10.

EXERCISE: Research over the length of the minimum genome that allows evolution. This genome should make possible life, reproduction, mutation, and also recombination. This is done by an impressive system and can cause large mutations. Another machinery seeks to correct the copying errors that the mutation causes. Help: You can ask on Google: *minimum genome length*. Be careful if the answer involves genetic engineering, whereby more and more elements of a microorganism are removed until you can no longer live. If you want to be sure that it is a living being with a wide range of survival, ask Google: *smaller bacterial genome*. Would you consider that this minimal genome is so immense that apart from God there is no other explanation? For these types of questions, never accept an answer as definitive because if you study enough you can always question it. So, have no fear of formulating your own opinion. But you should try to argue some logical reason that exposes you to criticism so that you can study more.

28. When talking about the engine of evolution, you emphasized that the changes were random. What is its importance? That is, what would happen if the changes were spontaneous but predictable? For example, it rains spontaneously but not at any time but in the afternoon.

Explaining the incredible variability of species requires an extremely creative source of ideas. Chance is presented as a great option because it never ceases to give surprises. If the changes were predictable, they probably could not be creative enough to explain the many breeds of horses, dogs, and chickens. And we also have to explain why humans are so similar and nevertheless so immensely different. Can that be done without the chance that is included in both the genetic mutation and the ontogenesis, the development from the embryo to the adult?

EXAMPLE: There are mutations that, being random, are transmitted from generation to generation. These are the germline mutations. These mutations allow distinguishing the members of a clan by some bodily characteristics. For example, a young man told me: *I grew up without a dad but one day I saw a man who was going down the street and I realized that he was walking just like me. From that moment I knew he was my dad. Sometime later my mother introduced me to a man and said: this is your father. And he was the very man whom I had thought was my*

dad. Other types of mutations occur in the course of cell divisions of the body that range from the fertilized egg to the adult. These are the somatic mutations, which are not transmitted to children. Skin cancer involves somatic mutations and about 35,000 may be needed to make it effective.

EXAMPLE: Breast cancer usually hits the left side. Although the cause is unknown, several risk factors are accepted such as positive genetic history (with victims of aforementioned cancer), hormonal problems, alcoholism, wearing brassiere that inhibits circulation, not having a varied diet. Therefore, those who wish to take care of themselves should exercise, drink alcohol in moderation, take care of solar radiation and drink the soup.

As for the brassiere, keep in mind that it has nothing to do with sanctity. On the contrary, it was adopted immediately after its invention towards 1950 to cushion the effect of the deterioration due to age and maternity of the collagen structures that support the breasts. So, there is no medical or aesthetic reason for a young woman to wear a brassiere. Instead, all girls should learn to make every day a self-test for early detection of breast cancer because the earlier it is discovered, the better it can be treated. Well, how can we argue that the brassiere is a risk factor for breast cancer? We compare the frequency of breast cancer in two groups of women, some who wear a brassiere and another that doesn't. The frequency in the first group must be greater than in the second, but enough so that all other factors do not have an incidence of weight. As there are so many factors involved, samples from many people are required.

We can clarify two official terms, cause and risk factor, used in the previous example: to show that one has found the cause of something, one has to do the same thing that is done with a light bulb. One says that the cause of the light is a light bulb because when you turn on the bulb there is light and when you turn it off, no. And so it goes through thousands of times until the light bulb is damaged, which one can verify from the change in one of its structures. Likewise, if one wants to argue that, say, breast cancer is caused by genetic factors, one must take all people with the allegedly guilty genes and verify that they acquired cancer. On the other hand, something is a risk factor when it is present in some positives but not often enough to suggest that it is a cause. For example, being overweight is a risk factor in too many diseases but is something serious for osteoarthritis of the knees.

EXERCISE: Investigate the following topic. Ontogenetic development converts a fertilized egg into an individual. It is programmed so that we all have two eyes, a mouth and a nose with two nostrils. Random changes are included along with determinism. These must not be so large that functional perfection is lost or

the anatomy of the species is damaged. But in addition to mutations, there is a fascinating strategy that applies, among others, to the circulatory system. It turns out that the path followed by arteries and veins is not genetically prefixed. What has been programmed is a blood irrigation system that responds by extending its network to where it is needed. That is known by means of CO_2 pressure. Where there is a lot of pressure, the network extends because oxygen is needed there. However, we all have more or less the same architecture of veins in the arms but we all have different architecture within the eyes. The variability there is so high that it allows us to identify a person by their ocular circulatory network.

At the same time, the system is very effective when repairing wounds. Thrombin seals open veins very rapidly. But this is not enough so, the circulatory system creates a new system of capillaries and veins. In that way, one recovers functionality - as much as possible. And the lymphatic vessels are also added to the process, otherwise one would swell because these vessels are the ones that drain the intracellular fluid that is fed by the blood from the arterial capillaries.

And how do you know if a characteristic is due to the ontological development or inheritable genetics? One compares twins. For example, fingerprints have a very high germline component, so much that there have been cases of people convicted of a crime that was committed by their twin brother. The reason is that the guilt criterion is that different persons have different fingerprints. But, attention, experts can differentiate footprints between twins, which allows deducing that there is also a somatic component for this characteristic. However, in China, with 1300 million inhabitants, pairs of people with the same fingerprints have already been reported.

29. Being randomness so important, how is it simulated on the computer?

Ordinary computers cannot produce random numbers. To have such a sophistication, you have to buy a special USB that processes quantum events from a semiconductor. However, a usual computer can generate sequences of almost-random or pseudo-random numbers, whose graph is full of ups and downs of all sizes and that in long distances have low autocorrelation, that is, it is hard for us to predict who will come next.

EXAMPLE: Generating pseudo-random numbers is a sophisticated art. But there are very simple solutions that give the idea. An example is the function

$$y = 4x(1 - x)$$

applied iteratively:

$$\text{If } x = 0.01, y = 4 (0.01) (0.99) = 0.0396.$$

If $x = 0.0396$, $y = 0.15212736$.
And so on.

We can write the sequence generated from 0.01 :

```
0.01 (seed)
0.0396
0.15212736
0.5159385053577217
0.9989838561878475
0.004060445055622244
0.01617583136629007
0.06365669538359767
0.2384180820657501
0.7262996008393574
0.79515396263979
0.6515365533521178
```

We see these numbers scattered throughout the interval (0,1) and it is difficult to predict who will come after a given number.

EXERCISE: Investigate the professional generators of pseudo-random numbers, those that are used for cryptography, which is the art of encoding information that is difficult to decipher unless you have the key that in this case is the seed or the first number of the sequence.

30. Can we see what a random test is like?

To fix ideas, let's think of a dice that has always been the preferred random number generator in games. The first thing we notice is that all players must have the same chance of winning. Modernly we say it so: the probability of each number from one to six is $1/6$. This way of operating is called the uniform distribution over the set from 1 to 6. In modern biology, chance must also be the source of all creativity. More officially: chance must be able to produce all biases at some time but none in the long term. Let's explain what bias means:

EXAMPLE: By erasing the central dot of a die on the face of 5, one can make the die to have two fours and no five. How can we know if a sequence of numbers was generated by this die or by an ordinary one as the generator die cannot be examined? One would have to see the behavior of relative frequencies. For the die to be correct, without bias, the relative frequency of each figure has to tend to $1/6$ and the trend has to be stronger as the game progresses. To test randomness

in simulations something similar should be done, examining both, bias and self-correlation. On the dice without 5, the relative frequencies of 1, 2, 3 and 6 would be $1/6$, that of 4 would be $2/6$ and that of 5 would be zero. With some data, we would begin to see a tendency to go away from the correct distribution that assigns $1/6$ to each case. And by gathering more and more data, the separation would be accentuated. In conclusion: there is bias when the suspicion that the assigned distribution is not fulfilled is strengthened with the gathering of the data.

EXAMPLE: We are interested in knowing if a random number generator has a uniform distribution in the interval $(0,1)$. Uniform means that all intervals of equal length have equal probability. To find it out we have a beautiful test, which we will call the PI-test, which consists of using the generator to find an estimate of the number $PI = \pi = 3.14159265358979$. The error would give us immediately a measure of the non-uniformity of the generator used. The test is like this: Since the area of a circle of radius 1 is π , one of its quadrants has area $\pi/4$. We put the circle at the origin. We notice by Q the area of the portion corresponding to the quarter of the circle that remains in the first quadrant. The area of Q is $\pi/4$. The estimate then comes out of using the numbers given by the generator to calculate the value of Q. If the numbers were randomized with uniform distribution, the answer would be exactly $\pi/4$. It proceeds like this:

We use the pseudo-random number generator with output between 0 and 1. With two such numbers, we have a random point that remains in the first quadrant of the unit circle. We generate 3000 points, calculate the number of points that remain within the Q portion and divide it by 3000, the total number of points. That value should be $\pi/4$. The error gives us a measure of the generator's bias and the effect of sampling, that is, the fact of not having an infinite number of points but only a finite number. Experience shows that it is very difficult to make a good generator that is fast and has no bias or self-correlation.

*** Program *** PI_Test.java

EXERCISE: A characteristic of chance is that it is impossible to predict what will come next. This is tested with a self-correlation test. Research on how to make one and if it is one or if there are many.

EXERCISE: Find out what chaos is and why every good generator of pseudo-random numbers has to be in a chaotic regime, else it would tend to create strong self-correlations.

EXERCISE: Evaluate the following frustration: you can never prove that a generator of numbers produces random numbers. Because it has to have all possible biases but none in the long-range. And it has to be unpredictable. Faced with such frustration, one does a test of adjustment to the proposed distribution and a one-step self-correlation test, that is, between one number and the next.

31. I realize that chance is something very serious. Why is randomness not accepted as the explanation of everything that exists?

Chance is certainly capable of everything but not when needed, and that does not help us considering that the universe has a very limited time in existence. However, randomness is the fuel for evolution, which can produce anything and, according to Science, on time.

32. Let us return to Biology. Are there more mechanisms for the generation of species?

There is one generic mechanism: Different evolutionary paths guarantee, according to Science, speciation in the long-range: species can solve the problem of survival differently thanks to the randomness of mutation. Those that are successful are passed on to the following generations and thus the species are perfected. Moreover, thanks to the randomness of mutation, the divergence of characters appears.

A very direct implementation of this mechanism is to separate a species by a geographical barrier. We talk about parapatric speciation. It is believed that this is common in territories where there are geological changes and, say, in a span of perhaps ten thousand years, a wide and deep river appears, or a high mountain rises that separate the original population into two groups, one on each side of the mountain. This is typically considered as the explanation for rodent speciation.

EXAMPLE: The molecular dynamics of chromosomes can create separatist arrangements. One of them is the inversion of large segments of DNA. When that happens, mutants with the inversion cannot generate viable children when they interbreed with non-mutants. That is, the inversion creates a genetic separation that can give rise to a divergence of other characters. It is proposed that this mechanism is responsible for the divergence of the fruit fly *Drosophila persimilis* and *Drosophila pseudoobscura*.

EXERCISE: Many experiments of DNA hybridization have been done in vitro and it can be generalized that for fertilization to occur, the DNA to be hybridized must have a high degree of matching. Well, there is a very simple mechanism to impair matching and is to insert sequences without special information. Something like inserting commas in a text in Latin letters:

There is a pairing between the following two sequences because A and T are complementary, and the same is valid for G and C:

TATATCGGCTAGCTGACAGAT

ATATAGCCGATCGACTGTCTA

But if we create a lag in the sequence by inserting repetitive elements, the pairing will be lost:

TATATCGGCTAGCTGACAGAT

TATATCGGC ,, ,, ,, ,, TAGCTGACAGAT

Knowing now that repetitive elements create barriers, investigate the role of maize jumping genes and their relationship with repetitive elements. Continue next with the various roles that are attributed to repetitive sequences regarding speciation. And perhaps you would like to read about how multi-objective optimization algorithms have been enriched with these mechanisms.

33. No matter how well it is known how to create barriers and species, the intriguing mystery is the creation of complexity. Can you show us a simulation of genetic separation, which leads to the creation of complexity?

Allow me a detour. Let's start with an observation about your anxiety to see simulations. This anxiety is fair because the simulations clarify the questions and give weight to the answers. In a simulation, one poses the initial conditions, the evolution laws, and the mechanisms for recording and reporting data. But think that the brain can also do the same and that is something very important in science, so much so that it has been given a proper name. In the literature, a simulation in the brain is called a Gedankenexperiment. And, as in a true experiment, if what is believed does not match what is seen, what is believed is wrong and must be changed. When this contradiction is important and there is no way to erase it, it is said that *the theory is false* or that *the theory has been falsified*.

As soon as a theory is destroyed, a better one will be formulated. How are new theories formulated? By evolution, that is, by trial and error: you start by combining and mutating existing theories and looking to see what that gives. But sometimes some data or approaches lead to a revolutionary model. There is no concept of truth. Only survival. But scientists are a mafia who teaches that what they think is the truth. Do not believe them or be afraid of them: a little more and they will not be. Show mercy to them.

EXAMPLE: The last Inca was taught that he was the son of the Sun and that the Sun was God. But he did a Gedankenexperiment in the form of a question: *if the Sun is a god, why doesn't it come out sometimes on one side and sometimes on the other in a surprising way?* He was comparing what is expected of a god with what is seen every day in reality. When he found a clear difference, he rejected

the teaching he received: he was not a god but a human being equal to us. In this, we see that the Inca was much more sensible than Alexander the Great, who heard from the Egyptian Oracle that he was the son of a god, which he believed, and ended up making the army worship him.

All right. Take a deep breath because we are going to run a Gedankenexperiment whose objective is to show that speciation can lead to an increase of complexity.

To inspire us, let's think about hemlock, that plant whose extract they gave to Socrates to prevent him from continuing to corrupt the youth (mainly giving wings to question the status quo). It has several toxic active products and one of them interferes with the flow of chlorine through cell membranes especially in the nerves. The patient ends up dying of respiratory arrest in addition to feeling many unpleasant symptoms. If by genetic engineering we inserted the corresponding genetic information into the human genome, the result would be an embryo that would poison itself. We see that diversification can produce biochemical incompatibility by creating deadly interference. Now, the grossest way to produce interference is to undo what has already been done. That allows us to make a simulation of speciation, which is accompanied by the creation of functional complexity:

It turns out that every cell, like every cell organelle, is a small battery that must always be charged. Cells and organelles can create their potential difference and if they cannot, they die because it is the basic means for ion exchange that is in turn linked to the food input, the output of garbage and the flow of chemical information. Nerve cells are special because they discharge, depolarize, but recharge immediately. And this is used to transmit information.

Imagine now a kind of protocell that if it has the gene in version or allele + produces an ionic channel that pumps hydrogen ions H^+ inwards. If it has its allele or variant - it pumps these ions outwards. If you have + - nothing happens. If you have ++ - it's as if you had - and the pumping happens outwards. And so on. These genes can consist of two parts. The first codes for the pump itself and the second for the direction in which the pump must be inserted into the wall of the cell or organelle. The information for the pump can be the same everywhere but the one that defines the pumping direction has to be different depending on the case.

When the pumps work coherently and the ions accumulate on one side, there is a potential difference between inside and outside. So, H^+ fluxes occur naturally in the power plants of the cells, chloroplasts and mitochondria, although in opposite directions. Chloroplasts feed on light and produce H^+ flows that are then used to create ATP. Something similar happens in mitochondria but they feed on oxygen and glucose derivatives and also produce ATP, among others. What we are doing is proposing a partial evolutionary theory to explain how the ancestors of the

aforementioned organelles could have been formed.

Imagine now that by mutation you can go from + to -, the same as the opposite and that you can change the number of signs of each species, say from + — to + - or +++ —. What will evolution be like in general since the potential is required to be above a certain threshold that, we define, is 3 signs in excess?

To imagine the outcome of evolution, we can reason as follows: pumps are proteins, and therefore it is difficult to make them. They are damaged by reacting with molecules such as glucose (that is why sugar is called a sweet poison), and replacing them costs a lot. Therefore, evolution will favor the economy, and henceforth two species will be created: the first with ++++ exclusively and the second with only —. As the probabilities of the formation of these pure chains are very low, the chance will produce rudimentary structures that evolution will rapidly improve. We see how evolution causes species to emerge and increase complexity.

The problem is that our species can interbreed. But we fix our world if we notice that one of those species is very good in a basic environment, while the other works well in an acid medium. In fact, in a basic environment, there are few protons and therefore it costs little to draw protons towards the medium. On the other hand, in an acidic environment there are many protons, so letting protons go in costs little and maybe they can generate energy. And, without possible exceptions, the two media are separated. We are thus in the field of parapatric speciation: the degree of acidity creates, for these species, ecological barriers that for the evolutionary effect can be as powerful as a genetic barrier.

34. Our culture teaches that the dog is man's best friend. This is called co-adaptation. Can your simulations reproduce the phenomenon?

I have never treated it directly at the level of individuals. However, we see the co-adaptation operating in our simulations when each part of a string is important to obtain the final result. This topic is hot because it deals with questions like the following: what evolves? The genes and each gene separately?, The gene groups?, The individuals?, The clans?, The species separately? The groups of species? The whole biosphere?

EXAMPLE: The human being has many friends but the best of all is the bacteria of the intestinal tract because they prevent infections, produce substances that function as vitamins and that help the immune system. Therefore, antibiotics have an extremely harmful effect. That is why antibiotics create slavery, dependence. However, to remedy the situation, the technique of transplant of bacteria is under development. That is not easy: there has been already one dead.

EXAMPLE: The communities of microorganisms that inhabit the soil represent the highest degree of co-adaptation and cannot survive unless they come in a

group of species of mutual aid.

EXERCISE: Analyze the following evolutionary reasoning: We thought that all those societies of micro-organisms that inhabit the soil were several separated species. But those are indeed supra-organisms which amount to a resounding proof of the Evolutionary Theory: unicellular and prebiotic development needed some 4000 million years while the entire multicellular phenomenon must fit in about 600 million years. How is that possible being that making a complex organism is much more difficult than making a bacterium? The reason is that bacteria pre-evolved everything, absolutely everything that was needed for multicellular beings and thus they could swiftly evolve. And similarly, prebiotic evolution manufactured everything that was needed for the evolution of unicellular microorganisms.

35. How does evolution know that perfection has been reached, something like me, and that therefore it can stop?

The concepts of perfection and stopping are alien to the mechanism of Darwinian evolution. This mechanism is automatic and unstoppable in living beings. However, the mechanism can produce improvements after improvements. What happens is that the improvements have to fill functions. For example, an improvement increases the number of types of substances that can be digested. Thus, dogs cannot eat calabash' seeds but we and mice can. But if we want the dog to be able to eat them and not having collateral effects, such as smelling like another species, that is more difficult. We can infer that the improvements are less and less likely as perfection is approached. Therefore, the time between one improvement and the next would be increasingly longer. If evolution has achieved something as perfect as you, then we would have the impression that evolution has reached its goal and that it has stopped. Is it worth putting all this to test or is it better to keep it so beautiful as in a dream?

1.5 In hindsight

36. What do you see in retrospective?

That evolution is a reality and that therefore it cannot be said of it what anyone wants, but that everything must be put to test.

37. Isn't that precisely what every scientist claims? Can't you say something more original?

Let me present a conceptualization that fascinates me and that relates genetics to computer science. It has several points. To begin with, let's review a definition:

-A simulation of evolution to solve a specific problem is called *a genetic algorithm*. The idea is to manufacture a world where the one that best solves the proposed problem is also the one that most propagates. The individuals of that world are, in general, strings or sequences of letters. All genetic algorithms work by mutating and recombining sequences to evaluate next how well they work to determine what should be reproduced.

-Let us explain the need for *the genetic code*. All living things work with DNA sequences. How does one know what a sequence says, if it is an enzyme of the liver of the mouse or if it is rather a support protein of the bones of a horse? To know which instruction contains a sequence, we need a key that allows deciphering it. That is why we have a table that says that every 3 letters correspond to an amino acid of a protein. That table is the genetic code.

EXAMPLE: The AUGCUU sequence is an instruction to assemble an ordered chain of 2 links with methionine in the first place and leucine in the second.

The same question is given in genetic algorithms: they all work with sequences. But, what do they mean? What happens is that each genetic algorithm has its genetic code because each one has a table that converts sequences of letters into actions with meaning to solve the proposed problem.

EXAMPLE: The sequence of letters 12345 in a genetic algorithm can mean the number 12345 but in another, it can mean a very different number: the 1 tells us that number has a positive sign (if it had a 0, it would be a negative sign). The 2 says that there are two whole numbers, they would be 34. And therefore, the 5 would be a decimal number. The number would be 34.5. Similarly and in the same algorithm, the sequence of letters 03678 would give represent the number -678.

