Peter Plichta

Order in Chaos: The Prime Numbers

Dr. Peter Plichta (b.1939), studied chemistry in Cologne, thereafter nuclear chemistry and law. His dissertation was on Silan compounds. In 1977 he had also finished a study of pharmacology and founded a pharmacy. Another time of study followed: physics and mathematics. His books are becoming bestsellers.

Plichta, P.: **Order in chaos: The prime numbers.**
Knowl.Org. 22(1995)No.3/4, p.129-135, 5 refs
Explanation of how prime numbers can be derived from the numbers 1, 2 and 3 and how they can be visualized on eight rays by introducing a cyclic way of presentation according to the model of an atom and its shells for the prime numbers of the form 6n+1. Also it is shown how prime numbers are coded in the Pascal Triangle. From its implications it is concluded that prime numbers form the background of the material world and that four-dimensional space around a point is a decimal prime-number space. (KO)

1. The chemist and the courage to decide

On February 10th, 1939, the editors of the magazine “Die Naturwissenschaften” published an article dated December 22nd, 1938 written by the two chemists Otto Hahn and Fritz Strassmann. The abstract begins with the statement that: “1. The emergence of barium isotopes from uranium has been proved conclusively”. Otto Hahn, the founder of nuclear chemistry in Germany, had made a decision which turned the whole physical concept of the world on its head. The atom - the indivisible - had been split. Irène Curie - who had the chance to be awarded a second Nobel prize, as her mother had - had not dared boldly publish the unspeakable. Ever since the father of modern chemistry, Antoine de Lavoisier, had described the chemical elements as indivisible entities, this characteristic of atoms had been accepted as dogma. Now Otto Hahn was declaring a dogma of natural science to be false, as indeed many courageous fellow scientists before him had. Seven years later his discovery led to the explosion of the first three atom bombs.

In the course of my early involvement in chemistry and physics I soon became fascinated by the notion that atomic nuclei and shells are subject to pure laws of numbers. These laws of numbers are of such elegant simplicity and clear beauty that, by contrast, the formulae of quantum mechanics look like an expression of human confusion, even though their magnificence is being hailed by all the experts. In 1970 one single German nuclear chemist received from NASA in the United States a thimble of black sand from the moon: Professor Herr, a pupil of Otto Hahn. This man had tested me in the examinations for my doctor’s degree, and, on his return from America, telephoned me in my laboratory. At that time I was busy with my inaugural dissertation for the position of university lecturer, working in the area of silicon hydrides and was the first chemist who managed to produce silicon-benzene compounds from these. While I gazed in fascination at this moon dust and instinctively wet my finger and took a little sand from the moon into my mouth - and proceeded to swallow it much to the amazement of the professor - I remembered that it was this pupil of Otto Hahn who had encouraged my doubts regarding the existing world order of physics. At that time I could not have known, that a quarter of a century later I would join battle in a decisive struggle which was raging between chaos physics and mathematics. Once again a dogma would be unmasked as a human delusion.

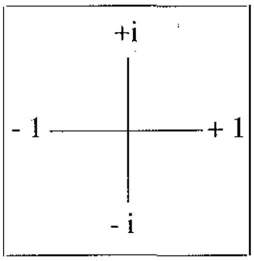
Throughout the last century, most mathematicians - apart from some atheists and agnostics, perhaps - believed the world to be designed, in a biblical sense, according to dimensions, numbers and weight. Later positivism emerged and denied any real existence for numbers. If numbers are only a fiction created by the human mind, then all geometries must also be fictions, just as, for instance, the beauty of a game of chess can be perceived both visually and logically. Some people consider it mere coincidence that a flower will always have a special shape and a certain number of leaves. As this world could not have been created by God, a theory had to be created, which physicists call the “Big Bang”. Because all very distant objects are constantly moving away from us at ever-increasing speeds - at least that is how the optical signals are “interpreted” - it can be inferred that originally all matter must have existed compressed to the size of a football. The snag with this theory is obvious: Where does this strange ball come from? As the answer to this question allows a god to be assumed, even the Pope has embarrassingly declared himself prepared to accept the big-bang theory. Just as mathematicians continue to cultivate the entirely redundant dogma that numbers and geometry have no a priori existence, the Catholic Church also has its share of foolish dogmas.

