

Just a minute! Can everything be mathematised? Does there exist in the world something that could not become the object of mathematical theory?<sup>1</sup>

### *A math movie?*

Just a single letter “ $\pi$ ” –probably the shortest title in the history of the cinema. At the same time, rather perverse and ambiguous: we know that apart from being a particle of one of the natural languages this letter from the Greek alphabet is also a cryptonym of a certain number significant in mathematics. Basically, therefore, the title-letter proves to be actually a title-number. In addition, it is a strange and mysterious number. That last circumstance could prove to be even more curious. We remember from elementary school mathematics that  $\pi$  describes the ratio of a circle’s circumference to its diameter, is constant, and – in an approximation needed for the purpose of calculations – totals 3,14. What is so extraordinary about this? For those whose mathematical knowledge does not exceed the elementary level (and be honest – that means for the majority of us) the answer is: probably nothing.

For mathematicians, however,  $\pi$ , once also known as the Ludolphian number,<sup>2</sup> does not cease being puzzling and disturbing, and remains a challenge for the inquisitive analytical mind. It turns out that its expansion after the comma is not a recurring decimal; in other words, no constant regularities can be observed in its course. Although it pertains to definite objects the number  $\pi$  is indefinite. It is also irrational. Despite the fact that with the assistance of the computer billions of numbers after the decimal comma have already been identified,<sup>3</sup> a complete and finitely closed sequence is still missing. So far, everything seems to indicate that it is uncountable. The sequence of numbers after the decimal comma is infinitely open: writing down all those numbers would take up an eternity.<sup>4</sup> Putting it succinctly: due to its very essence  $\pi$  aims at infinity.

For science  $\pi$  does not cease being an enigma. Although it appears to be a purely human construct it is regarded as a number from beyond human order. The biologist Darryl Rainey drew attention to the amazing affiliation between mythological imagery and mathematical intuition indicating the relations of the circle as a basic figure in the mythologies of assorted cultures and the mysterious value of  $\pi$ . The number 3,1415926... is infinite, and in mathematics constitutes the so-called value  $\pi$ , the ratio of a circle’s circumference to its diameter. Looking at a circle we see one of the most constant values in mathematics. We may ask whether it is an accident that the circle is a symbol regarded in the myths of numerous cultures as the most magnificent and impeccable. Carl Jung was of the opinion that the mandala (Sanskrit for circle,

## Cipher and Epiphany. Several Remarks on $\pi$

hence the motifs containing this scheme) is the most important religious symbol of mankind. Whenever the inner eye looks at a circle, e.g. a mandala, and gains the impression of perfection, then it sees the infinite number 3,1415926..., albeit from another level. It is quite possible that we correctly describe such numbers as transcendental.<sup>5</sup> Therefore,  $\pi$  contains the idea of perfection and completeness and carries the promise of transcending beyond the finite, temporal dimension. Within the context of such statements it becomes less surprising that scholars decided to establish contact with extra-human intelligence, and in the hope of coming across a non-terrestrial civilisation transmit into space numbers of the decimal expansion of  $\pi$ .<sup>6</sup> Apparently,  $\pi$  evades simple assignments and is situated somewhere along the border between “hard” science and quests that we are in the habit of describing as “paranormal”. From the cultural point of view its presence in both domains is important. There can be no doubt that our ordinary schoolroom: “three/fourteen hundred and sixteen” possesses a secret profoundness and an almost hypnotically powerful impact.

Regardless, therefore, of its purely mathematical parameters the number  $\pi$  has attained a certain autonomous value in contemporary symbolic space. The same thing happened to it as to Einstein’s famous equation:  $E=mc^2$ , whose mythological value was brilliantly disclosed by Roland Barthes. Both the brain of the creative physicist and his immortal product were rapidly inserted in the old esoteric image of science. The equation gained the status of a magic spell opening the door to the Sesame of wisdom: *There is a single secret to the world, and the secret is held in one word; the universe is a safe of which humanity seeks the combination: Einstein almost found it, this is the myth of Einstein. In it, we find all the Gnostic themes: the unity of nature, the ideal possibility of a fundamental reduction of world, the unfastening power of the world, the age-old struggle between a secret and an utterance, the idea that total knowledge can only be discovered all at once, like a lock which suddenly opens after a thousand unsuccessful attempts.*

*The historic equation  $E=mc^2$  by its unexpected simplicity, almost embodies the pure idea of the key – bare linear, made of one metal, opening with a wholly magical ease a door which had resisted the desperate efforts of centuries.*<sup>7</sup> Somewhat similarly to Einstein's equation the mysterious and unsolvable  $\pi$  functions at present as a sign of something more than a purely digital characteristic. It offers a tempting promise of breaking the code of "visible and invisible things" and of solving the mystery of existence. This key seems to be even simpler and less sophisticated than Einstein's equation: it suffices to merely discover certain regularity in the decimal expansion of  $\pi$  and we shall attain the threshold of the secret. The cultural significance of "3,14" bypasses the whole complication and finesse of mathematical calculations and has been as if added "above" the number itself. Unclear and puzzling, surrounded with a certain emotional aura, it became one of the recognisable numbers of contemporary anthology. In one of his interviews Darren Aronofsky admitted:  *$\pi$  has always fascinated me as a number. It's a really wild concept.*<sup>8</sup> His film consciously refers to numerical mythology.