The same happens with programming languages: You watch a program and say: *Ah! It is in Java*. But someone might not realize that, in reality, such a program in Java is a string of meaningless characters in itself. What makes sense is a table that relates the words of the language to actions that the computer must execute. That table is part of the compilers or interpreters of the language.

- Now a concept: *The genome is software*, that is, a set of algorithms. Indeed: each genome is a set of recipes or algorithms to build a living being from another and to continue life. Very important are the recipes to assemble proteins. Some serve as support in cartilage or hair, and others are enzymes that work as catalysts for chemical reactions, such as those that digest food.

- Life from the computer point of view: *a cell is a robotic entity*. That means that it is operated by software that takes decisions and by a computer that executes them autonomously. The software is the one in your DNA. The programming language of the cell is the same genetic code. The CPU of that robot is the ribosome.

This organelle reads the DNA instructions, uses the genetic code to interpret them and executes them producing peptides to do the planned tasks.

EXERCISE: Research over the ribosome and how it works. What about artificial ribosomes?

EXAMPLE: The genetic code in the cell is written in t-RNA molecules, which are similar to DNA. These molecules have on one side a codon or triplet of letters and on the other an amino acid to be linked to a growing protein. But where do t-RNAs appear from? They are assembled by a family of enzymes: t-RNA-aminoacyl transferases. So it is they that ultimately have the code definition.

EXERCISE: t-RNA-aminoacyl transferase enzymes are encoded by DNA. As DNA can evolve, these enzymes also. And since they contain the genetic code, this must evolve. Find out if our prediction is true.

-One can classify genetic codes or programming languages *by expressive power to represent and solve problems*. The interesting thing is that the path of improvement is bounded: one comes to a language in which all problems can be formulated and resolved. It is said of that language that it has universal computing. Any computer language in the industry, Java, Javascript, C++, Ruby, Swift, Go, have universal computing and therefore are equivalent.

EXAMPLE: When a teacher gives his group of students the task of developing a program that solves a problem that is a little difficult, they all come up with solutions that might be very different from each other. One may well say that the differences are due to dissimilar abstractions, which correspond to incompatible genetic codes. This is one reason why many people develop their programs completely independently, using libraries as little as possible. However, the industry continuously produces ready-to-use blocks or modules that can be inserted in any large project. Those who work on these ideas dream of teaching programming in half an hour.

EXAMPLE: The first DNA computer, designed and implemented by Adleman in 1994, was like an abacus, which had to be handled carefully. Adleman, being an engineer, spent an entire semester studying molecular laboratory biology and thus was able to carry out his project.

-What is evolution? Evolution mutates and recombines sequences of algorithms to create new recipes, new algorithms, to see how they work. That is, *evolution is a software developer*.

-What is the Evolutionary Theory? Now that we know that the genome is software and that evolution is a software developer, we can re-express what the Evolutionary Theory says: *evolution is the software developer that is responsible for all genomes of all species.*

38. To say that evolution can develop software is something serious. I don't believe it before seeing a proof: Have you done it yet?

Yes. I did it on a very small scale. But I would appreciate if you do not ask me how small.

39. Do not worry. Nor will I ask about the medium scale. But, what is the problem with the large scale?

It is inaccessible. The reason is that the number of combinations that must be tested to attack a slightly complex problem would easily take as long as the universe has existed. However, there is a whole discipline that shows results every year and that uses evolution to create software and is called *genetic programming*, proposed towards 1950. It lasted stagnant for about 30 years and to take flight a great boost was needed. It was given by the works by John Koza in 1988. This researcher worked with a supercomputer with 1000 Pentium microprocessors, the most developed of his time. He successfully explored everything on a small scale.

Today's computers and languages, such as those of the Java family, allow us to verify at home the reality of genetic programming. On my website, there is material for beginners. But, beware, doing something other than nonsense is a hard challenge.

EXAMPLE: A programming language with universal computing has much more than 10 words. For example, the genetic code has 64. The Java programming language has 55. But to fix ideas, let's think that a language has only 10 reserved words. Let's see. If a computer program has 1000 words, there would be 10^{1000} possible arrangements that we would have to try to safely find the same code. But you have to keep in mind that there are isofunctional programs, that produce the same output on the same input. If we grant that each program has 10^{500} isofunctional versions, evolution should make about 10^{500} attempts to discover a program that works the same as one given beforehand.

EXERCISE: Propose an estimate of what it would take to make 10^{500} attempts one after another. Compare your answer with the time available: about 10^{15} years since the last big-bang.

40. That is to say, there is no future.

Yes, there is, and it instills fear: the most certain thing is that genetic programming will be combined with neural networks to become the threat we all fear.

41. And why should we expect something fearful of such a union?

Because thinkers have managed to unravel many tricks, not so complicated, that we do to be so intelligent and creative.

EXAMPLE: A simple but effective form of artificial intelligence is a meteorological chart. A lady told me: *When that hill is covered with black clouds, it is going to rain here soon.* This type of correlation allows us to create inferences that simulate human thinking: was the hill covered given that it rained here? We can also add appropriate mathematical models and neural networks, which simulate the work of neurons to learn. On the other hand, evolution is the natural and effective method of every human developer for software design: first, it does something simple that works, and then it adds complications until something complex works, which is purified and perfected as much as possible until it becomes what is desired. By combining neural networks and genetic algorithms, we have an entity that learns and another that thinks. It is a promising combination. It is a tool, like a knife, that can be used for doing as good as bad.

EXAMPLE: The expected cyber apocalypse is all based on computers. Where do they come from? All of them come from the fingers and toes, and from using stones (calculi) to count. The first counting machine is probably the abacus that has existed in different versions over the centuries and in very different cultures. The Inca version is one of the most subtle. The Mayan Calendar is mysteriously mathematical. In Europe, the history of automatic calculation goes back to Pascal, who managed to make a mechanical calculator.

EXERCISE: Research on Watson, an artificial intelligence program proposed by IBM and based on correlations, inferences and neural networks. Its production cost was about 3 million dollars. IBM allows you to clone that program.

42. Do you want to propose any conclusions for this first part?

Yes. With some training, one can see that evolution is everywhere, which is something universal. Not in vain it represents the philosophical axis of modern science and also appears in various religions. In Christianity it appears in a prominent place like this:

In the beginning was the Word, and the Word was with God, and the Word was God. It was in the beginning with God. All things were made by him, and without him nothing that was made was made.

The Word is the one who speaks, the one who mutates, the one who recombines. He creates. The Verb is pure evolution. But, who is the one who suffers from the complexity so that things get well done?

Chapter 2

THE EVOLUTION IS OBVIOUSLY FALSE

2.1 The verdict of the instinct

43. You like evolution a lot. And what you argue in its favor is rather convincing. But one arrives at your website and receives a greeting that says evolution is false. How do you explain that?

My website does not say that evolution is false.

44. How not? It is the cold water that one is thrown as a greeting!

My website does not say that evolution is false. What my website says is that evolution is obviously false. And that is something very different.

45. Please explain yourself.

First, let's highlight and unravel an ambiguity. Evolution refers on the one hand to the biological process thanks to which the genetic information of the children does not match exactly that of their parents. We urgently need that to be true to explain why we are all so different. In that sense, evolution is true. But on the other hand, evolution refers to something very different, the Evolutionary Theory, which says that the genetic changes that best combine with the environment make their carriers reproduce better than others and that this is the cause of the origin and perfection of all species, including that of man. Science can argue that in a thousand ways.

EXAMPLE: It fascinates me to note in favor of the Evolutionary Theory that the same substance that makes human beings feel full also makes mosquitoes feel

full. So, if they taste it, they stop biting. We have discovered a mosquito repellent. For this to be possible, the genes responsible for the sense of fullness need to have a high degree of coincidence in both species. There would be no mystery since, according to the Theory, all living beings have a common ancestor and that is why each pair of species are related. So the Evolutionary Theory is reasonable.

EXERCISE: Because of the cellphone now some humans have one more bone in the ear. Popular literature says that this is an undeniable proof that evolution is real and current. Refute such a claim. Help: research on supernumerary bones.

46. You get ready to argue that evolution is false. But, what have you done so far if not defending evolution as if it were true? Have you fooled me in any way?

Everything I've told you about evolution is true. However, there are two illusions that I could have created.

First: having induced you to think that our simulation of the guess-guesser game has something to do with biology. Actually, it has nothing to do, absolutely nothing. The reason is that our game has a pre-set goal in advance. But according to Darwinian Evolutionary Theory, the evolutionary process has no objective and cannot have it. In Darwinism, things happen without any purpose. Therefore, our simulation and everything we have said can only argue that the Evolutionary Theory is reasonable, not that it is true.

Second: The guess-guesser game is for playing in family, it is an easy game. Now, surely there are many easy problems in biology, such as evolving a new breed of dogs. But most problems in biology are super difficult. Let's just think that in 1980 there were already robots that self-plugged in, but still for today, 2019, the impressive development of robots that play soccer falls short to mimic what a child does. The difference in complexity between our guess-guesser game and the usual problems of biology is abysmal and has the respect of all creators. Therefore and concerning complexity, our game has just a little to do with biology.

EXAMPLE: Biology has the respect of creators for details such as the following: the wings of modern jets end in a vertical flap up. Its purpose is to counteract the currents of turbulence, in a spiral, that form in the wings and that dissipate energy. It happens that those fins are very effective in counteracting turbulence, and thus the energy expenditure is lower. Where did this improvement come from? Of some eagles that handle variable geometry to fly and can bend the tip of the wings upwards. As usual, modern biologists would explain their existence by evolution. But it is immediate to show that they deceive themselves:

If these fins had been invented by evolution, there is a mandatory retro-prediction: there must be a lot of variability and many failed attempts in the fossil record of the

fins. For example, fins that go not up, but down, others that are not born from the tip of the wing but in the middle, others that are born in the body of the bird. Some short and others long, some thick and others thin. And above all, others must be crossed, creating even more turbulence. As none of that is in the fossil record, the Evolutionary Theory is not the explanation for the existence of the aforementioned fins.

EXAMPLE: In the design of mechanical structures that have to withstand stress, those areas where the tension or pressure is greater are reinforced while those that suffer little effort are weakened and even replaced by a hole. The reinforcement is created by increasing the density (less gaps), or the toughness (more cement is added to the sample), or the thickness, or greater triangulation. The architects recognize that this was copied from the human body, which gives immediate examples: the nose has part cartilage and part bone. But the ears are cartilage in its entirety. The bones of babies are cartilage and therefore are unbreakable. Otherwise, they would not even be born alive and, moreover, would kill the mother.

COUNTER-EXAMPLE AND EXERCISE: Contrary to what is expected, the hardest bones in mammals, the most dense, are those that are less pressed or stressed: these are the bones of the ear. Could you explain why? Explain this detail by evolution and then unravel your mistake.

47. Why having or not having goals is something that worries you so much?

For effectiveness. A ship that leaves New York and goes to Hong Kong takes a long time but arrives. But a ship that drifts, if it reaches somewhere, comes in pieces. In evolution, the pieces result from the clash of mediocrity with the barriers of complexity to reach excellence. That means that an inevitable prediction of evolution without teleonomy, without objectives, is mediocrity that consists of partial solutions and an infinite wealth of useless ideas.

48. If the guess-guesser game is not a faithful simulation of biological evolution, how would that simulation acquire biological meaning?

We could make our guess-guesser game something biological as follows: instead of programming by law the reproduction of individuals who are guessing the target, we must simulate a way in which guessing becomes a source of energy and food. For example, individuals are given the task of guessing the address of the place where food and energy are. What is guessed does not come from outside, but from the given environment.

49. And, why doesn't your fixed version prove that the evolution is true?

It, of course, shows that evolution is true but only to the limits that the example implies as such.

50. That is to say, the Evolutionary Theory is partially true but is globally false. How do you intend to prove it?

All that we need is to adopt the appropriate point of view and its falsity becomes evident.

EXAMPLE: A man communicates from a distant city with a rich widow and says: *Mom, I am your son, I was lost but finally I appeared. Look at this picture of me to get convinced.* Indeed, the comparison of the photo with those of the lost young man leads one to think that the one that calls is right. However, the mother replies: *Now, sir; send me a side picture.* After that, the man stopped communicating.

51. And what is that special point of view?

We propose not one, but three: the artistic, the linguistic and the complexity.

2.2 The art in the genome

52. Let's start with the artistic point of view.

To recognize the refined artistic style of your body, look at your left hand: being so schematically simple, it is so useful and direct, and also very powerful. How is that achieved? With many small details and great wisdom. Excuse me if I offend you, but it seems simple to me the leg of a chicken: it has three fingers forward, one back and one canceled as a small trace over the heel. But the hand of the human being, the same as the monkey, the lemur, and the mouse are very different. All are flat but the thumb does not close like the index finger and like the other fingers. Instead, it closes opposite the palm, which, together with the closure of the other fingers, allows a grip that beautifully combines subtlety with strength and which makes it possible that there is a worker near you who plays guitar.

53. But that is precisely what the Evolutionary Theory says, that we have hands because evolution simply took them from the monkey and this one from the lemur.

Your assertion would be very respectable in Darwin's time. But not today. If you want to say such a thing, show it. To understand that, in the following simulation you can see how the external appearance of the chimpanzee's hand is transformed back and forth into the hand of a human.

*** Program *** HandChimpHuman4.java.

54. That is, your simulation of the transformation of the chimpanzee's hand into that of man demonstrates that the Evolutionary Theory is correct.

No, it does not prove it. This simulation represents two things. The first is the modern scientific thinking, in which creativity serves a silly purpose because it drives people to be convinced of appearances. The second says that this is how you have to show things after adopting a serious and wise point of view.

55. What is this point of view?

It is a total mechanismism. A lot of work awaits you but you don't have to start from scratch because there is already too much technology that eases the work. In particular, you can find on my website an introduction to the topic of 3D visual evolution of the skeleton of the hand.

56. Could you be more specific about what would have to be done to simulate a total mechanismism?

Let's take the task of studying the evolution of the hand from the chimpanzee to the man. The first thing we have to do is recognize that the man probably did not descend from the chimpanzee but both descended from a common ancestor. You would have to take the job of rebuilding and evolving it by showing that both the chimpanzee and the man's line are highly probable. Do not be frightened but keep in mind that much has already been achieved in simulation:

- The genetic mechanism of how a gene translates into RNA and how the ribosome assembles a polypeptide.
- The way a polypeptide twists on itself to form an enzyme.
- A cell with its many reactions and physical conditions.
- The human skeleton and its muscles and much of its physiology.
- In relation to morphogenesis, the creation of the biological form, it is known that some genes are related to it and that these genes are the same in very diverse lineages.
- It is also necessary to explain why some living fossils of large fish have not evolved at all since 60 million years ago. I did something about it in a past work that is on my website.

57. But far from suggesting something obvious, what you say is that doubting evolution is for geniuses without anything to be busy.

To intuitively perceive that the Evolutionary Theory is false, simply open and close your left hand. Enjoy it. Perfect. Wonderful. Do not you feel that it is a gift from someone with an exquisite and very demanding taste for design?

58. Well, in addition to subjective poetry, do you have objective facts?

You could compare the clutter on my desk with the relative order within the library on the side. Well, being that I am so messy, it is obvious to me that without a library, without an additional structure, made on purpose, there can be no order. Now look at yourself and decide: Given the ease or difficulty of making a cartoon of your external and internal anatomy, would you say that your body is very entangled given its immense functional complexity? Do you see additional structures whose sole purpose is to keep order, structure?

Let us now compare what is predicted by the Evolutionary Theory with what you see in your own body. Notice that the content of a document in nothing depends on whether it is on a tidy or untidy table. Second, for every way of ordering there are thousands of ways to mess up. Therefore, according to the Evolutionary Theory, the disorder must be the law, and the order the exception. Adding everything, could you grant me that the Evolutionary Theory is obviously false?

EXAMPLE: To create the impressive simplicity of the human body, a design based on the search for optimal packaging by functions was used, which is also very professional. For example, in a muscle, there is a packaging chain that organizes sub-organelles, organelles, cells, myofibrils, muscle fibers, muscle fascicles, skeleton muscles, muscle groups. Too much order, I would say, obsessive. But it seems that everything is needed: the membrane that involves a quadriceps muscle group in the thigh of a friend broke out. Consequently, every time he shrugged his leg, a ball formed that was visible from outside, and the damage accentuated over time. With much displeasure, because he was a superman, he had to go to surgery.

EXAMPLE: the skin is the last packaging of all packages. There is a mutation that causes fetuses to be born without skin. They are born alive. But it was the case of a mother who could not stand to see her baby without skin and immediately that she saw him, she took him by the throat and killed him. And although justice exonerated her, thanks to the concept of experts, she had to drag a great pain as a mother.

59. Do you have any simulation that allows us to understand what you mean by entangled anatomy?

Yes, we have one. It shows muscles, represented by straight segments, randomly placed on the bones of the hand.

*** Program *** MuscleMutationPortable2.java

60. I see the entanglement and disorder but that does not contradict the Evolutionary Theory because our hand is not random, it is an evolved hand. Can you show us how it evolves?

Yes, with pleasure. What you ask for is a 3D simulation in the Hollywood style, to whom we owe this art, and which in the scientific field is called virtual reality. Hard. It is worth a million dollars and you will wait between 5 and 10 years. And I will surely raise the price on the fly because you will not stand the urge to ask for more and more things.

61. Is there a way to reduce costs?

Yes, I have something that if you like it, will allow you to save a million dollars. Since the true hand was too complicated for me, I took the simplest hand of all: the tail of a monkey. Well, I made a simulation in which I asked evolution: how will the relative length of the vertebrae of the tail of a Latin American monkey evolve so, that its grip is maximum? And the simulation responded quickly: the vertebrae must be equally long.

*** Program *** EvolutionOfTail3.java

EXERCISE: Could you test the prediction? Is it true that the vertebrae of a monkey's tail and those of a snake are of equal length?

OBJECTION AND EXERCISE: We are assuming that the length of the vertebrae is evolvable. Proceeding in this way we have believed that the Evolutionary Theory is correct. But the reality is very different: on my website, some results say that the shape of the bones is not evolvable. That means that if you don't like what you have, you can change it for something worse. That bones cannot evolve in all their aspects is something that we need to explain the existence of living fossils. Investigate what they are and how the Evolutionary Theory explains them.

62. You previously challenged me to guess how entangled our human anatomy should be if it had emerged by evolution. Well, I have your answer: our anatomy is super organized because the most organized thrives more. Therefore, the tremendous organization of our anatomy demonstrates that evolution is very effective and that it is the true explanation of our existence. Don't tell me you have any objections!

Your illusions are fake.

EXAMPLE: Ordered structures are very few in relation to the disordered and entangled ones. To see it, let's think about the task of tiling a floor. We prefer squares and rectangles. But evolution could produce millions of disorderly ways of doing so. The aforementioned discrepancy in relative frequencies implies that when optimizing the tiling function to the maximum, the optimum will preferably be messy. That implies that if you want ordered structures, you must include it as an ingredient of the function to be optimized.

63. The truth is that I would like more than good reasons. Is there any simulation that can help us?

Yes. I gave evolution the task of untangling a thread. It is not about tangles with real threads in 3 dimensions. It is a two-dimensional thread that can pass over itself. A tangle-free thread is represented by a normal square. A slightly tangled thread is represented as a quadrilateral with two intersecting sides as if forming an hourglass. To increase the degree of entanglement, we increase the number of sides and let the vertices appear randomly: what one sees is a tangled thread.

EXERCISE: Draw a regular, normal, tangle-free hexagon, and another tangled one that simulates a tangled thread.

64. But how do we tell evolution that the task is to untangle the tangle?

The problem is that evolution looks for survival and nothing else. That is why we assign each individual, in this case to each polygon, a capacity for reproduction in proportion to how untangled it is. Thus, tidy polygons will tend to fill the world. We measure the disentanglement of each polygon in a very natural way: it is the number of crossings of the polygon with itself. The mutation changes the position of the vertices and therefore the number of self-intersections. In that way, the polygon evolves.

*** Program *** PolygonIntersectionsBO_Evo.java

65. And what happened? What happened?

The evolution could untangle without problems the quadrilaterals, and also the random polygons with 5 and 6 sides. With 7 sides the disentangling is no longer clear, let alone for 10, 15 and 20 sides.

With 50-sided polygons generated by chance, evolution produces solutions that are a little better than those proposed by chance, that is, terribly entangled.

66. How many generations did you run your simulations?

Programs for polygons with few sides run very fast, one can run them with populations of 300 individuals for thousands and hundreds of thousands of generations. Thus it is verified that for slight entanglements, evolution not only untangles the thread but keeps it so for all eternity. But for difficult situations, the slowness is felt and, at present, I take decisions about experiments that run for 100, and sometimes 500 generations.