One new branch of physics, referred to as chaos theory, has for the past ten years been creating a new way of looking at the world, which led the “Spiegel” author Peter Brügge to publish a three-part series entitled “Myths from the computer / cult around chaos”. Unaware of the danger, Brügge stirred up quite a hornet’s nest with this publication. One of the leading researchers in chaos theory, the professor of mathematics Heinz-Otto Peitgen from Bremen, and his co-authors are currently enjoying great success in the US and in Germany with their two-volume work "Fractals for the Classroom"[1] (1). The crux of the matter already becomes clear from the blurb on the jacket of these quite skillful books, with such statements as "fractal geometry is the geometry of chaos" and "how mathematicians manage to find elements of order in chaos". Mathematics has been busy upholding the dogma for hundreds of years that geometry has no real existence, and it is mathematicians, above all people, who are now trying to promulgate that a geometry does indeed exist in the chaotic nature of physical processes. Although Peitgen does not explicitly state that the fractals of the Sierpinski Triangle (which will later be elaborated) are real existing geometry in the thermodynamic sense, he does explain to the reader that pattern composition has something to do with prime numbers. If Peitgen or some other author establishes that the background of this world is hidden in the trinity of infinite phenomena – space, time and numbers – the same situation could arise as in the aforementioned year 1939. One important piece of information is contained in numbers: the distribution of the prime numbers. Now that Dr. Felten and I have solved the prime-number puzzle (2), a total breakdown in our concept of the physical world is inevitable. Irrespective of the strength of the resistance and the amount of silence, the history of science has shown that elegance of thought has always prevailed in the end.

2. Four-dimensional (Euclidean) and three-dimensional (fractal) geometry

There are three essential aspects form the basis of number theory:

1. According to Euler and Gauss the number **one** has a cross structure (unit disc) ± 1, or ± i.



From this are derived all prime numbers of the type 6n ± 1 – that is the numbers 5; 7 and 11; 13 and 17; 19 and 23; 25, etc., although with the number 25 the first product of two previous prime numbers occurs because of combinations.

2. The number **two** is the only even prime number. From it the numbers divisible by two are derived: 4; 8; 10; 14; 16 ....

3. The number **three** is the only uneven prime number which is not of the form 6n ± 1. From it all numbers divisible by three are derived: 6; 9; 12; 15; 18 ....

Fig. 1 shows the first two shells of such a cyclic mathematical concept, which has terminated the former epoch of linear thinking. The black point in the centre - nicely visualized for students - shows the connection between the minuscule atomic nucleus and the giant atomic shell. Fig. 1 has the disadvantage that position -1 is also occupied by 23. This caused me to set a null shell under the shell with the first twenty-four numbers obeying the natural rhythm of the prime-number twins. This null shell consists only of mirror-images of the number one. As the number +1 is the product of (-1) · (-1), the squaring operation must consequently be carried out once more in order to obtain the circle of the first twenty-four numbers.

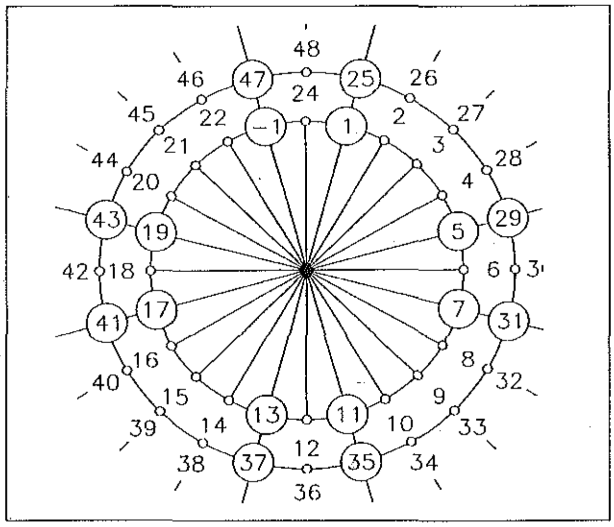


Fig. 1: The first two shells of a cyclic mathematical concept

The products $1 \cdot (-1)^4$, $2 \cdot (-1)^4$, $3 \cdot (-1)^4$, $4 \cdot (-1)^4$ ... revolve on the first shell.

The geometry of such a numeric space is determined by the three base numbers one, two and three, from which all other numbers derive, and from the eight-rays of the prime numbers of the form 6n ± 1. Fig. 2 shows only the prime numbers, while the product of all prime numbers below a given number make up the grid. Just as the number circles in fig. 2 are generated by a continuing quadrature of -1, other number circles can also be generated in accordance with the rectangular geometry of the Euler number cross, vertical to the symbol plane, by a continuing quadrature of -i ($-i^2 = +1$). There is no z-axis in the Euler cross. In this way a spatial structure is formed of the type: area squared. This is the infinite four-dimensional numeric space around the Euler cross.