At the very onset let us exclude a certain misunderstanding that could emerge in the course of watching the film. Despite distinct cognitive ambitions and certain necessarily abbreviated references to numbers and mathematical searches this is no "math film", as film critics sometimes describe it, that would aspire to compete with mathematics taught at university. To put it in plain terms: the film might be quite boring and obvious for the average student of mathematics just as it could prove to be boring and obvious for every person with an even average knowledge of the secrets of Cabbalistic gematria. It is difficult to believe that such persons would regard information about the existence of the Fibonacci sequence or an elementary presentation of the principles of gematric correspondence as discoveries. One can, however, assume – and this is not an excessively light-hearted premise – that the percentage of mathematicians and Cabbalists in each population is not very high and, consequently, relatively low among the film audience. Aronofsky certainly did not produce his film with them in mind. The recipients are aptly described by the authors of an excellent book on the construction of computational complexity: the majority of people with at least elementary scientific training disclose an astonishing belief in the power of mathematics, envisaged as a tool that makes it possible to calculate the very essence of reality. One and one are two regardless whether we add ounces of flour or gunshots. The ratio of a circle's circumference to its diameter is a mathematical constant and the magical number  $\pi$  (3,1315...).<sup>9</sup> The film refers to precisely such a state of common consciousness. It is not a presentation of mathematics intended for mathematicians (just imagine such a plot!) but of

mathematics in a simplified dimension, a popular vision.

Aronofsky is perfectly well aware of the fact that the presented level of mathematical knowledge is rather unsophisticated: *It's pop math, really, everyone bought Chaos, that chaos book that everyone got stuck on the first three pages and then it became a doorstop or something. That's what the film is. It's like the first three pages of those cool math books.*<sup>10</sup> A brief and, of necessity, superficial introduction to the world of numbers and Cabalistic calculations – remember that the cinema cannot stand lectures – is composed of merely slogans, call signs of the problems announced in the film. This is the beginning of a thread that we can follow in order to reach the heart of the story. Aronofsky does not resolve mathematical equations but uses an analytical probe to examine the state of contemporary awareness. That is his real theme.

The début film contains a distinctive stylistic signature. The rather simple story about an accomplished Jewish mathematician is told brilliantly. Aronofsky inscribes serious reflections about the condition of contemporaneity into a rather trivial scheme of an ordinary thriller. Nonetheless, he does so with enormous virtuosity. The convention of a thriller is treated with a certain distance and we are actually dealing more with a pastiche. What sort of a thriller is this in which a dubious Wall Street gang wishes to win the cooperation of a famous mathematician, and in which the thrills are produced at best by his periodic migraines? And yet the film adheres to the elementary determinants of the genre. The selection of such a convention and style of telling a story is, on the one hand, a film homage paid to the cinema of genres and, on the other hand, a vehicle that is only to tempt the spectator.

Aronofsky's ascetic and formally disciplined film builds an extremely evocative world of madness and hallucination. Numerous cuts produce an impressive and violent image capturing the senses and intensively penetrating the mind. Maintained consistently in a kaleidoscopic, uneven rhythm it matches ideally the progressing insanity of a brilliant mind, a process occurring right in front of us. The spectator is instantly compelled to examine reality through the eyes of a madman whose desperate and fragmented mind is vividly visualised by the frames of the depicted world, sometimes blurred and "upside down". If this is expressionistic poetics, and numerous stylistic elements indicate that this is the case, then it should be described more accurately as "hysterical expressionism".

This is a claustrophobic world, cramped and tightly clamping the protagonist's head in the manner of a steel band. The black-and-white tape and the sound track recalling indistinctly articulated industrial *murmurs, clusters and sequences* reinforce the impression of alienness, the unreal quality of the portrayed reality.

New York in  $\omega$  is a space of alienation and fear. Totally different from the warm and nostalgic New York in Allen's *Manhattan*, it is filmed as a city-Moloch without any of its emblematic buildings but with unattractive streets and empty, suspicious looking subway passages. In contrast to Auster's *Brooklyn Boogie* with a local community of residents sharing daily, mundane problems we are shown a community devoid of all bonds; each person lives on his own and for himself, each takes part in an isolated world of nomadic beings. This is a gloomy, dark, and cold world. Or, in reference to the film's Cabbalistic motif, it is a world of broken vessels, a distant echo of *shevirat ha-kelim*, remote but maintaining a connection with its source.