*** Program *** PolygonIntersectionsBO_Evo.java

67. Therefore, you cannot exclude the possibility that, over time, evolution may take a step towards disentanglement.

Yes, I can. The reason is that evolution presents cases in which it leaves its usual entanglement entering the area of order but only to fall back into entanglements. Therefore, we propose the following perspective: in a problem of easy disentanglement for evolution, the probability of getting disentangled is high while the opposite is low. A complex problem is the other way around: the likelihood of getting entangled up is high even if it starts disentangled. As the complexity grows, which is given by the number of sides of the polygons, the probability of falling into entanglements increases. Therefore, we have a retro-prediction: the theory of evolution predicts that if living beings appeared by evolution, there must be a very rich fossil record of entangled structures, malformations and mediocre functions that must be in force in any living organism. But even more: there must be a fossil record that demonstrates sporadic incursions into the world of tidy, ordered structures.

EXERCISE: The arguments presented are intended to prove that evolution produces disordered structures with sporadic exceptions. Maybe our discourse is not so blunt. So, analyze the following objection: since evolution can untangle simple entanglements, the initial order is guaranteed. Ordering adds to order, which may well be very profitable. Therefore, evolution will produce ordered structures, as we see them in every organism, without even having an exception.

68. To recap: How do you explain the surprising failure of evolution?

The reason is that evolution does not see or understand and, therefore, it takes longer to get the foot out of a tangle than to put it into a new one. Just like us, humans.

More operatively, the reason why evolution fails is that the probability of falling or staying in a tangle due to random mutations is much greater than the probability of leaving them.

69. The existing uncertainty burns the brain. It could be that the program is badly done because it does not grant evolution the right to explore all the

possibilities among which are the regular polygons. Or, will it be the fault of the pseudo-random number generator?

In addition to multiple minor errors of coding and style, I have detected that one of our programs has an error that I have no idea how to correct and is that it is wrong about 2% of the time. As for the rest, your concern is completely natural. Actually, it is mandatory because errors of programming are the air that every developer breathes. It is for this reason that as soon as a programmer or developer realizes that the genome is software, capable of being chaotic, it immediately deduces that the Evolutionary Theory is obviously false because he or she asks: Where are the tons of errors that evolution should have done to get to me? And since mistakes are absolutely inevitable, one has to invest a lot of time designing and running tests to make sure that the critical points are fine.

In conclusion, I cannot guarantee that my programs are not free from errors. That is why they are available for you to examine. And I ask you the favor of not thinking that I am pouring dirty water on your head. If you realize, you invest a lot of time in silly things, for example, in social networks. If part of that time is dedicated to programming, something that costs us all a lot of work, and if you do it day after day, you will be very happy asking questions, trying to solve them, asking for help and helping others. I think this is feasible given that there is abundant educational material on my website especially suited for people who do not give up.

70. Tell me honestly: Has the program some imperfection?

No one has to be astonished if there are still errors. Even more, it would be strange if there weren't. Because that is precisely what we are saying: programming errors are inevitable and their correction generates even more errors. That is the reason why the Evolutionary Theory is silly. Its purpose is to explain the origin of the software that gives us life. But it does not take into account the mandatory prediction of mass errors both in the fossil record and in our physiology. However, we have made a huge effort, something that is ordinary in this business, to try to filter programming errors. Therefore, we do not expect anyone to find any important error without having spent months trying to do something better. Nevertheless, to guarantee freedom of criticism, all our programs are in the public domain and are in the *EntrevistaEFP.zip* file. In the Test package, we have put some interactive visual tests that are much more powerful than the usual ones in the industry.

But there is something else you should know:

It turns out that the programs deal with events, which can be many. But some are frequent, others not so much and others are rare. An important part of what is done does not take into account rare events.

EXAMPLE: We have several cases of intentional inaccuracy as the following. To find the area of a randomly generated polygon that self-intersects, we need to know the points of intersection. We assume that the points of intersection are all different from each other. Since everything is generated at random, that can be false, although rarely, less than once per million per couple of lines. But we do not take it into account because it is a rare event. It could even happen that all pairs of segments had the same point of intersection. It could happen. But we don't consider it. If it happened, the program would give false results.

71. Is your disdain for perfectionism part of your personality or does it refer only to the study of evolution?

Because perfection is so terribly expensive for me, anyone could well say that imperfection is part of my personality. However, I consciously apply imperfectionism to evolution.

72. That is something that demands an explanation.

Let me challenge your intelligence with an observation that warns us that perfectionism is an anthropomorphic mania that cannot be imposed on evolution because it has an amazing property. Let's see it in detail:

The engine of evolution is chance. Therefore, evolution is stable to chance. And not only that, evolution is stable in the face of transient or recurring, systematic effects but not very large. What that means is that evolution is tolerant to failures, that may well be of programming, as long as they do not have a notoriously recursive impact as if they were a nagging that never ends.

Therefore, you can work with faulty programming if and only if its effects are neutralized by chance. One knows that there is tolerance because evolution manages to reach the optimum (in reality, because the mutation never goes out, evolution comes close to the optimum and stays wandering around). Tolerance is broken when one does not reach the optimum or when one passes by to explore infinite and not productive worlds.

We have used the fault tolerance of evolution at all times when using pseudo-random number generators instead of random ones. Also, if we had random numbers, we should take an infinite number to guarantee perfection, total accuracy. But we neither have random numbers nor do we work with an infinite number of them. Trying to remedy everything has a high cost, both in code and in time and electricity. So, we all get used to enjoying fault tolerance that is innate to evolution.

However, my harsh reality is a bit more amazing: I have dragged programming errors for a long time in my simulations of evolution, which produce systematic, recurring effects that affect every element of the population and in any generation, and however, evolution works.

EXAMPLE: I intended to design an impartial selection, which assigns each individual a probability of reproduction proportional to their performance. But instead, the result was another type of selection that was biased towards elitism, in which only the best reproduce. And this also works. And that is why evolution tolerated my mistakes. All that implies in general, that there are infinitely many ways to program evolution.

73. Since there are countless ways to program evolution, it is worth asking: What is the best way to program evolution so that you swiftly conquer a higher optimum?

Tournament selection enjoys a lot of prestige. The fundamental idea is to imitate a soccer World Cup qualifier among all the participants. But as for me personally, the only thing I use is to put the reverse brake: the best individual of each generation is selected and copied to the next generation without being mutated nor recombined. That way evolution cannot go back by chance. But the effects are not transcendent. And I think that any other improvement is irrelevant to attack problems of high complexity, but for easy problems and that you have to repeat a lot, all improvements are welcome.

74. In other words, your programming is perfect. Therefore, it is true that evolution is a fallacy.

I invite you to consider another point of view that is less fiery but more prudent. Up to this moment, we have approached the subject assuming that any genetic algorithm is an extensive synonym for evolution. If that were true, there would be no other choice than to declare your conclusion correct, as it were a theorem. But evolution is not simply an operational recipe. Evolution is firstly and foremost an almost religious challenge: *If on one way you could not reach your goal, look for another. Mute and recombine paths. And if all the roads are useless, arrived by parachute.*

75. Well, what have you done to respond to this challenge?

The following observation allows us to create several responses: the internal mechanism of evolution consists of mutation, recombination, performance measurement, reproduction, and recurrence. It is essentially the same no matter how original you try to be. But the way of coupling evolution to problems has no rule. Therefore creativity is plenty of room. As for our problem with entanglements of polygons, we only have used a direct measurement by counting the number of self-intersections. But what will happen if we use indirect methods that produce disentanglement as a side effect? To know it, nothing better than trying out a sim-

ulation.

76. What have you simulated and what have you found?

As an indirect method of detangling, I have used the strategy of young children to untangle a tie. What they do is to open the space to cover as much as possible. Therefore, I put to evolution the task of maximizing the area contained within the polygons. I used the technique of estimating areas that we employed in the Pi test, using random points built on pseudo-random numbers.

```
*** Program *** AreaPolygonRandomPointsEvo.java
```

But in order not to turn this document into a source of endless rhetoric, I also programmed an exact method to find the internal area of the polygons.

```
*** Program *** AreaPolygonTriangulationEvo.java
```

77. What did you find?

That this indirect approach does not raise the probability of disentanglement. Therefore, in the light of this new approach, evolution remains a failure.

It is worth noting that the problem of maximizing the internal area of a polygon is tricky because there are modifications that increase the area but that do not cause disentanglement. So, to untangle you must first decrease the area and take another path.

78. Very good. And what else did you test?

I tested the jumping genes, the big bang and the Rehobot's clock.

79. Tell us about the jumping genes.

Our simulations of evolution are correct incarnations of Darwinism in the light of genetics, which preaches: small changes in genetic texts can accumulate to create wonders. So, evolution is the consistent selection of those changes that represent an improvement. In nature, the selection mechanism is automatic because the best changes make their carriers reproduce more. But our program does not involve the philosophy of jumping genes.

EXERCISE: Research about the discovery of jumping genes or transposons or transposable elements, and its discoverer, Barbara McClintock.

Concerning polygons, the idea of jumping genes is applied as follows:

To generate polygons we generate two random numbers, one for the x coordinate and one for the y coordinate of a random point. The points are queued up in

order of arrival to define a polygon. The vast majority of these turn out to be entangled. What should we do to straighten them and take the form of regular polygons? Exchanging the order, which is equivalent to making jump large portions of code from side to side.

80. Did you make the respective arrangement?

Yes, I tried it on the problem of untangling a thread. It gave nothing.

*** Program *** EntangledPlgEvoJump.java

But I must tell you that there are reports of successful simulations due to this strategy. However, there is no reason to be very optimistic, because the number of ways in which genes can jump is excessive even for a few genes.

EXAMPLE: If we take a genetic instruction consisting of 3 parts, ABC, we can exchange it in 6 ways: ABC, ACB, BAC, BCA, CAB, CBA. If we take 4 genes, we would have 24 options. And in general, n factorial ways. To see how fast the factorial grows, we report some values: 10 factorial is 3.5 million, while 22 factorial is greater than 2×10^{20} . And 100 factorial is greater than 10^{150} .

EXERCISE: We need to consider the permutations that coincide when they are rotated. Example: ABC, BCA, and CAB all represent a triangle with ABC vertices. Do you consider that by including this correction in the calculations there is no longer a danger that the number of possibilities will overflow?

81. You teach us that evolution does not achieve anything if you program it to decrease the number of self-crossings of the polygons. Nor does it give anything if the function to be optimized is to increase the internal area. Can both objectives be programmed at the same time?

Yes, you can. If f is the number of self-crossings, evolution must decrease them. And if g is the area, evolution must increase it. We can program a joint objective if we give evolution the task of maximizing, for example, the linear combination $a(-f) + bg$, with a and b positives. The minus sign of f indicates that if one must minimize f then one can maximize $-f$, which combines well with the task of maximizing g . We could also study a combination of the type $t(-f) + (1-t)g$, with t between 0 and 1. If one wishes to graph, the first version is better.

82. If one horse cannot drag the cart, two can. Was this forecast fulfilled?

No, it was not.

83. Let's look at the third try: Explain to us what is the Big Bang.

Because evolution could not increase the area on its own, we can try to force it to do so: the solution is to program an explosion. I forecasted that the polygons would tend to have a great coverage, a large area because the center of a random polygon would be somewhere near the center of the world. Therefore, for polygons with few sides, the explosion would disentangle the polygon. But for many sides, the disorder would be exported to the edge of the world.

84. And how did you schedule your explosion?

My world is in pixels 400 x 400 on the first quadrant. Its center is at (200, 200). If a vertex of the polygon is at (x, y), we measure its distance to the center. We add over all the vertices and program the evolution to maximize that sum.

```
*** Program *** BigBangEvo.java
```

85. What was the result?

For me, it was very intriguing to see if what I expected would be fulfilled. Well, fulfillment was partial: the disorder went to the edge but not covering the whole world but instead accumulating against a corner.

86. There was no detangling because the area did not grow. Therefore the troika of the three horses (number of crossings, internal area, and Bigbang) should have a good omen. Was it true?

That gave nothing. However, it is necessary to note that balancing the different factors is no less difficult than balancing three true horses. This is a delicate art that I have much to explore. This warning is valid for this example and for all that follows.

```
*** Program *** TroikaEvo.java
```

I felt very disappointed. So I thought that the Bigbang should not be an atomic explosion from a center but an explosion of the geometry, that is, the vertex-vertex distance. That made me think that to untangle the polygons, one should not maximize the distance to the center of the explosion, but the perimeter. But a Gedankenexperiment gave me a very negative response because the perimeter is maximized by placing a vertex on one side and the next one on the other side of the world, which produces cross-links. As there are people who have no experience with such experiments, there is also the corresponding simulation for them.

87. Did you do it?

Yes. It gave nothing. Maximizing the perimeter gave nothing. However, I must clarify that this objective does not work on a finite universe, but it might work on an infinite and expanding one.

Program PerimeterEvo.java

88. Let's now look at the Rehobot's clock. What is it about? What is the meaning of Rehobot?

Rehobot means: *stop contending, instead make more simulations and mathematical models.*

It happens that the problem of detangling that we are dealing with is very easy for a human being. Everyone can verify this by playing with a program that allows oneself to untangle the thread.

*** Program *** PlygnIntrscctnsBntlyOttmnnJavaFxTest.java

When playing with the program one quickly arrives at a simple and effective solution: the vertices of the polygon must appear as the hours of a clock. So, it seemed obligatory to program the evolution so that it looked for to accommodate the vertices of the polygon in that way. I forecasted that this strategy would work for polygons with a low or medium number of vertices. But for polygons with many vertices the mutation would cause each vertex to invade the neighbor's space and therefore cross-links would appear.

89. Was your forecast fulfilled?

Totally.

*** Program *** ClockOfRehobotEvo.java

But I almost can't do the right program: if it wasn't for the security I had in the forecast, programming errors would have devoured me. And as for the ability of evolution to untangle random polygons, what happened was the following: the evolution is very good for clocks with 30 hours or under. But for 35 not, and that even though one helps the clock with an auxiliary objective that minimizes the number of intersections. However, the result was somewhat surprising because I thought that the interior of the polygon would remain clean and that the entanglement would cluster towards the edge. Well, no, it wasn't like that. The interior of the polygon had many vertices and intersections.

90. Is there anything left to add about the possible shortcomings of your programs?

There is a delicate problem when it comes to drawing conclusions that are skeptical-proof: simulations have many parameters, and each of them has a wide range of variability. But I set all the parameters to values that someone might consider arbitrary and I have only moved one: the number of vertices of the polygons. From time to time I also moved the mutation rate.

To avoid a war of opinions, one solution is to make an intelligent tracking worldwide. This would take a long time. I think it is a good job for a well organized community, or for someone who likes supercomputing. Nevertheless, I value my experience and my intuition: there will be essentially nothing new. Now, I am not making a dogma but formulating a workable challenge. And, please, do not forget that Mathematics might provide very clean solutions.

2.3 Now linguistics

91. What contribution does linguistics give us?

It gives us a demonstration of the falsity of evolution that is both professional, clear-cutting, and easily understandable. Let us see:

Linguistics studies texts. Those of genetics have essentially nothing special. Now, there are easily understandable texts. For short sentences, start with the subject, continue with the verb, add the direct complement, next the indirect, and finally the circumstantial. For long texts, organize the ideas in the form of a tree. In contrast, some texts are very difficult to understand: they possibly have all ideas but these are choppy and have many repetitions to paste the clippings. In short: they are entangled.

Let us ask ourselves now: how should the genetics texts be if they were the result of evolution? They should be infinitely entangled because for evolution the only thing that matters is the function and not if their instructions are entangled or not. And also for another reason: it is very easy to produce tangled texts. Any child can. But it is very difficult to write clearly and correctly. It takes a lot, a lot of work on yourself to be able to compose professional texts or programs. In the jargon, the expression *spaguetti soup* is used in reference to the usual, entangled, type of code produced by human developers.

92. And, how are the genetic texts of living beings?

They are tremendously clear and understandable.

EXAMPLE: The clarity of genetic texts is evidenced by seeing how easy it is to manipulate them. Thanks to that, it only took 23 years from the birth of molecular biology to the industrialization of genetic engineering. Indeed, molecular biology was born in 1953 when Francis Crick and James Watson published the DNA double helix structure that clearly explained how information could be passed from parents to children. And on the other hand, the first genetic engineering company, Genentech, was founded in 1976 in San Francisco and initially took the information of somatostatin, a human protein, and pasted it into an E. coli

bacteria to produce it in large quantities and sell it as a remedy for ulcer. It may be caused by nervousness that boosts excessive secretion of hydrochloric acid in the stomach. So much progress in science has a single and simple explanation: genetic texts are infinitely clear. Now: Do you notice any obvious discrepancy between what is expected according to the Evolutionary Theory and what is found in living beings regarding the clarity of genetic texts? Expressed clearly, isn't the Evolutionary Theory obviously false?

93. You emphasize very much the importance of entanglements and their absence. What is that exactly? How to measure the entanglement of a text?

When something is clear, you immediately have something to say. It may be something to add, or something to remove, or something to comment on, something to criticize. In short, a text is clear when it is modifiable or, in our terminology, evolvable. Therefore, to measure the entanglement of a text, we put it to evolve and according to the arisen difficulty, we can say that it is much or little entangled. Now, be careful: all genomes of all living things are highly evolvable. They are so to the point that, for example, the texts that code for a histone can be traced across all genomes of all species. And what is more, one can see how the genetic program that allows a bacterium to digest sugar and produce ATP is also found in our cells although surely something updated, properly changed. That is why the Evolutionary Theory could have been invented from molecular biology by comparing the genetic texts and their functions in the various living beings. In a word: all genomes are clear and evolvable and that is why the Evolutionary Theory still exists today and is accepted ipso facto by all molecular biologists.

94. You just showed me that the Evolutionary Theory is obviously true.

No. I just explained why all molecular biologists believe in Evolutionary Theory as something obvious.

95. But then, why something that seems obviously true is obviously false?

Because it is not enough to elaborate one point of view. A multifolded approach is necessary.

96. I already understood your logic: The genomes are evolvable. And that is the proof that they are not because otherwise, the Evolutionary Theory would be true.

Right. Genomes are evolvable, that is, understandable to a human being. That is why we have been able to do genetic engineering in so a short time. When one sees a genetic text, one can quickly tell whether or not it is the gene for pepsin, an

enzyme that digests peptides, such as meat proteins. One knows where the gene begins and ends, which regions are properly coding for the enzyme, which parts encode for regulatory signals, which areas say that the enzyme must be exported outside the cell that produces them in the stomach, and which strings are flanking regions that facilitate to find the gene so that the enzyme is produced in large quantities at lunchtime.

But on the other hand, each genome has a nucleus that is not evolvable. What does that mean? That the evolutionary process tries modifications, one after another, at every moment, without getting tired, without getting bored, but apart from malformations and dysfunctions, there is very little that it can do. That little bit is, however, transcendent for life and allows us to be all so different, but not too much to such an extent that we have to discriminate against each other.

EXAMPLE: Evolution caused a dog to be born with an inverted hand. The dog was forced to always kept it bent towards the face. It walked in 3 feet, the useful arm has gotten stronger and does not appear to be incapacitated. Observing it and its companions, we could see that dogs do not get depressed because they were born deformed, nor do they discriminate for that reason. Recently, the unpaired hand was removed by surgery.

2.4 Let's move on to complexity.

97. How do you define it?

The word complexity has many meanings. Let's just think of the impressive style of the Mexican Cantiflas, who specialized in speaking as complex as possible to say nothing. Interestingly, Cantiflas does not seem to be the only one in the universe. In biology, the problem is known as the C paradox: some plant genomes seem to be too long compared to much shorter ones that do very similar things.

EXERCISE: Research the genetic differences between wheat and tares. These species are very similar but one has the genome much longer than the other. What is the purpose of all this?

98. With so many possibilities, with which criteria will you choose your definition of complexity?

A complexity model shall be evolutionary since what interests us is to study evolution. To abstract it, we need to think evolutionarily: a population of genetic texts is taken, they are transformed, they are tested, they are reproduced by merit that was gained in the struggle for survival, and the process is repeated. After a

long time, one can link the final result with the initial text by a chain of transformations. So, we can summarize: evolution consists of transformations. When one concatenates or adds transformations to transformations, one ends with a recipe that officially is called an algorithm. In a word, evolution is an algorithm.

Therefore, we propose that our complexity measure must take into account the number and type of transformations and the resources that were necessary for the evolutionary path to take place. We can opt for a simplification: we are only interested in the cost of the final product, which is the multiplication of the number of individuals per generation by the number of generations. The idea of this oversimplification is that if we wanted to repeat the process, we do not exclude that the result changes but we hope that the quality of the final product will remain high and that is what interests us.