### All is number

Now, return to numbers, that astonishing cosmos of beings with a curious ontology. Only habit forces us to seek knowledge about the nature of contemporaneity in books written by researchers specialising in culture. After all, they too – whether they know it or not – are in the grasp of a paradigm, which they try to describe and analyse. Contrary to the meta-descriptive character of science they do not succeed in performing the Baron Munchhausen trick all that often. Sometimes, intuition preceding the findings of those who deal with culture professionally is preceded by literature. In Bohumil Hrabal's excellent autobiographical essay the enthralling motif of the number appears upon several occasions.<sup>11</sup>

Hrabal's intuition reactivates daily reality but also places it in another light. We live in a world composed of numbers. Every day we move in space peopled with numbers. The hypertrophy of numbers each step of the way, almost everywhere, is so great that we almost fail to notice this fact and accept it as "natural" and as something that does not require reflection. Everything is weighed, measured, counted, as if contemporary culture had written its (ill-bidding?) *Mane, Tekel, Fares...* in all possible places and with multiplied effort.

What are these numbers? What is their nature? What does it mean: "our epoch is expressed only in numbers"? Had we, unconsciously, returned to old Pythagorean intuitions according to which the world is a number and can be described and comprehended *via* numerical relations?

The writings of Pythagoras of Samos are non-existent and their content is known only from secondary sources. Therefore, recall the concise and apt characteristic of Pythagorean ideas contained in Aristotle's *Metaphysics*: *The so-called Pythagoreans, who were the first to take up mathematics, not only advanced this study, but also having been brought up in it they thought its principles were the principles of all things. Since of these principles numbers are by nature the first, and in numbers they seemed to see many resemblances to the things that exist*

*and come into being-more than in fire and earth and water (such and such a modification of numbers being justice, another being soul and reason, another being opportunity and similarly almost all other things being numerically expressible); since, again, they saw that the modifications and the ratios of the musical scales were expressible in numbers; since, then, all other things seemed in their whole nature to be modeled on numbers, and numbers seemed to be the first things in the whole of nature, they supposed the elements of numbers to be the elements of all things, and the whole heaven to be a musical scale and a number. And all the properties of numbers and scales which they could show to agree with the attributes and parts and the whole arrangement of the heavens, they collected and fitted into their scheme; and if there was a gap anywhere, they readily made additions so as to make their whole theory coherent (I, 985 b and sqq.).*

In other words, Pythagoras and his followers regarded the number as sacred (to mention perfect numbers or *tetraktys*) and as a tangible confirmation of the wonder of the divine-human world. In the spirit of the two halves of the Greek *symbolon* it was a keystone linking two realities. The Pythagorean maxim: *all is number* meant that the number was conceived as the beginning and the end, the pre-foundation, the *arche* of the whole comprehensible reality. In this magical-religious conception the cosmos of numbers created, slightly in the manner of Platonic *paradeigmata*, a world of ideal pre-models. The number makes possible cognition and leads to the discovery of the truth of reality. The condition for learning anything from existing things is pre-established harmony, the model of measure and proportion. Harmony is the source of the organisation of the world since we can become familiar only with that, which is orderly.

Hrabal's enumeration seems to suggest that the reality in which we live is Pythagorean, albeit *à rebours*. In daily experience the number fulfils only pragmatic, orientating functions. More, it conceals the truth of the thing despite the fact that according to the intentions of the collective, anonymous author, numerically marking all and everyone, the number was supposed to cast light on truth and accentuate and confirm it with an undisputed mathematical certificate. The number often becomes the name of a thing, its variable replacement (not to mention people-numbers from the horrific past of concentration camps). Those numbers from our daily life offer a semblance of precision, a commonplace equivalent of a scientific interpretation of the world. The aphorism created by common sense about the existence of small lies, big lies, and statistics corroborates this obvious fact by means of its curious gradation. The world of everyday experience is a world of numerical illusion. It creates a vast space built of numbers, a monstrous – in both meanings of that word – *simulacrum*. To put it more explicitly: it is

an unintentional joke about the eternal claims to precise reasoning made by mathematics and the desire to offer a true description of reality. The daily world full of digital references is a perverse variant of Pythagoreanism. True, we “actually” live in an anti-Pythagorean world. For us a number deprived of all sacral references fulfils the function of merely an ordinary identifier. It is a firm scaffold supporting elementary orientation in the world, without which life appears to be impossible. After all, it would be difficult to say that behind those orientation indices there stands some sort of cosmic harmony that binds all and everyone. The numerical world plays rather the role of a protective umbrella and is one of the means that tame the unknown and provide an illusion of controlling things.

Heidegger accused contemporary science of a similar attitude. Science, he claimed, does not think, but calculates. The effect of such an approach is a purely subjectivising attitude towards things. *Nature and history become the objects of a representing that explains.*<sup>12</sup> He who counts and subjectivises being seeks predominantly certainty.