99. Thus, your definition of complexity is directly related to computing science.

Yes. Algorithms are the recipes that we later write as programs so, our abstraction is strongly connected to the general theory of algorithms that is the science behind computers. Let's see. On the one hand, we have encoded evolution as an algorithm, as a recipe composed of operations that make changes, transformations, mutations, and recombinations. But, according to the Evolutionary Theory, the final product of this algorithm is the DNA of an organism, a genome. But what is a genome? Every genome is a recipe, an algorithm, to build a living being from others. As current cells have excellent machinery to counteract the mutation, genetic texts evolve very little, but in a transcendent way to create variability. That is why the algorithms of the parents are very similar to those of the children. In the end, it is observed that the tiger's son is painted although his stripes are genuinely personal.

We have explained what our slogan means: *the genome is an algorithm for reproducing and continuing life while evolution is a software developer*. Thanks to this slogan we were able to reformulate the Evolutionary Theory as follows: *the genome is software and evolution is the software developer responsible for the existence of every one of the genomes of all living beings, including that of man*.

100. That seems very abstract. Explain it better.

It is as abstract as real life. Like life itself. Pay attention: a girl is learning to use the knife to peel oranges. What is she doing from our point of view? She is inventing for herself a recipe or algorithm that is very functional against every type of oranges, small, large, yellow, somewhat green oranges, thin-skinned, thick-skinned, hard-skinned, soft-skinned. She moves at all times in the world of algorithm creation, making permanent adjustments that consist of mutations and

recombinations and new beginnings. This is a delicate art whose name we already know: it is genetic programming. It is complex, delicate and important because our entire modern world rests on computer-run algorithms. Not to go too far, each cell phone is an extremely powerful computer with 2, 4, 8, 10 or more cores. Mine has 4.

101. We have seen how the complexity of a task is measured, counting the number of individuals needed to complete the task. Your proposal has two defects. First: since it applies to finished tasks, it is not useful for ongoing evolution. Second: it does not reflect the progress that evolution produces. Is there any remedy?

Yes, there are remedies.

EXAMPLE: There is a way to measure complexity so that it is naturally linked to progress:

A task is easy when jumps of progress happen quickly. Otherwise, it is difficult. More officially, be

d_t = the best performance in generation t .

We say that there is a leap of improvement, of progress, between generation $t - 1$ and t when $d_t - d_{(t-1)} > 0$. There is no progress when $d_t - d_{(t-1)}$ is not positive.

If the progress jump number $s - 1$ occurred in the generation a and s in generation b , the waiting time for jump number s is:

$$T_s = b - a$$

We define the task as easy when the graph of T_s , the waiting time, against s , the jump number, is below a fixed degree polynomial. A task is difficult otherwise. In that case, the curves probably fit an exponential. If not, it could be an exponential of an exponential, which I would say is an extremely demanding task in resources.

EXERCISE: Define when a task is easy or difficult for the following protocol:
 n = the number of individuals in the population, which one assumes constant.
 s_t = number of improvement jumps until generation t . $S_t = (n \times t) / s_t$ = average cost per jump of progress until generation t .

EXERCISE: Invent your measure of complexity. Help: involve the quality of being excellent, because it is independent of the definitions proposed so far.

EXERCISE: The *Theory of Algorithmic Complexity*, which is related to the complexity of the programs or algorithms, has had a vast and continuous develop-

ment. Research about it, and relate its P and NP classes to our definitions of easy and difficult.

102. Your measures of complexity are related to the theory of algorithms, of which our daily life is full. And?

We can understand why life is so difficult: any task involves designing algorithms but not the one that first comes to the mind. Instead, they must have a very wide range of applicability and be very efficient. And that is very difficult, no matter what area of life we are considering. It is so difficult that in the industry it has a name, it is called *know-how*.

On the other hand, a specific algorithm is a verbal recipe in a certain language. An easy algorithm involves easy language, few words, easy handling, and if we run it, the cost of resources is low. When we increase the number of words, the difficulty of operating an algorithm and the cost in resources to run it, increase. We say that complexity increases. When the language allows programming of everything, it is said that it has *universal computing*. That implies that a change of one letter in a program may cause great changes in the output. We say officially: the hallmark of universal computing is the immediate possibility of programming chaos, a resounding change in behavior caused by a tiny change in the code of operation.

EXAMPLE: All our words involve algorithms to give the listener information that, for example, induces feelings on demand. Now, all human languages are chaotic. That implies that with the change of a letter, the opposite of what one had planned can be induced. It is the case of the phrase:

I give you a second chance.
I gave you a second chance.

EXAMPLE: Cooking recipes and liquor mixing are chaotic. That is why it is so difficult to imitate a good taste and that is why restaurants with fame are so distinctive of good taste and excellent tradition. In general, all chemistry is chaotic. That is why it is so challenging to say something professional about the origin of life.

All high-level computing languages, such as Java, are chaotic. In Java we can easily see it:

EXAMPLE: Consider the following two instructions:

```
setX (xx);  
getX ();
```

The first instruction gives the variable X the value xx . The second reads the value of the variable X . If one changes $getX()$ to $setX()$, the compiler fails because

it does not find what value give to X . The same happens if one makes the opposite change.

103. What does the chaoticity of languages, including programming and DNA, imply?

Concerning teaching among humans, the teacher teaches something but the student automatically makes small personal adaptive changes that ultimately produce results not planned by the teacher. The consequence is that education is a utopia and instead everyone educates himself or herself on his or her own. Schools that have applied this are very proud, and parents who understand it suffer much less than those that do not.

Concerning the chaoticity of programming languages, the small-scale implication is that there is no program development without having made many mistakes or, as they are called, bugs. The large-scale prediction is that throughout the development of each project a record of the evolution of perfection must be seen, from incipient solutions, through mediocrity, reaching solutions with quality and climbing with great difficulty towards perfection. All that happens even though humans are very intelligent. However, much progress has been made in the difficult task of producing tools, such as better languages and clever methods, to lessen suffering. That is why people appear pretending that perfection is the rule to follow. But I don't see that that is serious. Rather, what you see is that everyone has a terrible fight with bugs and that we all encourage each other to follow in the battle, for example, by writing how to learn from own mistakes.

EXAMPLE: Programming languages have to survive strong competition for being powerful, safe, friendly and beautiful. The great difficulty of the task implies the enormous diversity of approaches and implementations. Thus, Java has given rise to a family of languages with more than 100 members.

EXERCISE: Research on the algorithmic theory of information and the complexity theory of Kolmogorov. These theories allow us to say that, in general, the cheapest way to know what a program does is to run it.

EXERCISE: Research about validations of programs in Computer Science. This method of producing programs without errors promises to obtain exactly what is required.

104. Are there evolutionary implications?

Yes. Note that the DNA language is also chaotic, as are human languages. Indeed, chaoticity means ample room for instant change, as do warplanes that with their broad wings can quickly change their trajectory in any direction. Now, let's

think about all dog breeds with their variants of size, silhouette, skills, tastes, and weaknesses. Let's add the breeds of horses and chickens. All those races were recently achieved, in a few thousand years. All together implies that the DNA language is immensely chaotic. For that reason, I allow myself to assure that the genetic code or DNA language is the greatest engineering work in the universe: being so simple, it is chaotic, incredibly rich in possibilities.

INTRIGUE: The vast majority of species have the same genetic code. This supports the idea that the usual DNA language is enough to program everything you want. Nevertheless, there are more, about 15. Since they are all very similar, evolutionists believe that their existence is explained by evolution. What worries us at this moment is: suppose we simulate on the usual DNA language a species with a different genetic code, will that simulated species be equally powerful to survive and reproduce?

105. Therefore, the chaoticity of the DNA language is perfect for evolution and hence to explain why it has given rise to so many species with so many differences.

One moment, one moment. You just invented a sophisticated version of the Evolutionary Theory, but is it true?

106. My theory might be true, as can be a sophism. To elucidate it, we must compare its predictions with what is observed in real life.

Right. But with a little salt. There may be thousands of predictions that are true but that does not imply that the theory is. It is the same as the theory that says that all the roses on earth are red. You can bring millions of red roses but nevertheless, your theory is false: a white rose is enough to falsify it.

107. So, what is your white rose that falsifies my theory?

It is the very chaos that is the generator of options at random. Its prediction is immediate. Think of the eyes: in humans, they are in front at an appropriate distance. Is this important? Surely it is because that allows a fine stereoscopic vision, which enables running at high speed over obstacles as using an arrow to kill a remote prey along a parabolic shooting. This is complex. Therefore, it makes sense to propose that this anatomy resulted from evolution, that is, from the recurrent improvement of a random initial condition. Now, it is unlikely that chance has put them there from the beginning and at the proper distance from each other. Therefore, evolution of perfection is mandatory. That means that in the fossil record of mammals or their ancestors there must be populations of skulls with the eyes aside, as in birds, or back as in spiders with 8 eyes, or up or down or oblique because evolution has no idea of what is up, down, left or right. Well, Is it a problem if we find

a population of fossils with one eye on the knee and another on the back? Let's go now to verify our prediction. What do we find? That all humans and all their ancestors have their eyes in the face like us. Therefore, the evolution of the basic positioning of the eyes is missing. Is there a reason why I should not consider Evolutionary Theory to be worthless? Anyway, there is enormous variability in the pupil-pupil distance. This is a fact that remind us that the biological evolution is a reality.

EXERCISE: The eyes of mammals, unlike those of the snail, are inside the eye sockets, which provides them with natural protection. Decide if this is important, develop the evolutionary proposal to explain that protectionism and run an appropriate test to decide if this theory is false. If many critical and diverse tests to falsify a theory fail, the theory is usually declared true. But experts allow themselves to break sociological rules.

108. But chaos, chance, is capable of anything even to do everything perfectly in a single play. Therefore, it is not necessary to look for any eye positioning mutant.

Indeed, that is possible. But it is very rare. It is the same as saying that one is going to win a big lottery by buying it for the first time. Or, by buying it each day during the whole span of our life. By contrast, the postulated merit of evolution is to repeatably use the creativity of randomness to create complex objects. But since evolution is real, it has two mandatory predictions: on the one hand, there will always be bugs, imperfections, and on the other, there will be an evolution of perfection, from the incipient to the mediocre, following with acceptable solutions and going on to scratching perfection. This would be true if there were no limit to resources and in that case, there would be great periods of stagnation before each step towards perfection.

109. You seem very worried by the perfection of living beings. So, how can I detect mediocrity?

Because of the envy we feel when we see someone better than us. All in all, one has a very developed instinct to admire and sometimes desire perfection.

EXAMPLE: One way as bears hunt is to climb to the top of the hillside and start rolling, sticking its head between legs to hit the prey at full speed. To achieve the objective, they have to make very small movements with the trunk to adapt the direction of rolling. Hard. So the bear has its simulation laboratory: in winter it makes snowballs and rolls them. But if the ball is badly made, it may get destroyed in its own hands. It rages in angry, expresses it to evaporate it, and starts over. Until

when? Until it manages to understand that its entire body has to be a coordinated entity that functions as a directed and error safe projectile, regardless of the change in speed or direction of the prey. Until everything goes perfectly by routine.

EXERCISE: The species make quality control when programming the choice of couples. In birds, we have dance rituals, the quality of the nests, the beauty of the plumage. Research the evolutionary explanation of its existence and refute it, if you can.

110. That is, we come with programmed feelings to detect mediocrity. And, how can I objectively detect complexity?

When a task is easy, one works, works and works and achieves it. But when a task is difficult, one works, and works, and maybe something achieves, but not to satisfaction. One gets annoyed at the inability to overcome mediocrity. In hindsight, we can say: when a task is difficult, a mediocrity record remains but when it is easy, there is no trace left. Now, all human life is completely permeated with knowledge that teaches recipes, algorithms. And in general, everything is very difficult.

EXAMPLE: I've been learning to play the keyboard all my life. In the beginning, it was easy and fun. Then not so much, and finally one realizes that leaving the amateur level is for titans with a lot of free time. Also: all men enjoy mechanics. But a friend mocked on my mediocrity by commenting that I suffer by sticking a nail. Almost every day I realize that mediocrity is the usual rule in my life.

Without fear, we can generalize: complexity can be detected by the wide range of mediocrities that most of the proposed solutions have.

EXAMPLE: In my culture, some 16-year-old girls suffer peeling potatoes and cannot do so at the speed required to have lunch on time.

EXERCISE: Tell something about your fight against mediocrity. Can you add quantitative and objective comments?

EXAMPLE: Mediocrity is often a great achievement because sometimes nothing can be done: making a bed has been extremely difficult for robots up to this day. That's why there are human waitresses in hotels where robots reign.

111. Looking at myself, I conclude that there is no complexity for evolution because I do not find mediocrity in my anatomy or my functioning. Therefore, your claims are no falsification of the Evolutionary Theory.

The perfection of your body, form, and functions, is explained by the Great Science using evolution. But since there is no trace of any mediocrity anywhere, evolution would be magical because it doesn't have to sweat to achieve wonders. But according to the truth of what anyone can see both in his or her life and in the simulations, evolution is not magical, but real and it has to sweat fluently to do what you want. What is more, evolution can get caught in a trap of extreme mediocrity from which it condemns itself not to leave.

EXAMPLE: Let us study a problem that being historical is very modern, very current: Carthage, in what is today Tunisia, represented in the second century BC a threat to the hegemony of ancient Rome, so much that they eventually destroyed it after 3 world wars, the so-called Punic Wars. But at first, Carthage and Rome were almost friends. At that time, a Roman general introduced himself and told the Carthaginians: give me a territory that is not larger than what a bull's leather covers. To locals, it seemed so funny that they agreed.

The general took his leather, made a cord as thin as he could, extended it as a fence, and what he enclosed was enough to build a fort. But firstly, he had to decide which figure he should have to maximize the enclosed area. This problem is terribly difficult because it is not known what figure it should be. It could be a triangle, or a square or a 17-sided polygon, a star or what.

The Roman general had no computer, nor could he count on evolution to know the answer. Imagine now that he enters your tent and asks you: *Hey genius, what figure should we form?* You guide him to a mental simulation, a Gedankenexperiment, and respond with the following Ansatz or mental trail, cut way:

If one starts from any fence, one can improve it by expanding it so that it is convex everywhere.

Because if there is a concave segment, one can turn it over its endpoints so that it is convex and the area will be larger. The resulting fence is of the same perimeter but with a greater area. Therefore, the optimal figure is one that can no longer be expanded because it is maximally convex at every point: it is a circle. The general answers: Good, very good. And leaves your tent. But he returns and asks: *We Romans like straight lines and square angles: How much will we lose if I opt for a rectangle?* To which you respond evasively: *opt for a square and it will minimize the loss.* To this the general asserts: *it will be square.* And leaves. Take a deep breath and try to calm down: the cost of changing a circle to a square is high, more than 20%.

Let us now test evolution to see how it battles against such a tremendously difficult problem.

Computers work on discrete elements so, the first thing we do is to recognize

that we cannot work with curves, like a circle, but with polygons. We claim that not much is lost because polygons can approximate circles as much as you want. We describe a polygon by a succession of points in the plane that represent its vertices. We assume that each pair of neighboring points is connected by an edge and that there is another between the last point and the first to close the fence. The polygon can have any number of points. To calculate the enclosed area, we divide the polygon into triangles, calculate the area of each one and add everything to get the total area. But this has been extremely complicated for the general case, even for quadrilaterals. Then we chose to estimate the area by the random points method: the area contained by a fence is proportional to the number of points that remain inside, as we did with the PI-test.

To start the simulation we create an initial population of, say, 4 randomly generated individuals. In our case, individuals are polygons, say, with 8 vertices. We generate random numbers, each pair represents a point, and n pairs of points represent a polygon. It is generation 0.

As we want to maximize the area, we assign a reproductive capacity to each polygon proportional to the area. The higher it is, the greater the probability of reproducing. But what will we do because, at the same time that the area must be maximized, the perimeter must be equal to the length of the string, neither more nor less?

Solution: We assign a punishment that is proportional to the difference between the perimeter and the length of the bull's leather cord that is constant. And we add the two terms, the area and the chastise because of perimeter mismatching, and with the result, we determine the probability of reproduction. In this way, with the passing of the generations, the area will grow and the perimeter will tend to accommodate along the length of the string. This technique can be used to solve all kinds of problems with constraints, including all kinds of equations even for those with no exact mathematical solution, such as finding the roots of a fifth-degree polynomial.

To form generation 1 we reproduce the polygons: we measure the performance of each polygon. The better, the greater the probability that a polygon will be copied to the next generation. We complete the 4 polygons by this method of selection, then we make random changes, mutations, and to simulate recombination, we copy a subset of points followed by a polygon and paste it to another part of another polygon. As we have defined, mutation and recombination are done after selection, so it happens preferably among the best. We repeat the procedure to form generation 2 and so on for some time until evolution stagnates.

112. And what does give your simulation?

For 4-sided polygons, it gives squares (in reality and because the mutation

never fades out, it gives quadrilaterals that blur a square and that spin around in a disorderly way). For 50-sided polygons, evolution does not give anything that resembles a circle. Entangled polygons are the result.

*** Program *** CartagoEvo.java

113. You go in such a hurry that you eat your own mistakes. Your falsification has nothing to do with biology unless you can demonstrate at least that the problem Carthage or bull leather is a problem that biological evolution has to solve. Can you prove it?

Yes, I can. Abstracting, the problem Carthage, that of bull leather, seeks to optimize a function with a restriction. Transposing large portions of code may help. The most appropriate biological problem of this type is ontogenesis, the process of creating an organism from a zygote, a fertilized egg.

Ontogenesis is a genetic program that adds transformations to transformations starting from the zygote until it ends in a wonderful living being. This process has hundreds of types of restrictions, one for each characteristic to be controlled, such as temperature and acidity of the habitat, internal temperature, food to digest, quantity, and type of light to support or assimilate. Additionally, ontogenesis is very jealous of the changes and this is the reason why almost all of us are so perfect: an inappropriate change and everything else is to build on quicksand. The result is an abortion. It has been reported that 80% of pregnancies in human mothers end in abortions and the vast majority occur in the first weeks of pregnancy, when the abortion may not even be noticed by the mother. The only thing she might perceive is that the period is shifted.

EXAMPLE: All persons with Down syndrome are very similar. Let me propose the following explanation: in them, the ontogenetic program is interrupted halfway. As a consequence, only the instructions of the fundamental form, based on a sphere and equal for all humans, are executed, but the information that contains the individual traits is not.

EXAMPLE: The essence of the Carthage problem is to order appropriately a sequence of points, all of which have to do with permutations and translocations. These problems are ubiquitous throughout Biology. Thus, for the artistic point of view, consider a human being project that instead of two eyes has two mouths right there, and instead of a mouth, a great eye right there. This project would be viable, individuals would form societies that in their religion would put as a great sin mixing with mutants like us. For the linguistic point of view, let us think that, in the great majority, the genetic instructions encode for amino acids and the difference is

due to permutations and substitution. And besides, the number of elements is not 5 or 10 but they are counted in thousands, millions and billions. That is, the problems of real biology are infinitely more complicated than the Carthage problem, but in essence, they are the same.

114. Is it correct to conclude that evolution is useless?

It is wrong. Too many examples show that the power of evolution is limited only by our imagination and by the abundance of available resources. The problem is that large-scale resources are needed for everyday problems because evolution stands still in what is called local minimums, that correspond to persistent mediocrities that possibly can be abandoned after long delays. As such problems are also in biology, the prediction of mediocre fossils is inescapable. The tension between the possibilities of evolution and its great hunger for resources has been reflected in a simulation in which some worms have to climb a wall, which represents the rise to perfection. The initial worms have two links and evolution must teach them to move without destroying themselves. The first who succeeds can reproduce and its children have three links, which reflects the fact that evolution can increase complexity. Evolution must also teach these new worms to climb. The first who succeeds can reproduce and its children are born with 4 links. More complex worms need more training to learn to move. Tension appears because the time of such training increases disproportionately as the number of links increases. Now, we ask ourselves: How are fossils in that tense world?

All fossils are mediocre and cannot climb the wall. The perfect ones leave no fossil record. If one did not see them in the current generation, one would not have to believe that they existed. This must be so because for each generation there is only one perfect worm, and all others are imperfect. Everyone dies, but the perfect ones are very few and do not appear in random sampling.

*** Program *** WormsEvoJFXa14.java

115. Although some things seem understandable, all this is very sophisticated. How do you dare to say that it is obvious?

The falsity of the Evolutionary Theory is obvious. What is difficult is to say something logical and objective that supports such an idea. And this seems to be endemic. For instance, the mathematical theory of complexity has unresolved central questions such as the following: Is the extreme complexity of our daily life due to lack of knowledge or is it intrinsic to problems? This thematic uncertainty is seen from genetic algorithms as follows:

There are endless ways to program evolution by changing the cross-linking, mutation, and recombination procedures. It has been shown that some ways are

better than others in some sense. But no one has been able to demonstrate that one can attack a difficult problem and make it easy thanks to some evolutionary technique. So, I am in favor of thinking that evolution is a non-transcendental tool. But, attention, each problem can be encoded in many evolutionary ways, and each problem could be solved by many algorithms indirectly. I favor believing and teaching that there is no limit to the power of indirect methods or the freedom of codification. However, I have never achieved anything in this regard.

As many researchers share my failure, we teach that everything indicates that complexity is objective and intrinsic to problems. However, let's dream a little to capture the opposite view that should not be simple: according to humans, the distance between Earth and Mars is 400 million kilometers. It is equivalent to giving 10000 turns to Planet Earth around its Equator. Going back and forth is a problem whose solution requires months of travel. But what will we do when a Martian appears saying that by reprogramming space-time they can come and return in 3 minutes but that they don't like to do it because they have so deep headaches? Now, let me offer you an incentive to dream:

The problems in our daily life are very difficult and are many. But in a good part, they are like a knot that destroys itself if only one manages to start. Because there is a problem related to our ability to express ourselves, called SAT, that if we solve it easily, then a good part of all the problems in our lives would turn to be easy. But more serious ones could appear: 10% of mid-range jobs would disappear in the first 6 months. And the trend will continue for worse.

EXAMPLE: At 3 years of age every human being has powerful reasons to understand that evolution, our usual technique to solve problems, is obviously false. That is because one already has 3 years of experience in three very difficult learning problems: to move the body, to speak, and to express oneself. We objectively know that it is very difficult to learn to move because programming robots with movement has been very difficult. Learning to speak involves the coordination of about 100 muscles. That great difficulty is reflected in the enormous variability of the solutions, and that is why we all have a different voice, a timbre. And learning to express yourself is something so difficult that it is an eternal struggle but that I lived red hot when I was 40 years old. At that time I found a girl 8 years old that, in my opinion, expressed herself much better than me.

EXERCISE: Estimate the age at which a human being can:

- Know that life is very, very difficult. A child can be heard saying while crying: Why me?
- To be able to admire the wonders.

- Be able to produce mediocre solutions for almost any problem. Keep in mind that the word mediocre comes from the word medium, that is, half of the optimum, or maybe, half of the best-achieved solution. Therefore, a mediocre solution can be a challenge.
- Recognize that one has too many dissatisfactions caused by one's own inability to solve problems. For example, I saw a child under the age of one year desperate for not being able to open a bottle with a screw cap. His dad passed by to the kitchen and opened the bottle. In gratitude, the baby regained calm.
- To be able to discern that leaving mediocrity demands a great effort.
- Admire the human body as a mechanical wonder. It seems to me that this is acquired rather late because the concern of young children is to be loved, to look beautiful, full, well dressed, healthy, tall and strong.
- Unraveling the fact that everything we do to improve goods and services is reduced to making changes, following advice, and evaluating the results. Next, we must recognize that this wise way of life gives one certain success but at the price of applying it repeatedly for a long time. Otherwise and in the meantime, one sees only dissatisfactions, that is, mediocrities. In our language: evolution works but you have to sweat to see its results.
- To unite everything and conclude that a creator with a very high sense of honor and dignity is required to craft something as complex and as wonderful as this world with so many, so diverse and so complex living beings.
- To critically assess the Evolutionary Theory in the face of personal experiences with all sorts of high complexity, which is our ordinary life.

EXERCISE: Research about SAT, its relation with our ordinary life and the complexity of solving it.

EXERCISE: We always struggle for not knowing whether a problem is difficult just for us or for everybody, i.e., if a problem is subjective or objective. Science is not better than us. To understand this, inquire about the NP =? P conundrum that captures the uncertainty of not knowing whether or not complexity (NP) can be reduced to simplicity (P).

116. How much do you pay me if I show you that everything you say and claim has nothing to do with biology? Therefore your falsification of the Evolutionary Theory is a fake illusion. I have two demonstrations.

All the money in the world would not be sufficient to thank you for something so important to me.

117. Okay, I'll tell you it for free so, keep a good remembrance of me. Let's start with something you just said. You said we don't know if complexity is subjective or if it is objective. So, how can you pretend that evolution perceives complexity as something objective?

Because of our daily experience. Indeed, evolution is today a common tool in science and engineering to attack problems. And no one has ever reported that it could solve any problem without having spent the usual resources, in the number of generations and individuals per generation. We can say then that it is a fact that evolution has to sweat it to produce results and that mediocrity besieges it at all times. This kind of experience encourages the hearts of many experts who bias in favor of the thesis that complexity is not only statistical but also objective, intrinsic to problems. However, do not believe the experts but cultivate the doubt. But, in conclusion, it is permissible to say that there is as much truth in the Evolutionary Theory as mediocrity in my body and its functions. Why? because I have too many organs, suborgans, functions and subfunctions.

118. You say that it is permissible to say that the Evolutionary Theory is false. Who do you ask permission from? Do you have any doubts?

The Evolutionary Theory is false with certainty. But there is a doubt in the following: Is the eye, as a perfect organ and without mediocrity in its evolutionary record, sufficient to falsify the Evolutionary Theory, or are more organs needed? The instinct of many people says that the eye is enough. Mine also but with a correction: I do not deny that the anatomical eye is a wonder but, in reality, the neural network responsible for the visual analysis of the image registered by the eyes is the one that seems most amazing to me. I am extremely terrified of its immediate visual recognition. The whole set is what testifies to the greatness of the Creator. But, don't believe me. Not yourself. Instead, make your simulations trying to make evolution create the eye and then make a decision. We clarify that the eye is not a camera:

What you are looking for is a highly intelligent system that tells you that what your eyes are seeing at this precise moment is a message to your intuition. But be careful: the high intelligence of the visual system makes it prey to its greatness: it is the optical effects that sometimes cause us so much trouble. The same goes for any intelligence: each one has its Achilles heel. Each one comes with its poison.

When weighing explanations of the appearance of the eye we combine two factors: the intrinsic complexity of the problem and the role of chance. The problem is that the eye could have been the exception that appeared perfect by pure chance

without having an evolutionary record that shows that there was evolution from a product with incipient visual functions, through mediocrity and then seeking perfection. And maybe there are more exceptions. But chance could not produce endless exceptions because otherwise, it would not be chance but magic.

So I propose a pact: let's make a list of all the organs of all living beings. We explain the first 1000 by chance, they are perfect and without a history of mediocrities. But the others 2000 testify that evolution is false or that chance is magical. In the first case, you would be with me in the same row. In the second, you would be teaming up with Lamarck (Jean-Baptiste Pierre Antoine de Monet, chevalier de Lamarck), a renowned naturalist who long before Darwin invented an Evolutionary Theory in which the motor of the evolutionary process came from alchemist forces of progress towards perfection. Using our jargon: for Lamarck, randomness is magical.

Since alchemy is discredited today, you may be tempted to belittle Lamarck. It is not necessary: if he chose supernatural forces it is because his intuition could not accept natural forces as an explanation of the wonderful complexity of the living kingdom. I agree with him. But on the other hand, Lamarck's vision implies that evolution can be helped. Whether this is true or not is something that worries me a lot. An argument in favor: evolution seeks the optimization of a certain function. Therefore, one already knows where to go. Consequently, there may be a shortcut. Upon finding it, we would be greatly helping evolution. An argument against is the following: although I have made several attempts, I have not found anything worthwhile except for the reverse brake, which is not the great thing. Let's remember:

Evolution goes forward but as chance never stops, sometimes it takes it backward. To avoid that, we select the best individual of each generation and clone it so that it is a mandatory part of the next generation.

119. Let us now examine a mortal objection to your claims. In absolutely everything you say and imply, evolution is used to solve problems. That is, for you, evolution has an objective. But in Darwin's updated theory, evolution has no objective: the mutation happens by chance of quantum mechanics. Complex machinery makes recombination but happens by chance. The selection is made by the environment on their own without anyone in charge. In a word, biological evolution does not have to account for anyone. Therefore, the falsification you propose applies to applied evolution and real-life but not to biological evolution. So, I repeat over and over: your falsification is an illusion.

Actually and being very rigorous, in the Evolutionary Theory there is a function par excellence and it is given from the outside: to survive and reproduce. This

function is implicit in what is needed to implement evolution, that is, in the mechanisms that make possible survival, reproduction, and inheritance. Now, look at the following work of art: it is entitled *The Creole Chicken*.

*** Program *** EIPolloCriollo

You can see how this chicken is running with that air of youthful majesty, with its wings extended and aligned to each other. Look at that hind leg as it strives to make itself felt. It has a very aesthetic beak that says that it is an elite chicken. Who made this work of art? It was made by evolution. I'm going to tell you how.

I programmed evolution to solve the Carthage problem. And since I wrote the function to be optimized incorrectly, it did not give the solution, which is a circle. Instead, it began to give figures like these. On one occasion this drawing came out, and I saw a chicken and I liked it. I loved it. Very much. And now evolution became famous as an artist.

In the jargon it is said: evolution is not teleonomic but diffusive. But the form of diffusion is not spontaneous but self-organized because it follows the response of the environment. As in the case of the Creole chicken, evolution can discover great inventions without even thinking about it. In the jargon of evolutionists, this is called serendipity, in honor of a Persian tale in which three sisters from the country of Serendip, today Sri Lanka, spent their time making discoveries by chance.

This makes me think that an evolution by diffusion, without teleonomy, must be much more creative than an evolution with objectives. So, we ask ourselves: is the world of life creative, that is, absurd, according to us?

Well, not much because I see the biome, the set of all living beings that have DNA, very complicated and very wonderful. However, from time to time something seems absurd.

EXAMPLE: Dobzhansky proposed the following case, in the mid-twentieth century, as something absurd and therefore as proof that God could not have created life: *there are flies in Africa that bite some warlike ants in the abdomen. But the bite is not with the mouth but with the tail and they insert not poison but an egg that grows inside the ant, which remains alive. When the larva turns into a fly, it goes out to repeat its cycle of parasitism.* If it is hard for you to understand Dobzhansky, put yourself in the place of the ant. And don't forget that it is a warrior. But ... who is this sir? It is Theodosius Grygorovych Dobzhansky, a Ukrainian nationalized in the United States, who was a tremendous authority of evolution, and who taught the world to do experiments with the fruit fly instead of speaking so much wording. While he was in full work, he suffered a heart attack, but the next day he returned to his laboratory to continue working. From there, his student Francisco Ayala took

him to the hospital and on that trip, he went straight to the presence of God, who created him.

Thanks to the purity of his science, we attribute to Theodosius, which means given by God, to have made evolution into a philosophy, evolutionism, which is something that many may have claimed. He said it all in one sentence: *Nothing in biology makes sense if not in the light of evolution.* His student Francisco Ayala was a young Spanish priest who, having studied evolution through Dobzhansky's books, became convinced of it to such an extent that he found it dishonest to continue with his faith and his priesthood. He presented his case to his superiors requesting to be fired and they granted it. He went next to work with Dobzhansky. He was one of the pioneers to whom we owe the integration of molecular biology with population genetics, the armed arm of evolutionism.

EXAMPLE: Some things in biology that seem absurd to me: There is a mutation called spina bifida and that duplicates part of the spine. The mutation has various types and degrees: from large deformities to cases in which mutants simply have a tail. And for some of these people, their tail is an integral and beloved part of their body as much as any other and they refuse to be amputated. It seems absurd to me. Absurd.

Another absurdity: some flowers have the shape of human sexual organs, some of men and others of women. Among them are orchids, admired by everyone for their beauty. I think that artificial selection caused by man has nothing to do with the existence of this absurdity. It also seems very absurd to me that there are killer babies: baby cats can discriminate and kill their mutant brothers who have genetic mosaics. The case they told me happened before the babies opened their eyes. So, I think they discriminate by smell. Baby dogs can also kill their little brothers in a moment of anger. This has amazed me greatly. In contrast, it seems very reasonable the killing of a baby wolf by his father when it, being stronger than its brothers, made them moan and groan, did not listen to the orders of the father, and continued in its dangerous games. So, the dominant baby could kill all its brothers and endanger the future of the pack.

EXERCISE: Tell something about living things that seem absurd and that hopefully cause theological controversies.

Summary: All the biological absurdities that I have read and/or imagined are not too many compared to all the wonders that I recognize. Consequently, the opinion that we exist by self-organized diffusion does not seem serious to me.

120. But will it be professional of me to accept your wise opinions as the absolute truth? Could you add objectivity to your answer?

It is going to be difficult for us to abandon subjectivity on this issue. The reason is in the difficulty of making full-fledged testing of *The Russian Effect*:

A boy receives an invitation to play Hockey at the beginning of the cold winter. He accepts and goes straight to under his bed to look for the equipment. But, when he arrives he cannot resist the temptation to play with the rope cart, and with the teddy bear, and with the wheels of his skates, and with this and that, and so time goes by until he finally gets bored, and puts on his suit. So, he comes out bearing his warm clothes but a bright spring sun together with green trees greet him.

Likewise, we can say in retrospect that evolution without objectives invents so many transitory objectives just to forget them immediately, that the time of the universe would not be enough to stop making fools. Nor to us to make a proper simulation.

The Russian Effect is an important reality in Biology. It has been proved as follows: artificial genes that encoded for random polypeptides were inserted into a genome of a microorganism. The role of the products of these genes over competitive rate growth was measured and most molecules exercised some effect, some negatively, some positively. In another experiment, random chains conferred resistance against an antibiotic in a microorganism. Thus, I adhere to the belief that any random string may find some function in any living organism. This real possibility is represented by the many divertimentos of the Russian boy under his bed. The evolutionary unfolding of this experiment is waiting for you. However and according to Great Science, this shows that new genes can easily be created by evolution. Is this truth?

Yes. It is: the problem is not to make new genes. The problem is to make something that awakes our admiration. And this is very difficult: to begin with, very ancient results showed that random proteins that were given as food were carcinogenic. Besides, we have some simulations based on SAT (an archetypal problem of mathematics) that concede us the right to claim that the wonderful possibility of evolution without objectives has a very clear distinction: great variability over pervading mediocrity.

EXERCISE: Make a research on random poly peptides, random polipeptide chains, random proteins.

What we have said induce us to extend and invitation to you: every time you see something that seems wonderful, ask yourself if there are mediocrities in its fossil record. Do you think a lemur is a mediocrity? Do you consider a fish a mediocrity? Do you think that an amoeba, which is a unicellular fungus, is mediocrity? If so, say and preach that we exist by self-organized diffusion and put together experiments that prove it. But if not, keep in mind that the Creator will call you to

render an account of the intentions of your heart. But surely you are a very good person. I accept it, but give a look at the socio-political system from which you take your daily stability, that is, through which you drink the blood of the poor and the pain of the earth. So, treat all people with kindness and to the extent of your possibilities, pay your taxes with joy.

EXAMPLE: What has life offered me? Ask the Colt. Nothing. But he does not give up: risking his life, the Colt managed to steal a set of tools from a warehouse. And knowing that they can kill him at any moment, he sold them for what they wanted to give him. With the money he has enough for his vice and also to collaborate with his house: his work bears fruit but no one respects him. That's why he walks with a knife.

EXAMPLE: Don Juan works as an occasional government employee. They employ him to maintain the streets. To not pay him social security they hire him for 3 months. He leaves his house very early and arrives too late because the day runs out between commuting, waiting for review, and working. His salary disappears almost completely the same day he gets paid. He hardly even sees his family, but when that happens, he doesn't have enough to invite them for an ice cream. But it doesn't matter: *Thanks God they hired me this season. Or if not, I would be with one hand forward and another back!*

EXAMPLE: A typical variant of corruption happens when the Government gives a contractor a task. He outsources employees and pays them to build trust. But after some time, he disappears with high sums of money and owing a lot to each employee. For its part, the Government has not given, nor gives, nor will give any compensation. But in return, it will offer magnificent rhetoric.

COUNTER EXAMPLE: All the governments of the world show their wisdom and tenacity doing everything possible to raise taxes and create new ones. However, I see that the standard of living improves and sometimes something is done in favor of the people. A case that I like, although somewhat satirical in itself, is that of mass and express transport. A transporter explained to me what he saw: before the installation of that transport, people arrived at the bus stops at three in the morning to go to work, but the massive and fast transport allowed them to arrive at 4.

EXERCISE: Find out whether or not you are increasing global warming and widespread erosion and whether or not they have negative effects that fall on the

weakest. Can you personally do something about it, with meek wisdom?

121. Since evolution is a diffusive process and has no objective, the concept of complexity cannot be applied to it and therefore it cannot be accused of mediocrity. Your refutations may serve for the applied evolution, which sets goals, but not for the natural, free of every objective.

Our complexity measure does not apply to the objective, to the proposed problem, but to the process that solves it and, being so, measures the resources used in its resolution. And since evolution is a diffusive process that takes steps, one for each birth, the measure of complexity would count the number of steps. However, within the world of possible combinations, those that produce objects that serve for survival and reproduction are scarce. They need to be very sophisticated to be as fluently as the living beings that we see and that we are. We describe sophistication as associated with extremely rare structures and to which any change or series of changes makes them mediocre or unusable. Therefore, natural evolution, by diffusion, has to leave abundant marks of mediocrity to be credible. As there are no such marks, the Evolutionary Theory is false.

122. And what would happen if any change damaged everything?

There would be no variants, there would be no evolution. Such is the case of enzymatic monomorphism, which occurs when an enzyme has no registered variants. There may be mutants but if so, their relative frequencies must be so small that they do not come out as a result of sampling. In such a case, there would be no traces of mediocrity. Everything would always be perfect, as we see it.

123. You are overruling yourself: the mediocrities that you predict so much do not exist because they simply should not exist.

Mediocrity is inescapable even if it is not found in all genes. Let's see: in genetics, monomorphism is combined with another property, that of being essential. When a gene is essential and monomorphic, any mutation is lethal, not only does the function end but the carrier zygote dies. Essential and monomorphic genes account for 60%. So, 40% allow mutations. Most of those registered are harmless, they are called neutral mutations, but some others are deleterious causing impairment of function, i.e., mediocrity. If so, a few additional mutations in tandem can be so harmful that they spoil the function completely. The same happens on an anatomical scale: we endure many malformations but not so many that we cannot recognize ourselves as human.

EXAMPLE: The O_2/CO_2 balance in the blood determines whether one should breathe or not. When there is proportionally a lot of CO_2 , one inspires and lives.

But what makes it possible for this to be known? It is because there are specialized cells that measure CO_2 pressure. If these cells malfunction, one falls dead. And if it is a zygote, it dies quickly because the development of the circulatory network is guided by the CO_2 pressure. Therefore, the genes that encode for CO_2 sensors are essential.

SURPRISING EXAMPLE OF MEDIOCRITY: The case of someone who was born with only one of the cerebral hemispheres was reported. He did not notice that he was deficient until adolescence.

We see that there are mutations that cause impairment of perfect function. Therefore, mediocrity is inescapable while evolution was exploring for perfection along the reverse path.

124. You refer to the lemur, the fish and the amoeba as epitomes of perfection. This is precisely what evolution says: that the goal of evolution is perfection. So perfection cannot be a witness against evolution, because today's perfection is the result of yesterday's effort and today's species are perfected versions of those before.

Make something better. I have to tell you that in nature there is perfection but not perfectionism. It is precisely because of this that artificial evolution exists, which has produced the milk cow, a marvel of production, upon which so many cultures have depended.

EXAMPLE: Wild dogs have nothing beautiful compared to the dogs we have selected. But those ugly dogs are the ones that have survived for millennia. By contrast, the beautiful ones can not survive without veterinarians. Similarly, our agriculture is so corrupted by seeking commercial perfectionism that even garlic, a natural antibiotic, must be fumigated with pesticides so that it does not get infections and can be commercialized.

EXERCISE: Destroy the following argument claiming that natural selection does not exist in nature:

A certain chemical component is needed to be used as a drug for humans and it is produced by a bacterium. But biotechnologists realize that the production of natural bacteria is not enough to be useful in an industrial process. Therefore, they subject the bacterium to artificial selection, where abundance in the production of the given substance is the criterion for selection. So, they have managed to multiply production by 50,000. How is that possible? Because in nature there are no forces that cause a direction, a mania for refining a given and fixed characteristic.

Therefore, everything exists but without perfectionism. Thus, we see that the concept of selection is human. In short, there is no Darwinism in nature unless it is conservative selection.