Heidegger also drew attention to the fact that today the essence of the material is defined primarily by numbers. Meanwhile, the Greek *ta mathemata* originally denoted that, which is known *a priori* to a person co-existing with things, i.e. the corporeality of bodies or the plant-like character of plants. The same holds true for numbers. Discovering three apples on a table we know that there are three of them because we already knew the number three, “tertiary nature”. It is precisely in this non-quantifying sense that it is mathematical. Contrary to school routines mathematics does not find fulfilment in the vulgar gesture of counting and calculating: *Mathematics is mathematisation, to paraphrase Heidegger's celebrated: die Sprache spricht. It is thus both the conception and the birth of something essential (i.e. beings) “produced” by mankind and at the same time viewed and contemplated. It is theory, theorein – creative imagination.*<sup>13</sup> Let it be stressed clearly: in its innermost, spiritually comprehended act mathematics is essentially contemplation.

### ***The mad geometrician***

Max Cohen, a brilliant Jewish mathematician, is obsessed with the world of numbers. He concentrates his entire life on studying numerical functions and finds fulfilment in mathematical calculations. Consumed by this preoccupation, he spends whole days in front of his super-computer in the hope of discovering a secret sequence of numbers describing the order of the world. Apparently, the old Pythagorean intuitions have found in him a brilliant performer. Cohen undoubtedly displays a reverent attitude towards numbers and their explanatory properties. The point of departure of the celebrated syllogism consists of three

premises: 1. Mathematics is the language of Nature, 2. The world can be presented and comprehended with the assistance of numbers, 3. Diagrams of system numbers reveal regularities. The conclusion is as follows: Nature is the domain of regularities. Evidence for their existence can assume the form of a number of phenomena whose occurrence seems not to be subjected to any regularities: recurring disease epidemics, the wax and wane of caribou populations, sunspot cycles or the rise and fall of the Nile. In each of those natural phenomena, at first glance chaotic and without any conspicuous order, it is possible to trace periodic repetitions.

Cohen discerns regularities in almost all natural phenomena and the arts. In this respect, detailed proof is supplied by the intriguing presence of phenomena from assorted orders, numbers from the so-called Fibonacci sequence (1, 2, 3, 5, 8, 13... etc., each successive number being the sum of the two previous ones). Fibonacci numbers actually occur universally in Nature: leaves on branches grow at intervals, whose relations correspond approximately to the relations of Fibonacci numbers. Numerous flowers have a permanent number of petals: lilies – three, buttercups – five, calendulas – 13, asters – 21, etc., with all numbers belonging to the above-mentioned sequence. Sunflower seeds are arranged in the shape of spirals: as a rule, there are 34 dextrorotary spirals and 55 laevorotary ones, and both numbers come from the Fibonacci sequence. More: the quotients of two adjoining numbers from the same sequence (e.g. 144:133) consistently approach the golden ratio coefficient to be found in numerous examples of architecture (the Parthenon, the Pyramid of Giza); the golden ratio was applied by Leonardo ... It is simply impossible not to assume that numbers or, more exactly, certain particular numerical sequences govern the world.

Cohen becomes intrigued by the question whether stock market predictions are not subjected to identical dependencies that can be calculated. A world order, if it exists, must reveal itself not only in Nature but also in the world of human activity. After all, if one takes a closer look at the stock market it becomes apparent that it too is some sort of an organism. Just like a natural organism it is subjected to the law of growth and necrosis, and incessantly changes. The fact that it is a permanently living network legitimises a new hypothesis: the stock market is governed by a certain pattern concealed by numbers, a constant algorithm that has to be deciphered. Cohen embarks upon countless attempts to discover a numerical sequence describing the chaos of stock market oscillations of the prices of stocks and shares. The unearthing of this magic formula would mean not only comprehension of the present-day state of things but also the possibility of predicting future results on the stock market. The

goal appears to be quite close but Cohen's computer does not tolerate the calculation overload. The row of numbers appearing on the screen a moment prior to the collapse seems to be accidental. The printout with an incomprehensible sequence of slightly more than 200 numbers lands in a wastepaper basket.

Cohen's innovative works on statistics written during his early youth become universally known. His mathematical talents are so valuable that he unexpectedly becomes the object of interest of two entirely different milieus. He is pursued by analysts from a forecast office at the New York stock market and by a certain rather suspicious character named Lenny Meyer, who turns out to be an envoy of a Chassidic sect. Meyer presents the elementary principles of Hebrew gematry, according to which each letter corresponds to a certain numerical value. He cites the example of the Hebrew version of "The Garden of Eden", which in a numerical transcription totals 144, and "The Tree of the Knowledge of Good and Evil" – a total of 233. In passing, Cohen notices that these are numbers from the Fibonacci sequence. Meyer likens the Torah to a cipher given by God, a holy writ with an unclear message that calls for exegesis. The Torah also contains the Name of God composed of 216 numbers but, unfortunately, the key to it had been lost. The situation becomes complicated and it appears that there is no return. Cohen starts to assume that there exists a single regularity governing reality as a whole. It could be applied not only in the case of the stock market but also to describe an essential characteristic and, finally, as a numerical cryptonym of God's name. He does not heed the warnings of his mentor – *you will start to see numbers in everything and as soon as you discard scientific rigor, you're no longer a mathematician, you're a numerologist* – and becomes immersed in his obsession with numbers, imagining that he is a mere few steps away from discovering the contemporary Holy Grail. Insanity is close.