125. Improving performance 50,000 times is something that invites you to believe in the unlimited power of evolution and its ability to achieve perfection. Why do you offer so much resistance to accept it?

In general, the perfection of some things may well be explained by evolution. But not everyone's. Think of yourself: when do you say that something is complicated? When mediocrity is the top of your efforts. When you think of something better, you realize that you must start a different plan. Our simulations and those of the whole world say that the same thing happens repeatedly to evolution: it can produce mediocrities in many cases but it has to make many attempts before achieving something better. And the resulting chain of successive improvements might be long. That is real evolution. Therefore, a retro-prediction of the Evolutionary Theory is the inescapable mediocrity. Now, there is no reason to say that yesterday's species are less perfect than today's.

EXAMPLE: In the sediments of the Precambrian, 600 million years ago, there are fossils of bacteria that are as modern in everything as those found today. And if they are found in the sediments, it is because they were very abundant, that is, very well adapted to their environment.

EXAMPLE: A girl suffered an accident and her spine broke at the level of the lumbar region, at the hip. The doctors tried to rebuild her and having done the best they could, she could move and fend for herself. This is something incredibly wonderful. But in her movements, one could read clearly and, by the way, from far away, that if she was not born deformed then she was patched. Why? Because the anatomy of the spine is tremendously chaotic: any slight anatomical change can produce gigantic divergences in movement. And any change produces something worse, never something better. Now, according to International Literature, magical evolution can avoid all that. But according to common sense and simulations, real evolution does not. Sometimes, it can't even compete with randomness, which is much easier to program.

EXERCISE: Research jellyfish, how rudimentary they were 500 million years ago compared to now. Its appearance is explained in Science by evolution. Decide if this evolution was magical or chaotic.

We have emphasized the absence of mediocrity in the fossil record. However, the creationist tradition, which has always accompanied humanity, has never

needed the fossil record. Because it is enough to look at the body itself: its excellent perfection shouts that it was created: if it had appeared by any other factor, evolution or aliens, the body should be invaded by mediocrity both in its form and in its functions.

126. You have stressed that each intelligence comes with its poison. I propose to use this aphorism to explain why evolution has failed in your simulations while everyone is demonstrating that it works.

There are many problems solved by evolution. And with supercomputing, even more.

EXAMPLE: Thanks to supercomputing, biologists can now tell aeronautical engineers: *Do you want to know what the airplanes of the future will look like? Well, look at a bird, it is the answer.* They can say that because evolution was given the task of making a robust and aerodynamic design, including support structures, of a super-aircraft that obeyed the laws of physics of movement in the air. And evolution responded with a structure quite similar to the wings of the birds.

So, the problems that evolution can solve include some that come from the future. My respects both to evolution and to those great researchers who have put it to work. But on the other hand, we have seen that evolution cannot solve a problem that is simple for a human being, as is our problem of untangling a 2D thread. Is this contrast a correct illustration of the aphorism of the poison? Let's work the problem slowly. So, let's first look at the unique importance of the thread problem.

If the genome is software, evolution is then a software developer. In effect, that is what the simulations say. But they also say that there is not a single reason to believe that my genome has been developed by natural evolution. Why? We can clearly understand it if we show that the problem of the thread, against which evolution falls, contains the essence of the problem of genetic programming, of software development through evolution:

We have no problem in programming the evolution so that it produces endless sequences of random lines of code, in whatever language, say in the DNA of my cells. Let us ask ourselves now: What is the unique and total difference between one such sequence and my genome? Answer: it is just a matter of order (plus many lines of nonsense code that would be attached at the end of the requested program). Let us notice that this is exactly the essence of the problem of untangling the thread in 2D: it is matter of order and nothing else. Therefore, if evolution cannot untangle the thread, why should it be able to untangle any genome project given by chance?

We have thus argued our opinion that the problem of the thread is fundamental in the study of evolution. And, what does this have to do with the aphorism of self-poisoning? We propose the following answer:

Any very long sequence of random lines of code can be rearranged by a series of mutations to produce whatever program. That is, if both time and computer memory are unlimited, evolution can reproduce any program. This would still be true if one does not give the program but the specifications of what it should do. But when resources are finite, the imbalance of probabilities between the paths that lead to the solution and those that lead to mediocrity makes the difference: all resources are repeatedly spent exploring the infinite variety of emerging solutions that can be improved a little and that are selected not to progress but to continue spending resources because they lead to a local minimum of low quality. As we can see, the preferable selection of the best, which is a mediocre one, is what causes resources to be spent and so, there is no way to explore undervalued options but that in the long term could lead to the perfect solution. Thus, the preferable selection of optimal mediocrity is the poison of evolution.

Chapter 3

HUMAN QUESTIONS

3.1 Mind and heart together

127. Can we conclude from what you have said that God exists?

Consider first the scientific point of view. We can capture it if we remember some details of the discovery of one of our planets. It turns out that the data showed a mysterious disturbance of the trajectory of the planet Uranium. Thanks to the theory proposed by Kepler, Urbain Le Verrier could infer that the disturbance came from the presence of another celestial body. And what's more, he predicted in which region of the sky one had to look for it. Two months later they found it and baptized it with the name of Neptune.

Likewise, if logical arguments demonstrate that there is a disturbance in the data that cannot be explained by the laws of nature, and especially by evolution, it is necessary for science that someone proposes a theory about the origin of such a disturbance, and how the cause can be registered. Therefore, the falsification of the Evolutionary Theory only means that there is more work. That is why my allegations are no demonstration of the belief that God created us.

But on the other hand, no human being is a scientist. Indeed, no one is guided solely by the results of the experience. All of us are guided by whims of our intuition, by silly ideologies and by contradictory concepts. Nevertheless, we have survived.

EXERCISE: All scientists believe in omens. The proof is that they wholeheartedly wish his friends good luck and think that it is effective. Decide whether or not the laws of physics, classical or quantum, are compatible with such a belief. Compare their behavior with those of Christian believers that bless their friends in the Name of the Lord and think that it is effective.

EXERCISE: Research about Kepler and astrology. About Ticho Brahe and astrology. About canonical coordinates and Hamilton's equations. Use your research to decide whether or not you agree with the following: Brahe and Kepler are taught today as two fundamental columns of modern astronomy. But they were actually two fundamental columns of astrology. Indeed, Brahe wanted to make better horoscopes. And Kepler implemented his wish. In particular, he implemented his heliocentric planetary system model in order to justify the horoscopes' belief that the god sun is the spiritual power that governs everything and that defines everyone's destiny by the position in the zodiac that it occupied at the time of his or her birth. The heliocentric model is culturally interesting, producing very simple descriptions of motion, but it does not have any physical privilege as all reference systems are welcome. That is to say, the laws of physics are objective and can be formulated from any reference system and there are transformations to link different descriptions to each other. In particular, those who have to launch ships into space and bring them back can use a coordinate system linked to their space base. Such a system would be non-inertial and could merit the use of Hamiltonian formalism. Therefore, at that time there was no war between religion and science, but between two religions: Christian and Chaldean. Those in power, killed their foremost important enemies with fury: this was the Inquisition. Intrigue: What happened in the history of the world for astrology to become astronomy?

Therefore, for human beings, real and irrational, the falsification of the Evolutionary Theory may simply be another contradiction of the many they already have: they will teach the Evolutionary Theory as the Truth, but they will say that there are people who believe that the theory is false, and with their wage they will show to the world how successful they are. As for others, the falsification can be the proof that God exists or at least aliens. As for me, I was born with a very strong theistic instinct and I always knew that the Evolutionary Theory was false. But I needed dozens of years to translate that feeling into something logical. But when Java became open source, I began to simulate evolution, and one day I asked myself:

Why do I make so many mistakes, some so dumb but that cost me so much, and why can't I do things right without making so many tumbles? And, I thought: if I make so many mistakes or bugs, being that I am a human being, that is to say, very intelligent, then evolution should be worse: where are the bugs made by evolution?

And I searched the sky and the earth looking for them, but I didn't find them. This was already something logical.

But it was necessary to argue why we can extrapolate my experience with Java to the realm of biological evolution. With what we know now, that is simple: the genome is software, written in the DNA language, and this language is as chaotic as

any other programming language with universal computing. Therefore, if evolution could design a genome, its fight against bugs should be noticeable both in the fossil record and in the body of every living being of today. As such a prediction is not fulfilled, the Evolutionary Theory is false. Obvious.

Now, if my theistic instinct is strong, it must exist in every human being even if it is weak. Therefore, knowing that the Evolutionary Theory is logically false will fan that instinct in every person. If that revival translates into repentance, to leave infidelity and lies, then it is because what is promised is being fulfilled: *the earth will be filled with the knowledge of the glory of the Lord as the waters cover the sea.*

EXAMPLE: Muslims are openly against Christ and from time to time they kill Christians in obedience to their religion. Although, sometimes it is because of our fault. However, I have found Muslims who harangued me with the expectation of the Lord's return. Seemingly, they don't know what the Lord Jesus comes for: He comes to give each one according to his or her deeds: Is a good deed to kill his followers? Anyway, there is a predefined number of martyrs that must be sacrificed and muslim believers are making a good deal to complete it, be it by direct action or by complicity that results from keeping silence.

128. From what you have said it follows that you support the creationist theory of intelligent design, say, you emphasize order, detangling, clear and evolutionary style, high complexity as symbols of great intelligence that goes hand in hand with great tenacity. It is right?

Because I believe in God by instinct and in his Christ because of my personal experience, everything you mention separates me from the Evolutionary Theory and reinforces my faith. But this has nothing to do with science. Or, could I publish an experiment, at least one, clear, simple, blunt and repeatable that demonstrates that there is something more than sulfur, iron, and lithium? Some volcanoes are large sulfur deposits, which shows that matter is very real and on our side. Likewise and if we consider that gravitation is a universal interaction, I should be able to say how much God weighs. But I can not. So, the word of God is fulfilled: *the righteous shall live by faith.*

129. Why are we so interested in truth, and lies, and evidence and falsifications? What is the truth? If one accepts that nothing makes sense apart from evolution, the truth is what allows me to survive. What is it for you, Mr. Creationist?

The truth is what fills me with joy and peace and gives me a project of abundant life even amid the storm. I have seen in people of various cultures the joy that Jesus,

the Christ of God, gives. And that impresses me greatly because although God is my joy, it is not that I live jumping. Instead, I have received several complaints of being very cold.

130. In the struggle for survival, there are many ways to rejoice: countless chemicals next to relaxation, autosuggestion and hypnosis techniques. And it's not about you becoming a happy robot, but about your subconscious fixing your metabolism so that you lose weight and be healthier. Or one can experiment with electrodes properly placed on the head or even inside the brain, as well as with a healthy way of totally atheistic recreation. What sense can we grant to your truth in the light of so many things that defy what you tell me? Let us keep in mind that there are many Christians who are drug addicts, to say the least. You might say they are not Christians, but I say they are.

Satanism is another frenzing source of adrenaline. Well, I met someone who was satanic when working as an engineer. But after talking with a Christian, he managed to catch that he had been the enemy of God who created him and that loves him so much. He told me that he cried with regret kneeling on the edge of his bed when he reconsidered his past behavior. Like this, there are countless facts that one organizes according to his or her prejudices and feelings. We are all like that: we see the world according to the color of the glasses we wear in the soul. In this sociological sense, there is no truth more valid than another.

However, if one day you become depressed, and if you have already realized that nothing fills the emptiness of your soul, remember me and put into practice what I am going to tell you: *fast an entire day and every time the guts make cro-cro, thank God for your left hand, open it and close it, and thank God. Do it all day long.* The second time you decide to fast, ask God *to bless your enemies, those who have somehow hurt you. Learn to pray for your enemies until you feel the peace of God that surpasses all understanding. Do it all day long and by name.* The joy you will feel will indicate that you have had a close encounter with the true God. And as God is holy, we pray in the name of Jesus, the lamb of God who takes away the sin of the world.

131. The zeal with which you defend creationism makes me think that you are a fundamentalist Christian, that is, someone who blindly believes in what the Bible says. Am I right?

Yes, totally. But I do not defend the letter but the concepts. When one reads something, whatever, one must do the same thing that is done with a watermelon: the shell, the letter, is cast away, but the pulp, the concepts, are eaten. To understand what I say, let's consider the book of Genesis. This book is clearly a story for children, and especially for the child that we all carry inside. It was invented as

a work of literary engineering that consisted of packaging the basic concepts of religion within the language of a certain culture and in an effective, viral way. What concepts? For the most part, they are the same that each of us could invent: *that God is a person. Consequently, he needs to be loved and spoken to. He is unique and jealous, creator and lord of everything, good, powerful, who loves the family. There is a devil whose hallmark is cunningly enjoying lies as well as spilling innocent blood.* These concepts are part of the natural religion. They appear here and there in many creeds and religions. But on top of that, there are notions that are definitely specific: *The devil and the evil will be defeated by the woman's son. But he must pay a high price.*

132. You do not adhere to the letter. Why?

Because for the very biblical authors, the letter is not something very important. For example, they put God to create the sun after he created the plants. The problem is that there are no plants without light. For example, there are no plants in dark caverns. But if these are damp and the waters come from the surface and bring organic waste, there are mushrooms and blind scorpions. Therefore, it is not the sun, nor are the plants that matter. The important point is to know two things.

First: the sun, the moon, and the stars are created, they are not gods, they are not for being worshiped. Because the only one who is worth worshiping is God the Creator. This is the first great commandment.

Second: complexity is hard for God and therefore He must plan, and if He must do it, how much more do we: wisdom is not something optional but acquiring wisdom is the second great commandment given by God to every man and every woman. In our language, it reads like this: *whoever does not love complexity will not enter the Kingdom of Heaven.*

So when designing something, first of all, worry about communication networks and services so that they immediately give light on how things turn out. And if your job is to program, develop as soon as possible the means to see what your algorithms do.

EXAMPLE: 3000 years ago the Chinese already used geese for air messaging. The pigeons provided the same service in the West until not long ago.

However, some texts should be taken or rejected as written. The reader has no other way. For example, we can read in Genesis in the section dedicated to Noah: *while the earth lasts, there will be seed and harvest, cold and heat, day and night.* Now that we are fighting global warming, that is something that occasionally makes me think. For instance, some time ago, when winter did not arrive in Europe, I thought that this promise was falsified and that the Genesis did not go beyond

being a fairy tale. Because it seems good to me to believe that if this promise is broken, the others too, that is, the Lord Jesus will not return to earth. But winter came back and, as if that were not enough, with great frosts.

133. You say that evolution is false. But also you have matched evolution to wisdom. Therefore, you are saying that wisdom is useless.

What we can say is that one is as useful as the other. But ultimately, wisdom falls short for many important things, so much so that every person meets a time when he or she sees death as the ideal relief to the feeling of being an irremediable hindrance to him or herself. Science is increasing the pain because it elongates life but not one to the full. The glorious scientific solution has been to implement assisted suicide. This clearly shows that we are losing our battle against mediocrity.

EXERCISE: The relation of human wisdom and evolution is a source of terrible questions: Our simulations of evolution work on structures based on binary numbers, zeros, and ones, which is equivalent to working on whole numbers. If we wanted to talk about evolution and the brain altogether, there are technical questions to be solved: the enormous computing power of the brain has always aroused suspicions that it can work on something more than physics on whole numbers. The natural candidate for that something else is the set of complex numbers framed within quantum mechanics that has more computing power than the discrete physics of our computers today. Investigate how much quantum mechanics is necessary to explain how our brain works. If that is the case, would that result classify human wisdom above evolutionary wisdom or can evolution be extended to complex numbers demonstrating also that it exists in nature?

134. Many evolutionists are firm atheists. However, there are not many among them who dare to undertake a crusade against God. But there is one that has become a world-renowned personality: Richard Dawkins. Everything he says applies to you. It would be said that he deserves a clear, concise, precise and severe criticism of every creationist. What can you tell us?

I liked the comparison he makes on the sonar of a bat and the radar of an airplane. The way he shows the amazing technical parallel between both wonders is fascinating. And with the same innocence of a four-year-old boy, he blames evolution for the existence of the sonar of the bat. And with the innocence of the two-year-old brother, everyone believes it. I hope that by this time it has become clear that innocence without wisdom is a stupidity.

Another criticism: he taught the world that the guess-guesser game was a compelling proof of the Evolutionary Theory. How fake! It is the same as saying that since I can cross a pool, then I can cross the Amazon river forth and back, as Kapax did.

Something ironic: the title of his book *The Blind Watchmaker* correctly reveals what evolution is in the Evolutionary Theory: it is blind, but you have to see! First, a blind person can be very intelligent, like Homer, the Greek writer to whom we owe the Iliad. Secondly, they have a high craft capacity. We have to say the same about evolution: in hindsight, it has a great brain, a super-brain, and its hands have an infinite artisan capacity. These two qualities make her a wonder maker, whose computing and implementing power to perform instant miracles surpasses all imagination.

Third point: Mr. Dawkins wrote the book entitled *The Selfish Gene* in which he argues his idea that everything in biology, including evolution in all its aspects, happens simply as a result of a struggle for the supremacy between the various versions of genes. However, the concept of gene has nothing to do with evolution. It is a clear and exclusively creationist concept. Let's see why.

To begin with, this concept was constructed from the works on the beans of the Christian creationist monk Gregor Mendel.

Next, the gene concept was formalized by molecular biology as a sequence that encodes for an enzyme with a specific function, for example, of cytochrome c, which is a protein that in mitochondria is associated with a sophisticated system to extract energy and useful compounds in cell respiration. It happens that this protein has great variability caused by the diversity of some of its amino acids. But in general, it has a skeleton that does not admit variation although it can change slightly between species.

Now, look if you find in the Carthage problem for quadrilaterals, a fixed skeleton that remains from generation to generation. What I see is that there is nothing fixed here, everything changes. However, using a high degree of gentleness we can imagine a square that is randomly spinning while undergoing disfigurements. Such behavior is not a consequence of our tolerable programming failures, nor is it due to the mutation that never stops. It must be so because no direction was awarded in the function to optimize. Therefore, all directions give correct solutions and the mutation jumps between them.

But what is more: for low and medium complexity of the Carthage problem, measured by the number of vertices, evolution must give solutions that are spinning randomly. But for high complexity, evolution can do nothing and the concept of evolutionary solution does not exist no matter how gentle you want to be.

Therefore, the concept of gene has nothing to do with the Evolutionary Theory.

135. Do you happen to find something good in Dawkins?

Mr. Dawkins managed to make the whole world think about evolution: What is evolution? It's what Mr. Dawkins thinks. In particular, like Darwin, he is a determined supporter of gradualism. In its weak version, it says: *gathering small*

changes can achieve great wonders. It is a philosophy for daily struggle. In its strong version, which allows gradualism to be a competitor of religion, it says: *every wonder in biology is the effect of gathering small changes that began with random formations.* As we can see, Mr. Dawkins has presented us with the important core of the theory, with applications and challenges for everyone at all times. This is a unification that greatly facilitates the work.

On the other hand, the books that Mr. Dawkins published included computer simulations and these motivated many mathematicians and engineers to write computer programs simulating evolution. They have produced impressive, wonderful things. I learned from them the art of genetic algorithms.

EXERCISE: The Internet has many wonderful simulations of evolution. So, ask Google: Simulation of evolution in Javascript. Many sites have programs that can be run automatically from a PC and also from a cell phone.

But the problems I have had to face have been so enormous for me that the whole world has had to help me. Infinite thanks to all of them. And at the root of so much good is a man named Richard. May God bless him and allow him to repent. However, we are very distanced:

Mr. Dawkins verified that evolution is very good for solving problems. The easy ones, of course. It is challenging to find easy but amazing problems and he is the great pioneer of this admirable feat. For example, with a few lines of code, he produced clear cartoons of many living things that arise at random, the biomorphs.

EXERCISE: Research online about Dawkins' biomorphs.

From his findings he concludes that evolution explains the morphology of living beings. He has also taken careful note of the continuing and enormous evil of us Christians throughout history and the world. Adding the two points, evolution and our evil, he concluded that God is a dangerous delusion. And, showing his honesty, he found nothing better than chasing him.

For my part, I consider that the Evolutionary Theory is obviously false and the reason is precisely that evolution is real. Instead, the Theory says that evolution is magical. Real means that for it to work many resources are necessary, too many and recurrently, that is, it cannot reach perfection quickly and therefore leaves indelible traces of imperfection both in the fossil record and in our body, in its anatomy and physiology. That evolution is magical means that the resources you need are so minimal that moving from the total imperfection of chance to the perfection that we see in us took no time. And therefore, there is no reason to expect malformations, neither in the fossil record nor in my own body, which would be accompanied

by dysfunctions. Our simulations clearly demonstrate that this is false. To prove it, all you have to do is put a difficult problem to evolution, and these have been formulated by thousands.

Mr. Dawkins: You have a lot to study.

136. The ideas that you expose create a backward movement of 3000 years when everything was simple, clear and definitive because every question was answered: God did it so. Are you willing to inherit such a shame to future generations?

Yes. Or, is there another explanation for the fact that my hand is so wonderful?

137. It is well known that evolution can synthesize genes de novo? By this time, this is already a classic, well documented result. So, How can you deny that your hand is not explained by evolution?

Our simulations clearly say that both randomness and evolution has no problem in synthesizing objects of incipient quality. So, we support your claim. But, as every one knows, it is very difficult to make high quality objects, such as natural genes. Now, this challenge is ignored by the evolutionists that published the results that you refer to. Anyway, it is interesting to discuss some details of the problem:

Scientists compare genomes, by pairs. If they found two that are similar, they claim: *they got connected by recent evolution*. If similarity is weak, they elongate the time of divergence. If similarity is null, i.e., if a suitable distance of the two genomes is approximately equal to that among random strings, they say: *their common ancestor lived in the distant past*. This methodology produces evolutionary trees. They are used to explain the existence of genes, by modification of descent.

Now, some genes are exclusive, they are present in a group of interbreeding organisms but not in others. To explain them, scientists find various possible families of explanations. Examples:

- Evolution can create genes *de novo* from pseudogenes. This is a DNA string that is similar to some gene but that is not expressed: no RNA, no peptide, no protein, no enzyme. That is why this DNA was called in ancient times junk DNA, and it was normal to consider it worthless, noise, random.
- Exclusive genes are ordinary fruits of evolution by descent: in the past, they were present in ancestral species, but more recently they were deleted except where they are found at present. In particular, pseudogenes are the last link of a gene to its evolutionary past.
- Exclusive genes are extraordinary fruits of evolution by horizontal transfer: microbes have all kinds of genes, and some were transported to the genomes of higher organisms. The source microbes got extinct.

- Exclusive genes do not exist. Instead, they are sampling artifacts that originate by our very partial knowledge of the microbial world, which is exceedingly big: there are some 400 species with a hot dynamics just in our digestive track.

EXERCISE: According to the scientific method, calculate some observable predictions that can be drawn from the second listed possibility.

Let us consider the first explanation: evolutionists correctly interpret the evolutionary thought by considering that the trend of evolution must be from pseudogenes to genes and not the other way around. The reason is that evolution is dogmatized as the explanation of the accumulation of information. Nevertheless, the evolution of genes into pseudogenes is also justifiable: a gene can be duplicated, and one of the copies becomes a pseudogene by just losing the signals for expression into RNA. Let us prove now that a new pseudogene can gain a function and thus get trapped by selection that begins to function as a stagnating force:

The genome is a library of genes with ensuing logistic needs. One of them is to make each gene localizable to receive instructions to, say, beginning transcription or stopping it. This is a natural function for pseudogenes. In this way pseudogenes that evolve from a gene might acquire a function and get subjected to evolution for further refinement. So, they mutate and get trapped into optimal functionality and so, evolution from a pseudogene into a gene is forbidden.

138. You have invented a problem where there is none: just add your explanations to mentioned ones and study them all.

It is not that simple because the just presented explanation can be further dangerously elaborated. Let us see:

If the function of the original gene is not essential, the gene can be deleted and the species can survive. It will have a pseudogene but no gene.

EXAMPLE: The human genome contains a pseudogene that, if converted into a gene, would encode for the synthesis of vitamin C, which is not produced by any of us. Thus, the history of the human race might be as this: *in ancient times our ancestors produced vitamin C. But some mutants lost this power and because of a bottleneck, a sudden reduction of population size, they became the Noah of the new humanity.*

139. Is your intention to prove that the biblical narration of Noah is a scientific theorem?

No. By no means. But the whole picture is suggestive.

140. Your suggestion is very weak to be important. Where is the danger you promised?

The danger is here: gene-pseudogenes pairs can be explained by Science in many ways. But pseudogenes are counted by thousands in our genome and exclusive genes by tens. So, one explanation seems unavoidable: genes are usually invented by evolution *de novo*, from scratch, from random sequences. We see that science has returned to Middle-Age when people believed that dangerous microbes can arise *de novo* in any pond. The scientific method in the mind of Pasteur was necessary to falsify that belief.

141. So, what is your proposal?

To work out again the scientific method. It is an invitation to test beliefs -if only that is possible. If a belief is not supported by a critical test, it has been falsified and must be rejected, but a new one must be invented to be tested again -if only that is possible.

In our case, the belief is that evolution can create complexity from randomness. Our simulations support this belief but *a track of the evolution of perfection is mandatory, it must always be observable*. This means that the evolutionary theory predicts, in the most favorable scenario, that your body must be filled in every kind of functional and anatomical imperfections. In regard with the fossil record, crooked skeletons must be the rule. Since this is not found, the belief that we appeared by evolution is false.

142. This is very general. What about pseudogenes, specifically?

The claim of the scientific literature is that evolution made some functions from scratch along the evolutionary process beginning with junk DNA, which can be taken as random DNA. To test this belief, we might:

- delete the gene in question but not the pseudogene and wait for evolution to create the gene.
- delete the pseudogene but not the gene and wait for evolution to create the pseudogene.
- change all junk DNA by many versions of random strings to see whether or not evolution can go one step ahead and produce superorganisms, i.e., evolution must fight to produce quality.

All this is easy to say but in reality we have formulated no-go experiments. If these experiments are mounted, nothing will happen during the first year, century

or millennium, but no one can predict for sure what will happen during the next. Changing aforementioned no-go experiments by a dogma is a crude violation to the scientific method. That is why we love simulations as an expedite implementation of the scientific method to study quantifiable beliefs.

143. Evolution has given thousands of people work, wealth and glory since 1850 hitherto. How was it possible? By showing that there are millions of questions that can be examined scientifically. But you promise faith, i.e., misery. Don't you?

As for employment, lo and behold: Darwin died complaining bitterly of his poverty. He was an accomplished, tremendously respectable scientific writer so, he expected better treatment from publishers. But neither at that time nor now do publishers do anything for the writers from which they nurture their greatness. On the other hand, if the dogmatic evolution gave work to thousands, the real, chaotic evolution will give work to millions. And for a long time, because chaotic evolution is very difficult since it is no longer a dream, nor a dogma, but it is something real, difficult, very difficult. It is part of its charm.

144. You emphasize your subjective opinion that your hand is wonderful. No problem. I can accept it. But how do you consider so many people who die when they undergo surgery to improve some part of their body? And there are also protests from specialists in evolution, such as Nathan H. Lents, who enjoys demonstrating that we are very badly done: Do your knees hurt you? Does this prove that evolution creates imperfections? What can you tell us?

Yes, my knees hurt. That's why I do exercises that improve the diffusion of oxygen and nutrients (the menisci of the knees have no arteries). And, I also practice fasting and prayer. It has served me. But mom's knees were changed to synthetic ones. At first everything was very good, but lately, he has begun to complain. That makes me think that it is easy to say that one is very badly done. The hard part is being able to do something better.

145. You are trying to delude me. Look, I proposed you a scientific problem but you escaped with an ethical message, which is certainly very relevant. But I ask you to face my question: You will die and it will be due to some failure in a critical system of your physiology. Same with all of us. That is a clear verification that there is no perfection in the physiology of living beings. The evolutionary explanation of this fact is perfect: what evolves is what is inherited beginning with the ability to reproduce, and you surely know that it works very well before 40. What happens from then on has a little evolutionary effect and it is for that reason that there is no evolutionary remedy against death.

If we talk about death, I have something to say:

EXAMPLE. All of us are terrified of death. What is this? The teaching of Christianity is simple: the main cause of fear of death is to know instinctively that after death comes the righteous judgment of God. Zero corruption. Yes, zero corruption. This teaching has an immediate prediction: *the mortal will have peace by having forgiveness of sins before God, at the price of the death of Christ, and before men, forgiving each other and compensating evil as much as possible.* That gives the mortal peace, not only at the time of departure but also when he thinks that the coming of that moment is inevitable. Is this prediction verified? Yes: I do it every day.

EXERCISE: In the previous question the evolutionary theory about death was formulated. Invent the Evolutionary theory of the dread of death, put it to test on yourself, and see if it gives you peace. Check if that peace fills your heart to the full.

EXAMPLE. Almost all persons offer resistance to die. Is such resistance effective? Many of us think so, but there are objections. One case is as follows: someone in a certain community noticed that before a large annual party, people had lower mortality than after it. The natural explanation was that the hope of enjoying the party made people want to live and that's why they postponed death. However, a statistical study of the case did not corroborate the informal observation.

Let us notice now that your question includes two sophisms. The first one is as follows: *evolution cannot influence the future of the species except through the reproduction of the fittest.* False. Evolution is a very complicated reality, and both differential reproduction and differential death can play important, independent and fundamental roles for the future of the species:

EXAMPLE: the fittest can fill the world and thanks to their success create a demographic explosion. This implies that the individuals lost the desire of reproducing, which increases the possibility of survival of the species. But the sensors of super-population are not equally sensitive in all individuals. As a consequence, individuals who end up reproducing are insensitive. This is a paradox that says: *the fittest, the most sensitive, the ones that save the species, are those that don't reproduce.*

The second point is a contradiction that is related to the hardness of aging and death. It says explicitly: *since eternal health is not the object of evolution, evolution cannot improve it. And since you can't improve it, we grow old going*

from worse to worse until death. So, we released resources and the species can prosper. That shows that evolution is effective and that it is the reason for our existence.

EXERCISE: Analyze the following reasoning:

Why do we die? Because there are death genes. These genes cause that by the age of 30, people have already seen in death the rest from so much vanity, wind, and sand, which is a lifetime. And, of course, these genes eventually kill one by taking away the joy of life that is the basic engine of health. Creationists claim that evolution cannot explain death because death is not inherited. But this is false. If one did not die, the demographic explosions would end everything. Therefore, the populations that survive are those that by chance have programmed their genes to kill their individuals in a predetermined time. And that's why we are mortal. Thus, we have shown that evolution can influence the future of the species without mediating the reproduction of the fittest, the one that can leave the most offspring, living more and better.

Thus far, so good. Let's put aside the delicious rhetoric to concentrate on an urgent task that is important for all creeds: evolution is not famous for trying to explain what is not inherited but for proposing an explanation for what is inherited. Therefore, what evolution has to do is to show that it is responsible for the perfection of babies.

EXAMPLE: Our simulations tell us that evolution can not overcome complexity. But it could be that they are bugged and that evolution can overcome anything. How can we elucidate what happens? By demonstrating that the evolution of our simulations is perfect to solve simple cases and others not so simple. This test occurs naturally because in our simulations the complexity is determined by levels, very similar to the games in which one passes a level and faces the next one a little more difficult. So, one sees that evolution solves easy cases and that it loses speed, effectiveness, and sharpness when leveling up. Then, it becomes clear that with enough complexity, evolution is just a little better than chance. But then nothing. In several cases evolution is worse than chance because complexity causes evolution to convert mediocrity into a status quo instead of selecting the low-performance elements that could be transformed into the solution.

Let us now examine an argument to understand why the illusion that evolution explains the perfection of babies is unfounded. That means that evolution is not and cannot be an explanation of how good or bad we are assembled.

EXAMPLE: In mechanical engineering, we can find hundreds of types of hinges. But in our body, there are only 6 types of them with a diversity of axes

and planes of rotation and/or opening. Each one fulfills its function in the right place. For example, a human being can rotate the head because, in the neck, there is a rotation system that consists of a bolt that goes up from a vertebra and on which another vertebra sits that acts as a circular bushing and within which it can be rotated. If instead of this arrangement we had that of the elbow, we could open and close the head up-down. Like the alligator. But to rotate the head, we should turn the entire trunk. That is precisely what the alligator does, but for it, that is an advantage because turning is its terrible and efficient technique to tear the prey.

Now, if we had been created by evolution, it must have been chaotic in the permutations space of the 6 types of hinge. Therefore, we would be badly done because, say, the hinges of the head and elbow would have been exchanged. So, we retro-predict: if we appeared by evolution, then we must find in the fossil record of the human being evident samples of the chaotic nature of evolution from complete chaos, through the evolutionary accommodation that produces mediocrity, and climbing towards the perfection of our bodies. However, due to the extreme complexity of embryonic development, together with the incredible richness of the evolutionary process, we can only make very simple and direct demands. The following is useful: at least a couple of hinges must have been wrongly exchanged somewhere in the fossil record of the human being. Let us now compare what is expected with what is seen: Is there an animal out there or a fossil, some species of mammal that has hinges exchanged? Tell me, and conclude whether or not the Evolutionary Theory is worthless.

EXAMPLE: The vast majority of joints have front and back. We are all scared of the mutations that make this manifest. The most terrible is the one that turns a lumbar vertebra and both the hip and the legs look backward. These mutants are viable and survive beyond adolescence. So, if we have 300 joints, we would have 2^{300} possible ways to be assembled. Where does so much perfection come from in my body and whose evolution does not appear in the fossil record?

EXERCISE: To the previous argument add the anatomical concordance that must be between the way of moving allowed by each hinge and the muscles that execute the movement. And if you still have some time left, add a chaotic evolutionary consideration of the neuronal management of the whole set.

INTRIGUE: A lady gives birth to a baby and as soon as possible, she examines her everywhere. She finds her perfect and healthy. In response, she decides to thank God by offering a gift to the poor. What did her brain do to infer that being born perfect is something miraculous since she has no idea of the meaning of 2^{300} ? Why does her brain allow her to squander the money she knows she will need by the time the child gets sick?

EXERCISE: Imagine that the evolutionary process, the real and chaotic, have evolved you and your species a lot but not totally: the hinge that links your little finger to the left hand has not been perfected and so, it closes to the palm only a little, but it opens out of the palm impressively because it can be placed completely perpendicular to the palm and on the same plane. The culture in which you live has put roles to such a finger and, in general, everyone feels good. But they are envious of the few mutants that have their little finger like us. Explain why. The next time you face depression, take advantage of your conclusions. Personally, to combat depression, I thank God for my eyes and vision.

EXERCISE: Research about the valves in the body: in the heart, in the veins, in the lymph nodes, in the capillaries. Find out if the valves have front and back. Ask and answer the corresponding question about chaotic evolution. And, what about plants? Each stoma is a selfregulated valve!

146. Is there any understandable reason why complexity should exist?

The complexity stems from wanting to be able to do functional things on request. When one proposes a simple assignment, I want a wife, one meets many satisfactory options. If one adds some condition, there are not so many options: the woman must be a redhead. Very few comply with one more condition: she must be meek. In the end, one or less: She must like me.

Geographically, the situation is equated with a sea of meaninglessness that surrounds the continent of what is useful for something. That continent has many options for any simple request. But as sophistication grows, one has to look for solutions to the borders that are generally like horns. When sophistication is not much, we are in a wide horn region. If sophistication grows we must move to a narrower region. If you get out of there, nothing makes sense, you lose everything. If sophistication continues to increase, one may have to go to a region of microscopic width or may have to fly over a scattered archipelago, then over a widely dispersed one. And then nothing. This is the side of the complexity that costs us so much and that allows us to earn our daily bread. But there is more:

EXAMPLE: The complexity of the matter is a blessing: all that exists is poetry composed on an alphabet of about 100 chemical elements and countless modes of electromagnetic radiation. It is wonderful that this alphabet serves to give so much variability, on which our programs of optimization walk.

HARANGUE: Being tall is a feature that many find attractive - although not all because it costs a lot to feed and dress people too tall. But if two very tall people get married, their children will be, without exception, shorter than they are. It seems

to me that something similar happens with intelligence: very intelligent people end up torturing their children because they generally cannot accept that geniality is neither inherited, nor selected, nor taught, but that it is a mystery. That's why schools for geniuses have no choice but to try to attract them because they can't make them. However, maybe you think you are normal. But I will be honest: all ways to prove that someone is not a genius are false but the only way to prove that someone is a genius is that he or she proves it. So: choose what you like, work hard, pay the necessary price, and love criticism because we all need each other: there is no wisdom against complexity.

EXERCISE: Analyze the following argument and destroy it, if you can: In an improvement process, one makes improvements and more improvements and reaches such a point that nothing can be done because, with rare exceptions, any change damages everything. If this could be applied to the genetics of intelligence, we would have the son of every genius should be an idiot. Interestingly, geniuses are not prone to marry a consort as great as them. As a consequence, their children are normal because recombination frees them from the imminent danger of super-specialization.

147. You say that God also feels the burden of complexity. It is impressive that you dare to apply to God the same fear that complexity makes you feel. Where do you get such gills?

Your question is right. I have had to struggle a lot with the idea of a magical god who can do everything just by wishing it. The first step to destroy this conception has been to demonstrate that the god of this age, the evolution that is magical according to the Great International Science, is a false god. And that real evolution, whose abstraction one can simulate at any moment, is a process from which one can read how difficult is to face complexity. The second step is to extrapolate the same idea to all reality, including the spiritual one: complexity exists and exists to love it.

148. That is to say, your experience with the simulations of evolution, with genetic algorithms, has given you the strength to battle not only against science and its magical god but also against the Almighty God that the Bible proclaims so much.

There is a basic difference between a god of magic and the Almighty Biblical God. The first is a fairy with big eyes that moves her wand and that's all to it. The second is someone who has previously worked hard to make things happen as if they were by magic. It is admirable. Indeed, to make a living being feel like a god, who can do what he wants with his hand, it is required to have overcome a

world of complexity that one can hardly imagine. So the challenge God gives us is overwhelming: *complexity can be overcome*. It's amazing. It is so incredible that one has to see it to believe. Although in reality, it is not that one overcomes the complexity that remains a slave. It is rather certain domestication, which is closer to the crocodile than to the dog. Because I have something to tell you:

Our usual, ordinary world is that of recipes, that of algorithms. As we all know, this world is terribly complicated. Therefore, it is amazing that any human being can make a 300-line computer program, something that could take more than the age of the universe to evolve by genetic programming. But even though we are so intelligent, so mysteriously intelligent, our mastery over complexity is still very partial and sometimes incipient. There are three reasons for that to be so.

First: To solve some optimization problems, you have to test all the options, one by one, and only then, can you know which one is the best.

Second: For the vast majority of algorithms, the only way to know for sure what they do is to put them to work and see how they behave. The complexity of our ordinary reality is nourished by both sources.

Third: we are very intelligent and for that same reason we make silly but very expensive mistakes because each intelligence creates its own traps where it falls blatantly.

EXAMPLE: I had to find the measure of a certain angle and geometrically it was seen that it was the subtraction of two others. This is intelligence: interrelate geometry on the Cartesian plane and algebra to solve problems. We owe this idea to René Descartes, who proposed it about 400 years ago. So, I wrote the subtraction mentioned as an equation. But I did not take into account that an angle was negative, even though I knew it well because it was the working condition that was written on the same line:

```
if (aTgt <0.0) aTgt = 180 - aTgt;
```

Well, I took a whole day to know why the final result of the program was not correct. So I looked for the cause on many sides until I cornered it against the sign. I corrected it, instead of a subtraction I put a sum:

```
if (aTgt <0.0) aTgt = 180 + aTgt;
```

and the program ran well and so far, a day later, I have not found faults.

This happens to me all the time. Once I decided to travel to transport a keyboard. When I was on my way, I realized that I was wearing everything except the instrument. But I did not return.

Now, will I deprecate my intelligence, so willing to blind myself? No way: thanks to the fact that I had to review a good part of the program, I discovered that I couldn't think clearly because I had made an abstraction error: I represented a train as a house. Therefore, I designed and implemented more transparency, and now I have a clearer and more elegant program. Just a little more, really, because improving style is an endless task.

EXAMPLE: The operating system of my desktop computer is updated every week, which consists mostly of replacing some code texts with better ones. What happens? Why can't there be a perfect operating system that is sold to me once and forever? The problem is that testing an operating system takes months and the only wise thing that can be done is to put it to work to see what are the most common problems to try to solve them. But when correcting each solution, it is not unusual for something worse to come out. And as there are so many possible causes of errors, a good solution is to let users make their tests on the fly and to provide an automatic system of registration and reporting of problems or bugs.

HARANGUE: To get fruit, add persistence to intelligence. In the language of Winston Churchill that is said like this: *geniality is 5% of inspiration and 95% of sweat and tears.*

149. Does the Bible say that God cries from despair because things do not come out? Or, is this all your invention?

It is an invention of mine but with reasons. For example, I have noticed that people face complexity either as a curse or as a challenge that can be a source of intense joy. And I have seen that many manage to go from being bad children to being fighters who enjoy problems. How do they do it? Facing problems, filling gaps and trying on one side and the other. In fact, and considering that complexity is inevitable and ubiquitous, loving it is the only way to override it. Now, I think that God strives to be on the positive side. But it hurts. Otherwise, it would be wrong to pretend that we are the image of God. So, I infer that complexity costs him a lot.