For the Cohen *dramatis persona* Aronofsky applied a certain essential Faustian motif: insatiable desire for knowledge. But is Max Cohen simply a present-day Faust? Undoubtedly, his story contains distinct echoes of the Faustian myth.<sup>14</sup> Apparently, Cohen's Faustian traits constitute an interpretation trail not so much misleading as unaware of what is most symptomatic in this character. We are tempted to perceive the brilliant mathematician through the prism of the land surveyor from Kafka's *The Castle*, who resembles him in many respects. The heart of the matter is not merely a simple directive that could guide us to such a trail: after all, Cohen's computer is named "Euclid" after the great legislator of geometry. There are also more important reasons: Cohen is not concerned with knowledge conceived as the growth of information. He wants to introduce order into reality, to capture it in

numerical parameters, to describe it with a digital sequence. In an excellent exegesis of *The Castle* Walter Hilsbecher, who perceives this novel predominantly as a drama of an impatient mind, describes the meaning of the work performed by K: *His profession consists of introducing order into that, which is disorderly, of measuring and dividing land and metaphorically: in the introduction into the uncertainty of being a particle of certitude, a guarantee of order, of granting structure to that, which is distant from structural order, and contours to that which is deprived of them, human contours comprehended in the manner of men and accessible to man.*<sup>15</sup> Their prime aim is also similar – here the homonym of the Polish word: *zamek* proves to be helpful – to open a lock (*zamek*), i.e. to decode, and to capture a castle (*zamek*)...

Both experience their profession as a calling of sorts. Cohen seems to be chosen by the very fact of possessing a brilliant mind, a feature that gradually intensifies. The longer he works on discovering numerical regularities the stronger the feeling of a vocation (in a discussion held with a rabbi he shouts: *The number is nothing. It's the meaning. The syntax. It's what's between the numbers. You haven't understood it. It's because it's not for you. I've got it. I've got it! I understand it. I'm gonna see it. Rabbi, I was chosen.* The characteristic of K is similar: *He is a land surveyor. Nothing indicates that he would ever resign from the right to measure land, to carry out his profession, to fulfil his vocation (in a dual sense: also in the one stemming from the fact that the castle 'called' him). He is a man whose calling is to measure the unmeasurable even though it would prove impossible to be measured. It is precisely the unmeasurable that calls him and tempting him evades him – just like the castle.*<sup>16</sup>

Hilsbecher proposed an extremely original interpretation of the meaning of Kafka's castle, the object of the land surveyor's admiration: *The castle is the centre, the inaccessible stronghold of the irrational, which challenges ratio and evades it, the principal and contemnor of ratio, an extraordinary reality (judging by the effects) and mirage. The key to its secret remains unapproachable and the battle is waged in the forefield.*<sup>17</sup> It would be difficult to seek a more adequate description of the sense and goal of Cohen's hopeless quest. Similarly, a characteristic of the surveyor's personality is an adequate portrait of the behaviour of Max Cohen: *K. is a man who takes things to heart. Since he frets about life his very existence becomes a heavy burden. He suffers because of existence, its non-transparency and irrationality, although it is precisely the immeasurability of being that should be a cause for merriment. This is not to say that he should resign from his attempt at rationalising: this is his calling. But he treats it much too seriously and devotes all his zeal, causing him to be suspected of impatience. Impatience is one of the cardinal sins.*<sup>18</sup>

Hilsbecher aptly extracted K's deadly sin: impatience. By introducing into his remarks the aphorism formulated by Kafka in *Reflections on Sin, Suffering,*

Hope, and the True Way, he commented the significance of the surveyor's failure: "It was because of impatience that they were expelled from Paradise; it is because of indolence that they do not return", Kafka wrote about people. Then he corrected himself: "Perhaps there is only one cardinal sin: impatience. Because of impatience we are driven out of Paradise; because of impatience we cannot return".

What did their impatience consist of? They wished to know. And in order to know, they ate from the Tree of Knowledge.