EXAMPLE: God's great problem with us is that we delight in evil, for example, in revenge. To this acute problem, God gave a very negative and sharp solution, typical of a beginner boyfriend: *My Spirit will not contend with humans forever; for they are mortal; their days will be a hundred and twenty years.* Or, is it that the boyfriends are sometimes right?

About the nature of man, several biblical passages have given me much encouragement to think as I think. For example, once Jesus was asked: *How will a*

false teacher be known? And he said: by their fruits, you will know them. The alternative would have been: *pray God to reveal them to you.* But he didn't say that. He said: *have the supposed teacher reveal the algorithm of his behavior that is in the intention of his heart and evaluate the result.* Why? Because the intentions of the heart are chaotic, a tiny difference can lead to gigantic changes in behavior. *Therefore, there will be two women in the millstone, one will be taken and the other left.* And, moreover, because the cheapest way to know what an algorithm does is to run it and, attention, scrutinizing its fruits. Indeed: according to my vast experience, the best way to correct the errors of a computer program is to write, draw or sing what it does, especially the painful points, and check to see if results make sense or not. In order not to suffer unnecessarily when programs are developed, the following slogan adapted from the Gospel is infinitely useful: *Build over the sand and the sand will be your grave. Build on rock and continue building but take care.* The sand is represented by all those lines of code that seem to work well but have not been critically tested. But the modules that have been thoroughly tested are like a rock that is not removed with rain.

I regret to report that computer programs in this world are mostly sand, if not, quicksand. That is because there are too many tests before a program might be declared correct.

EXERCISE: To get acquainted with the theory of algorithms used here research over Algorithmic Information Theory and Kolmogorov Complexity with applications to Computer Science.

3.2 Can we speak about politics?

150. Does all this have any application to the social or political realm?

Traditional genetics tends to celebrate the power of selfishness. This power is very serious: selfishness is given the task of having each one surviving and reproducing. It is very serious. But there are already too many studies that indicate that vicious selfishness is a loser. A winner is a combination of selfishness and altruism that consists in defending the other, even though we have to pay some cost.

EXAMPLE: the pigeons have their eyes next to the head so that they can see the hawk that comes in a dive from behind. Also, I have seen pigeons training to give boats because when the hawk reaches them, they give a boat, they fall a little and the enemy overflies by. In contrast, primates have their eyes straight ahead and therefore, lose defensive power in comparison with the dove. But we have

survived. Why? Because we form self-defense groups and we all take care of our backs: today I take care of yours, tomorrow you look after me. Or my children.

Altruism is what glues the community. Where is it born from? It seems that altruism is based on reciprocity, that is, on using the community to satisfy one's selfishness. This is where social ethics and its famous law are born: *don't do to others what you don't want them to do to you*.

The power of the community is used by many species.

EXAMPLE: the world is saturated with all kinds of pathogens, but a plague rarely happens because few pathogens achieve nothing. Instead, special conditions are required to proliferate a certain species so that many can cause havoc.

EXAMPLE: Oppression exists because we prefer to live under oppression instead of dying like a lion. But a limit exists. So, there have always been, and there will always be social revolutions because many people tired of a miserable life can come together overcoming the natural selfishness that commands them to avoid the risk of dying.

151. And the Christian?

Often the Christian is nothing more than a piece of old rag that does nothing but let himself be swept away by the social tendencies that include conquests, revolutions and all kinds of social fashions.

EXAMPLE: Because of its magnificence, Constantinople was the capital of several empires from the 5th to the 15th century. His eternal greatness earned it the nickname of *Instanbul* which means *The City*. Its richness, culture, and quality made it famous throughout the world and thanks to that, Christianity naturally expanded to several countries. For example: in the ninth century, the Russian Tsar sent an exploratory embassy around the world to choose the best religion. Upon returning, the ambassadors brought him the Christianity of Constantinople. And the Tsar asked them: *Why did you choose this religion as the best?* And they replied: *when they sing, one feels in heaven*. Orthodox missionaries designed the Cyrillic alphabet, which is still used in several Slavic languages, and translated the Bible. Their fruit is still seen today: the heroic Christians of the twentieth century endured the persecution of Soviet communism, while modern Russians have officially helped the Christian Church of Syria that has been the target of attacks.

Thus far, so good: we see that when the world is doing well, the Church is allowed to flourish. And what happens when the world is doing badly? To see it, let's return to Constantinople:

This city was the covetous object of several Ottoman leaders until one of them, using demographic and technical power, conquered it in the mid-fifteenth century. The invading Sultan also made it the capital of his empire and showed him his appreciation with reconstructions that began immediately after the surrender. A bit later, the Ottomans realized that the local inhabitants knew financial bookkeeping and for them, it was very good given the flood of wealth that came to them. So, they offered locals jobs as long as they renounced their Christian faith and moved to Islam, which means *to voluntarily submit to God Allah and the Koran*. Many accepted: the city adopted the nickname with which it was known, Istanbul and, for almost 6 centuries, it has been a key center of Turkey, of its Muslim faith and culture.

And above the City stands the dome of the eternal and majestic *Hagia Sophia Church (the Holy Wisdom)* surrounded by the minarets of the mosque in which it was transformed. Now, it houses a museum of international fame. There you can see the ancient Christian frescoes that were neither destroyed by the invading Sultan nor by the following leaders. That is amazing because the Koran is totally against all idolatry. We are all very grateful for this gesture of tolerance: this art represents the best that many people of several generations could give of themselves. Further, Istanbul could once again become the capital of Turkey because Ankara, its current capital, has very reserved seismic forecasts.

EXAMPLE: A very strong social law with great international coverage establishes that sex hormones are to be enjoyed. Well, many Christian men have found that this combines well with their life routines. That is, they promise eternal love to their girlfriends and go to bed with them. But they throw them away like a spent gum when they get bored, or when problems arise, or when a new and intense romance knocks on the door. Has God looked from heaven on their iniquity?

COUNTER EXAMPLE: I have found in different cultures and religions many people who don't give up themselves to hormones, technology, money, power, the fame of the quarter-hour, or glory. Besides, I have seen people who have had to abandon their jobs, or their studies and their future, to continue adorning the garden of God that He personally takes care of. What a beauty!

These are all isolated cases, not repeatable. There is here nothing social.

COUNTER EXAMPLE: I have seen several Christians who, having tried politics, flee from it because the political environment demands to get corrupt or to end up isolated and without any influence. Or assassinated.

EXERCISE. Research over the Christian Minister Martil Luther King.

DILEMMA: Many Christians flee from politics to avoid moral contamination. As a result, people that do not fear God get in charge of making the law. So, these make laws that name them as the example to be followed. Therefore, after some lag, the whole country is as they are. That means that the Christian teaching is taken by children as extremely retrograde and against lawful procedures. Under some regimens, as in the former Soviet Union, this amounts to jailing and torture of parents.

So, let's ask ourselves openly: What does the Gospel say about revolutions, and more generally about the interaction between politics and believers?

We can clearly answer the question if we imagine a passage from an apocryphal, invented gospel, that says:

Shortly before the time of his crucifixion, Jesus was lying on the grass with his head on his crossed arms, and from his dreams a great sigh came out accompanied by a complaint:

We must fight the invader to end the crucifixion because it is a great humiliation for our people.

But one moment: How do we know that this narrative is apocryphal? For one simple reason: Jesus does not go after those who seem to have power (the rulers on duty) but after him, who has the power in reality: the Heavenly Father. In fact, the gospels narrate an episode in which Jesus asks the Father to abolish his crucifixion. This was a powerful political institution destined to seal with blood the punishment for all disobedience and crime. In the passage, the crucifixion clashes with the personal pain of someone whose sole recourse is to appeal to God. And yet, God refused to listen. And as I see, God continues to do the same today, because the pain I see is too much. And yet, those who suffer are strengthened in God:

EXAMPLE: A young woman asked me for change and when I asked her how she was doing, she replied: *Always with God, I always go with God.* And from his face radiated a certain peace and a slight but impressive joy. In a very different style comes a lady who uses to ask me for water, and while she waits, she is arguing with someone invisible about how much he oppresses her. When she has received the water, she always tells me: *God bless you.* And I accept her blessing with joy because I know that it is to her that God gave the keys to the door of heaven.

COUNTER EXAMPLE: The social power of Christianity is amplified when the Christian faith joins the power of the State. Has this been done for good? It is doubtful because history presents abundant cases where such power is used to steal, kill and destroy without measure. An african report says: *They came here with the Bible while we owned the land. Later, we had the Bible and they the land.*

Should we conclude that the social aspect of Christianity is null else nocive? No, it is not: the Gospel proposes us to live the power of the salt: many Christians, like molecules in the soup, scattered between the world and its values. What is our mission? *Do not return evil for evil but overcome evil with good.*

152. Your notes illustrate points of view on the interrelation between the individual and his group and the latter with all individuals. In particular, you argue that an individual alone cannot do anything other than follow the behavior imposed by the great mass. It seems something negative. But every revolution hopes that this interrelation can become favorable for everyone to the point that each one longs for being part of new creative structures. Isn't this precisely Kauffman's point of view in proposing his theory to explain the origin of life?

Yes, effectively. The life we know can be seen as a machinery that allows evolution. Usually, evolutionists tend to think that such systems could be formed by chance, and evolve as rather rare events. But Kauffman claims that this ideology is the same as that of a poor man who wants to become rich. In contrast, a rich man does not dream that he will be lucky. What he does is to use the existing advantages in his society to build companies and businesses that are very profitable with certainty. Our epitome of this ideology is Darwin's theory: if there is life with the ability to evolve, it will evolve towards perfection. And it is true if the problems associated with survival are simple. It is infallible.

Kauffman and also the works of the hypercycle of Eigen and Schuster propose that this must also happen in terms of the origin of life: if a great soup is armed with all kinds of molecules in large quantities, and with all the options of temperature and chemical potentials, then very naturally, that is, with certainty, the structures that we call alive will be formed. In reality, there are not many types of molecules needed: nitrogen bases to assemble DNA, peptides to form proteins and enzymes, fatty acids and phospholipids for cell walls, simple atoms, and molecules of different types that are everywhere: sodium, chlorine, potassium, magnesium, iron, copper.

153. How feasible is this theory?

Not feasible at all. There are two great reasons.

First: The Kauffman Universe is ideal for the emergence of all that is possible. Therefore, this theory predicts that there will be many genetic codes in the various geographical patches of the Earth. But the reality is very different: the vast majority of species have the same genetic code and the few exceptions represent variants with very few changes. And in the infinitely many niches of the earth, there is nothing else. And not because it is not possible: the industry has already produced

extended genetic codes that will allow living beings with dozens of amino acids.

Second: any biochemical system that contains catalysis, acceleration of chemical reactions, also has inhibition or deceleration of them. On the other hand, powerful catalysts are complex, while those that cause inhibition are simple. This implies that the probability of spontaneous formation of catalytic agents is very small compared to that of forming inhibitors. Therefore, such a prebiotic system, without evolution, would be doomed to live in an eternal jam. Nothing productive can be expected. However, many low probability events are still possible.

154. Did our life come out of one of such rare events?

No way. To understand it, let's compare the way complexity grows according to the Darwinian Evolutionary Theory and according to Kauffmann. In the first, the formation of complexity is similar to the process of a painter who uses a brush to add oil to the canvas. But Kauffmann's theory is different: cover the entire canvas in black using Chinese ink and do not paint but erase. But as much as the styles are different, both have in common the specificity to work the detail, which is inevitable. Therefore, the struggle of each process against complexity must have a long history of mediocrities that, concerning biology, is not seen in the fossil record or our anatomy or physiology. In other words, applying Kauffmann's idea to facilitate the development of software - the genome is software - could solve the task in some cases, but it must not be a panacea that leaves engineers without work.

In reality, one uses both techniques at all times: the solution to any problem is to give a group of variables an appropriate value. Well, regarding variables of the same type, one initializes them by giving them all the same value (that seems to paint everything in black) and, along the process, one is giving them more appropriate values (similar to painting with a brush). This is always done and yet the complexity of software development remains a well-paid source of employment.

155. If someone wanted to work on this issue, is there anything to do immediately?

Yes. We have tested many variants to elucidate if evolution can somehow untangle a thread in 2 dimensions. We have been able to see that evolution has no problems with simple entanglements that are faithfully modeled by a random polygon of fewer than 10 vertices, but evolution cannot against a great tangle that corresponds to a polygon of 20 sides or more. Unfortunately for me, all my attempts do not exhaust the possibilities of evolution. It is therefore intriguing to know what other approaches will give of themselves. Someone might give evolution the chance to triumph over entanglements. That would show that all my accusations against evolution are false: depleting the imagination of a human being does not mean depleting the possibilities of evolution.

But to turn this protest into an action plan you have to start somewhere. To anyone interested in the subject, I propose an idea that I have not worked myself: to untangle a thread you have to turn it into a convex figure everywhere. A regular polygon is a perfect example, and it is the one that one instinctively seeks when trying to untangle the thread. Therefore, we must review the literature (or the programs that I have used) to see how convexity is measured and thus be able to give evolution the task of maximizing it and see if, as a side effect, the threads are detangled.

I would be very surprised if convexity gives something. But on the other hand, the side effects never stop producing both wonders and accidents, and thus we see in the industry and medicine applications of results from remote areas that solve traditionally challenging problems. That is why I believe that the power of side effects has no limits, both for good and for bad.

156. There is something very confusing that you have not been able to clarify: You say that the Evolutionary Theory is false because your simulations say it. But at the same time, you recognize that your simulations are just a small sample of the possibilities of evolution. However, and despite the uncertainty, you continue to ensure that the Evolutionary Theory is false or, more accurately, obviously false. Are you making use of any prophetic gift, or are you joining Lamarck to make randomness the guided solution to any problem, or what?

The randomness of my analysis is the randomness of my simulations: a sequence of numbers comes at random when you have little or no self-correlation, so you have no idea which will come next. We all agree that this kind of chance captures Darwin's spirit. This randomness is not the chance of Lamarck, for whom life has an innate tendency towards perfection that he generically calls *the power of life* and that is implemented in higher beings as *a nervous fluid*. Thus, a sequence of random numbers in the sense that we grasp of Lamarck should have strong self-correlations.

When we say that the Evolutionary Theory is statistically false, what we are saying is that this theory has a prediction that is false in almost every experiment. The prediction that we like is that if we had appeared by evolution, we should be full of imperfections and at the same time the fossil record full of malformations. Our certainty comes from the enormous number of species that inhabit the earth and that are counted by thousands (some say that by hundreds of millions if we look at all microorganisms). Besides, it has been very difficult for engineers to do things that resemble structures of living beings. Our simulations also tell us that evolution easily fall into tangles when trying to solve problems that are easy for us and, therefore, it is not smart to imagine that evolution could have been the cause

of our existence.

But since we believe that randomness occurs in biology, we cannot exclude wonderful events by pure chance. We can assure, but without raising our voices, that if so, many of these events did not occur given the short time that the universe has existed, less than 20 billion years, and the small amount of material available: less than 10^{100} atoms. All of this is linked to the extreme slowness of life's processes (slower than 10^{-15} seconds). Adding everything, we get numbers that are tiny in the world of combinatorics.

If by chance some wonderful event occurs, one would have to ask: How do I do systematically something like that? Or: What is the algorithm that will generate wonderful events like this? Such algorithms will not be direct simulations of evolution. But when these algorithms are simulated by evolution, something has to change regarding a direct simulation, either in the form of coding, or in the objective to be optimized and checking for indirect results, or in the self-organized environment that you want to explore. We can keep up with these possibilities if we investigate algorithms that study indirect effects, examples of which we have provided. It seems to me that these ideas are more akin to Lamarck's thinking than Darwin's.

157. Let's finish our interview: do you want to add something?

All this has been very difficult for me but at the same time very attractive. Delicious. My goal in sharing my work can only be to show how a human being can fight with his mind so that the demands of his intuition are satisfied. That is, quite satisfied. I hope that my experience will serve those who have similar struggles, especially regarding the relationship of evolution with the true God. Because each person's struggle is personal and each one is a separate battlefield.

158. I also want to add something: You forgot to talk about the gold number. How is that possible? It is something so inexplicable!

Chapter 4

CONCLUSION

159. WHAT CAN YOU SAY TO CONCLUDE?

Evolution is a procedure to solve problems and seek improvements. It consists of a repetition of mutation, recombination and evaluation. Evolution is a majestic reality. In particular, with mutation, recombination and functional tests one can achieve great things. Biology teaches us that living things have everything they need for evolution. The Evolutionary Theory says that species emerged from each other by evolution, due to the effect of mutations and their subsequent recombinations, which were tested by the environment to be perfected, perhaps little by little. In particular, the man was born from the chimpanzee. Although others say that we evolved from the bonobo and that seems more respectable because the psychology of this pygmy chimpanzee is too refined and extravagantly human.

Science has found innumerable ways to support the Evolutionary Theory, to the extent that it is considered an incontestable truth.

On the other hand, the instinct says that the Evolutionary Theory is obviously false because it cannot be true that so much perfection amidst such complexity of living beings has arisen through evolution without leaving the slightest trace of imperfection along the way. We believe that this subjective falsification has three main components: the artistic, the linguistic and the complexity. All of them are well represented in the following perspective that relates Genetics to Computer Science and Programming Languages:

- Each genome consists of instructions for the biochemical machinery that is programmable, that is, *the genome is software* and the CPU is the ribosome.
- *Evolution is a software developer*, which is demonstrated by the immune system of each human being. This system uses evolution to build defense weapons against microbial invaders.

Under this perspective, what the Evolutionary Theory says can be reformulated as follows: *evolution is the software developer responsible for the creation of the software of all genomes*. If that were true, we have several mandatory predictions that are all false:

- Because in the world of programs almost everything is entangled and because with very few mutations a clear program can become a tangle, *the genome would be a software document too tangled to be understood by a human being*. False: it took humans only 23 years since we learned the structure of the DNA until we synthesized compounds of medical interest produced by genetic engineering. This attests to the incredible clarity of the genome.
- Software development is a complicated task that has a very explicit objective formulation: in the absence of mathematical validations made by well-trained groups of professionals, *there is no bug-free software without countless tests*. Or, *there is no software development without bugs*, failed trials, whose solution creates more bugs. Therefore, if the Evolutionary Theory were true, the fossil record should show an evolution of perfection exhibiting mediocrities and malformations everywhere and at all times. This is false: paleontologists love to highlight the perfection of living things that they rebuild from fossils.
- If there were no resource limits, evolution could eventually achieve anything. Even so, it would repeat what happens to human programmers: at the beginning of a project, rapid progress is made, then not so much, then nothing. The product stagnates because any improvement implies coordinated changes in large quantities. In observable terms: one advances very slowly towards perfection and goes through periods of stagnation increasingly longer. Therefore, *in every current living organism, there should be an apparent trace of mediocrity and imperfection*. This is false: just open and close your left hand. And decide: Is it wonderful and perfect?

With that said, we believe that we have demonstrated that common sense is absolutely right: The Evolutionary Theory is obviously false. But one question remains: why is there so much data in favor of such a theory? From my creationist point of view, I propose two possible answers: First: Every software developer uses evolution to make large projects. On the one hand, it is always changing and combining things. On the other, it does something simple first and then complicates and perfects it on the fly. We could infer that The Creator did the same as us to design the genomes of living beings. But, if God is so similar to us, and being that

living beings are so complicated and so diverse, shouldn't they be quite imperfect? Not necessarily: Computer Science has made great progress in the production of almost error-free software. And although it is far from perfection, more and more people preach it, teach it and demand it.

Second: We believe that living beings fit to evolution because we have not developed the opposite point of view, namely: that living beings make up a great project that was then filled with evolution where it was possible because evolution is for complex problems a very limited and expensive tool.

APPENDIX

Acknowledgment: I had decided to end my work on *Java for the Study of Evolution* by September 2018. But during a conversation with Edgar Florez Pinilla in January 2019, he made me an interview. The right combination of amusement and seriousness. It was so nice that it seemed good to me to transcribe it, and to include the appropriate background. Another conversation with him instilled me to include more questions. While working on the text and programs, I figured out that to make a material for cell phones would also be convenient. And so, this is it.

The mentioned **Java programs** come packaged in the file *EntrevistaEFP_LAB3.zip*. To run them, you need a suitable platform (java 8 + Netbeans 8.2) that by 2019 can be downloaded from:

<https://www.oracle.com/technetwork/java/javase/downloads/jdk-netbeans-jsp-3>

More modern versions are also good but might demand more installation work.