Did Kafka, while performing a *salto morale* of resignation thus condemn the desire for knowledge, ratio? This assumption is negated by K.'s resentment of the peasants' comatose state and by his vocation. An impatient longing for knowledge is the essence of people's "cardinal sin". Who can say that access to the tree of knowledge has been refused for all eternity? Or that patience will not be rewarded by a slow alleviation of the prohibition, a slow maturity towards cognition? This is certainly an infinite process but patience could offer it peaceful progress. (...) Ratio also must develop and the possibilities of its employment have to be carefully considered; it too must control itself – oppose the danger of conceit and impatience, mindful of the fact that it is traversing an endless path.<sup>19</sup>

This pride and impatience are confirmed also in the most important story, a *sui generis* biographical myth of Cohen: *When I was a little kid, my mother told me not to stare into the sun. So once, when I was six, I did.* As a result he almost became blind and started suffering persistent headaches, which recurred when he was an adult. This story, however, can be interpreted less literally and in a symbolic perspective be seen as a pre-figuration of essential moments in the boy's later life. Hence the legible motifs of the Sun and the violation of the prohibition will become a discernible film variation of the tragic myth of Icarus. Cohen certainly possesses some of the traits of Faust. But an even more apt characteristic seems to be: a geometrician with the Icarus complex. It is difficult not to notice that the protagonist of  $\omega$  bears the same sort of tragic stigmata, a pre-established fatalism.

### A Great Code

Films do not arise in a mental void. To a lesser or greater degree they are a visual exteriorisation of that, which is "in the air", with which contemporary thought is concerned. The questions that  $\omega$  proposes for consideration coincide with a special moment in Western culture. For some time since the discoveries made by Crick and Watson we have been aware of four basic components of the genetic code and the relations between them. We are also familiar with a model of the atom discovered by Rutherford. Today, the years-long project of deciphering the biochemical contents of the human genome is coming to an end.

A group of outstanding Jewish mathematicians has announced the outcome of its research – up to now not undermined by anyone – into the existence of a Biblical code. Certain physicists maintain that the so-called general theory of everything is already within our reach. We live at a time of impatient expectation. We are waiting for the breaking of the last code, the removal of the last seal from a parcel containing data about ultimate meaning. Apparently, we believe that we are participating in the final act of a great drama of depriving the world of its secret. The curve of cognition is asymptotically coming close to the line marking Truth, and almost touching its edge. One moment more and the impossible will become the possible. There will come a time of great decoding. The revelation of all mysteries and the announcement of the sense of Everything – those are the legible signs of ultimate times. The Greek *apocalypsis* means "revelation" but also the "disclosure" of the meaning of a certain secret. It is also in this etymological sense that we can describe the present-day moment in culture as a time "just before" the apocalypse. Aronofsky's film without doubt intentionally refers to this state of the awareness of the contemporary world. The director has brilliantly sensed the atmosphere of anticipation for a spectacular *grande finale* dominating in the Western world, and has noticed an almost universal Kafkaesque impatience, that deadly sin of mankind. Aronofsky, a New York Jew from Coney Island, attaches particular importance to the discovery of Biblical codes in the Torah and the ensuing intellectual foment (together with its eschatological subtexts) amidst the Jews of America and Israel.<sup>20</sup> This was, he confirms, one of the essential points of departure for the construction of the scenario.

And yet the answer proposed by Aronofsky as regards the necessity and possibility of cognition appears to be distant from unambiguity.

First take a look at several doubts.  $\omega$  forces to tackle a number of elementary questions concerning the nature of reality. Does Someone send us letters written in invisible ink and telegrams with an unclear content, or do we grant them meaning by asserting *ex post* that these are communiqués "not from this world"? Doing so, we submerge ourselves in signs that we had produced, rather unconvincing proof for the existence of a Source dispatching coded letters in bottles. In other words: does reality disclose holy contents in an unknown language requiring interpretation and behave like the Delphi oracle that "gives signs", or is the world suffering from an ontological muteness and all that we decipher from it tells us exclusively about the contents of our cognitive apparatuses? To put it in yet another way: is Someone really writing texts in a secret language addressed to us – in that case reading them seems to be a serious undertaking worth the

effort – or does this correspondence have the same author and addressee and thus all endeavours at decoding its transcendent sense resemble a tragic farce? A genuine metaphysical horror.

The rationalistic decree describes doubts of this sort as childish. While discussing man's "hermeneutic" inclination towards deciphering profound meanings produced by the world Leszek Kołakowski defended the stance of the "cryptologists" and "coders". He conducted a fervent polemic with the Enlightenment tradition, which imposed harsh restrictions upon questions of this sort: *We have never stopped asking such questions, and most likely never will. We shall never be free of the temptation to perceive the universe as a book in secret code to which somewhere there is a key... And why indeed should we want to be free of this temptation, which has proved the most fruitful source of cultural growth in all civilizations except our own (at least insofar as its dominant trend is concerned)? And what is it that confers supreme validity on the verdict that forbids us this research? Only the fact that our civilization, that has to large extent abandoned this, has proved immensely successful in some respects but in many others it has failed pathetically.*

*One might ask why, if the universe is indeed a secret book of the gods with a coded message for us, this message is not written in ordinary language rather than in hieroglyphics whose decoding is discouragingly arduous and, above all, never results in certainty?*

*But this question is futile for two independent reasons. First, it assumes that we do know, or can imagine what the universe were like if its message and meaning were clearly readable and unambiguously displayed before our eyes. But we do not know this, and we lack the kind of imagination. Second, it is possible that if we knew why the message is hidden, or partly hidden – that concealment of the reasons for which it is hidden is a necessary part of its being hidden.<sup>21</sup>*

Naturally, Kołakowski is right. The temptation to treat the world as a code, a puzzle to be solved, appears to be a non-reducible disposition and no Enlightenment-era decrees can alter a single thing. After all, we can ask whether it follows that in our task of reading the "sacred ciphers" we are doomed to only two possible hermeneutic stands: the optimistic vision, whose sign could be Champollion, and the degenerate version, whose emblematic figure is Däniken? Is there no other way out than those two possibilities? Must the deciphering of "holy signs", the reversal of the matter of reality "to the right side", be always accused of naïveté and suspected of gnostic pride and cheap exclusivism? A certain response is offered by the final, ambiguous and symbolically open scene of the film,<sup>22</sup> whose entire force comes from the fact that it is also semantically open.

Having already completed homemade "lobotomy" (the removal of a mysterious bulge from his temple) and thus having ended his suffering, Max Cohen sits

in front of his house. He gazes upwards with a rather absent, otherworldly glance, observing, as he did once before, branches swinging in the treetop. A shaft of light is trapped between the branches. It is this image that previously suggested the existence of patterns in Nature. But this time things are not the same. They have become an illegible hieroglyph, an equation without clear-cut properties. Cohen's face, however, lights up with a mysterious smile. Enlightened ignorance? This "comprehending" smile appears to contain knowledge about the hopelessness of efforts aimed at interpreting the mystery of the world in a numerical algorithm as well as a conviction that despite serious premises the world is not a key to the code. The sense of a thing does not have to be concealed and sometimes appears within the range of sight. The response to the world-code is the world conceived as epiphany. We witness an almost alchemical and spiritual transmutation: as if the Tree of Knowledge changed at this exact moment into the Tree of Life. Cohen seems to finally understand the teachings of his mentor, Robeson, who while playing go drew his attention to the need of not thinking too much, indicating intuition as the key to profoundest cognition.

Now the heart of the matter is not to perceive the world as a code, a puzzle, and a hieroglyph to which one matches a key, gives the correct result or produces an adequate translation into a comprehensible language and thus reduces the unknown to the known and actually appropriates the mystery; it is a special sort of "reading". This process of reading and deciphering has nothing in common with decoding a ciphered message. We use the conceit of a code in those situations when we know that the concealed meaning can be basically, sooner or later, grasped. It consists rather of an exteriorisation of the spiritual message, entrusting its secret and following its voice. Deciphering is not tantamount to breaking a code, the destruction or deconsolidation of a secret. On the contrary: deciphering the world revealed in a hieroglyph respects the existence of the secret and its essential imperviousness to any sort of explanation. To "read" the hieroglyph in the above-presented fashion means to continue existing in the interior of the secret, to be not before it or in relation to it, but within it.

There exists such a meaning of reality that cannot be calculated and enclosed in a numerical formula. There also exists such a meaning of reality whose private deciphering does not provide convincing intersubjective proof that something is really "there". There is also such a meaning of reality, which cannot be resolved as if it were a puzzle but can be comprehended by intensive, earlier prepared perception. In order to be cognitively productive the latter must possess all the features of ecstatic contemplation. It seems futile to add that the condition for such contemplation is

total and unconditional impartiality. Thanks to it, and in it, one can simply see sense that does not succumb to discursive tooling or numerical calculations. Rilke's *Introduction to The Book of Images*, and in particular the captivating fragment that literally concerns the act of seeing a tree, is an excellent account of such experience and its essential impermanence:

*Whosoever thou art! Out in the evening roam,  
Out from thy room thou know'st in every part,  
And far in the dim distance leave thy home,  
Whosoever thou art.  
Lift thine eyes which lingering see*

*The shadows on the foot-worn threshold fall,  
Lift thine eyes slowly to the great dark tree  
That stands against heaven, solitary, tall,  
And thou hast visioned Life, its meanings rise  
Like words that in the silence clearer grow;  
As they unfold before thy will to know  
Gently withdraw thine eyes.*<sup>23</sup>

The glimmer of momentary illumination reveals – yes, reveals, and the ambiguity of this verb is significant – the sense of the Whole, shattered into fragments and thus earlier inaccessible. Emerging from darkness it glistens for the blink of an eye in the fissure of concealment, and then returns to it. The fleeting character of this experience and its, by the very nature of things, passing nature does not in any way diminish its poignant reality. Contrary to assorted idealisms, the truth – naturally, not in its aletheic meaning but according to an adequacy comprehension – is not concealed somewhere in an inaccessible cocoon of the noumenon nor does it lie “beyond the horizon”. It is given “here and now” in rare revelations, in viewing that annuls the customary subject-object, spiritual-sensual, etc. contrasts, and which starts with sensual observation but a moment later “leaves the senses” for the sake of meaning and word that *in the silence clearer grow*. It is in this single and indivisible act of cognition that the sense of the word can reveal itself and exist in the full meaning of the word.

The rest is... computation.

#### Endnotes

- <sup>1</sup> After: P.J. Davis, R. Hersh, *Ograniczenia matematyki*, transl. J. Skolimowski, in: *Skarby matematyki*, ed. T. Ferris, Warszawa 1998, p. 140.
- <sup>2</sup> From the name of the Dutch mathematician Ludolph van Ceulen (1539-1610).
- <sup>3</sup> Cf. I. Ekeland, *Chaos*, transl. M. Jarosiewicz, Katowice 1999, p. 27; A.D. Aczel, *Wielkie twierdzenie Fermata*, transl. P. Strzelecki, Warszawa 1998. It is worth noting upon this occasion the archaic nature of interest in the numerical value of  $\pi$ : *Pi was known to within various*

*approximations to the Babylonians and Egyptians of the second millennium B.C. Interest in this number is connected naturally with the invention of the wheel. They took it as roughly three, and it arose naturally as a consequence of the discovery of the wheel. Pi also arose in various measurements of a pyramid. Pi is even alluded to in the Old Testament – in Kings I, 7-23 we read about a circular wall being constructed. From the given number of units for the circumference and the diameter, we can conclude that the ancient Israelites took it to be roughly three, Aczel, op. cit., p. 30.*

- <sup>4</sup> Aczel, op. cit., p. 29.
- <sup>5</sup> D. Reaney, *Śmierć wieczności. Przyszłość ludzkiego umysłu*, transl. W. Szelenberger, M. Szwed-Szelenberger, Warszawa 1993, p. 209 and 226.
- <sup>6</sup> S. Stein, *Potęga liczb*, Warszawa 1997, p. 208.
- <sup>7</sup> R. Barthes, *Mitologie*, transl. A. Dziadek, introd. K. Klośński, Warszawa 2000, pp. 123-125.
- <sup>8</sup> J. Berardinelli, *Darren Aronofsky's Piece of the  $\pi$* .
- <sup>9</sup> P. Coveney, R. Highfield, *Granice złożoności. Poszukiwania porządku w chaotycznym świecie*, transl. P. Amsterdamski, Warszawa 1997, p. 40.
- <sup>10</sup> A. Kaufman, *An Interview with Darren Aronofsky and Sean Gullette of "Pi"*.
- <sup>11</sup> B. Hrabal, *Mój wiek*, transl. A. S. Jagodziński, Warszawa 1994, pp. 35-36, 39.
- <sup>12</sup> M. Heidegger, *Czas światobrazu*, transl. K. Wolicki, in: *Drogi lasu*, transl. various authors, Warszawa 1997, p. 75.
- <sup>13</sup> K. Maurin, *Mistyka – matematyka – magia*, “Gnosis” no. 11:1999, p. 110.
- <sup>14</sup> Aronofsky himself drew attention to this rather obvious possibility, see: A. Kaufman, *An Interview...*
- <sup>15</sup> W. Hilsbecher, *Tragizm, absurd i paradoks*, selection and introduction S. Lichański, transl. S. Blaut, Warszawa 1972, pp. 110-111.
- <sup>16</sup> Hilsbecher, *op. cit.*, pp. 113-114.
- <sup>17</sup> *Ibid.*, pp. 113-114.
- <sup>18</sup> *Ibid.*, pp. 123-124.
- <sup>19</sup> *Ibid.*, p. 126.
- <sup>20</sup> On Biblical codes see the worthless and sensational: M. Drosnin, *Kod Biblii*, transl. J. Jannasz, Warszawa 1998 and the clearheaded and extraordinarily competent: J. Satinover, *Kod Biblii. Ukryta prawda*, transl. D. Konieczka, Bydgoszcz 1999.
- <sup>21</sup> L. Kołakowski, *Horror metaphysicus*, transl. M. Panufnik, Warszawa 1990, pp. 143-144.
- <sup>22</sup> Apparently, impatience is not the domain only of brilliant mathematicians but also of film critics. An interview with D. Aronofsky poses a ridiculous question: *What is the meaning of the end?*; it is difficult to tell whether it contains an unusual dose of ordinary inanity or boundless naiveté. Fortunately, the director did not fail: *One can comprehend the end of the film in many ways and I wanted people to propose various interpretations. Even I, Sean Gullette and Eric Watson wondered what it really signified, Wprawciw widza w trans. Z Darrenem Aronofskym rozmawia Anna Draniewicz*, “Kino” no. 5:2001, p. 22.
- <sup>23</sup> R.M. Rilke, *Poezje*, selection, transl. and foreword M. Jastrun, Kraków 1987, p. 35.