What is simple to grasp for schoolchildren and dreadfully difficult to comprehend for graduated mathematicians is the fact that the numbers two and three no longer belong to those prime numbers which are only divisible by the number one. They are rather numbers which are the first members of a separate series and for this reason they must, of course, be prime numbers. So far only the infinite space around a point of finite size has been described as numeric space, whose essence comprises the ordered series of the integers. However, we would now like to examine the structure of finite three-dimensional space. Such a space – a shoe-box full of air – is ordered just in the same way as four-dimensional space, based on the series of the reciprocal numbers 1; 1/2; 1/3; 1/4, etc. It is well known that all integers of whatever size fit reciprocally into the finite interval between the numbers zero and one. In Volume II of "The prime number cross" (2), which reflects the state of knowledge up to 1991, I demonstrated that the physics of the collision processes of gases (thermodynamics) can finally be reduced to the order of a Pascal Triangle.

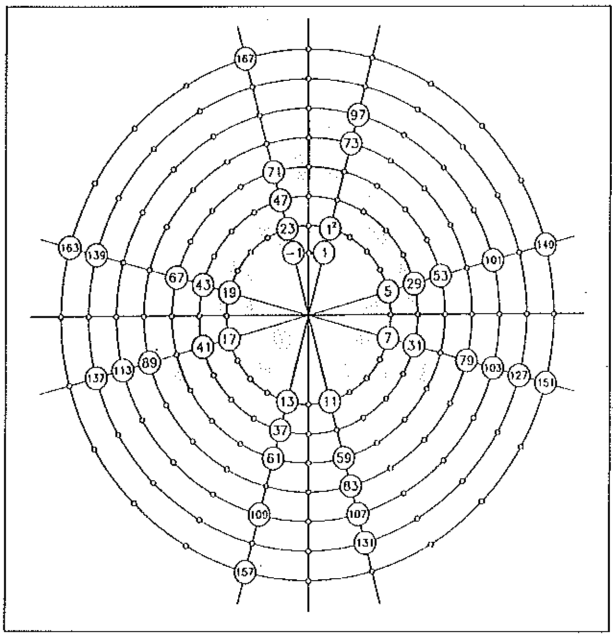


Fig. 2: The prime numbers in circles generated by a continuing quadrature of -1.

To help us to examine the statistics of a two-body collision we can consider the path of a single ball falling through a board of nails. The ball should fall from the zero level and has only one possibility of direction of fall. If it falls onto the first nail, it can be deflected to the right or to the left. Let us consider the probability that it falls to the right. This measures 1/2. On falling to the second level the ball again has the choice to fall to the right or to the left.

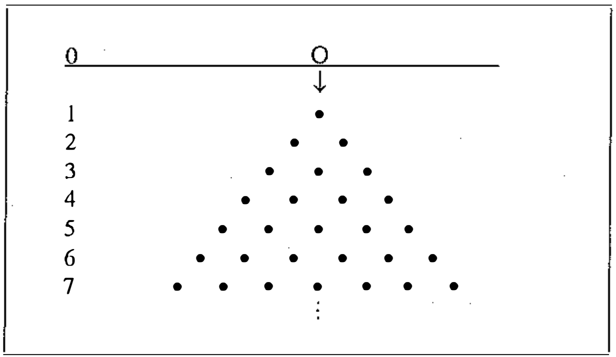


Fig. 3: Probability of a ball falling through a board of nails

The probability that the ball again falls to the right is computed $1/2 \cdot 1/2$. On the third level, the value for the option to fall to the right is now $1/2 \cdot 1/2 \cdot 1/2$ etc. We then add each separate rate of probability for the continued infinite fall to the right and obtain

$$1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\ldots=2$$

The ball has always only two possible options when falling. Because of the zero level, where there is only one option, the sum of the options for falling to the right must give the value two. The relevant power series runs:

$$2^0+2^{-1}+2^{-2}+2^{-3}+\ldots=2$$

Instead of examining the separate options for a continued path to the right, we would now like to consider the descent of the ball when there is a free choice. The descent of the ball from the zero level through the first level is the same as in the above example. In the second level there is one way leading to the left nail and one way to the right nail. To the middle nail in the third level there are then exactly two ways. Each of the two middle nails in the fourth level can be reached by three ways. In the next level there are combinations of 1, 4, 6, 4, 1 ways to reach each nail. In general, we obtain the following pattern - the triangle that has taken its name from the French mathematician and philosopher Blaise Pascal:

1	→	$1=2^0$
1 1	→	$2=2^1$
1 2 1	→	$4=2^2$
1 3 3 1	→	$8=2^3$
1 4 6 4 1	→	$16=2^4$
1 5 10 10 5 1	→	$32=2^5$
1 6 15 20 15 6 1	→	$64=2^6$
1 7 21 35 35 21 7 1	→	$128=2^7$
1 8 28 56 70 56 28 8 1	→	$256=2^8$
⋮		

The sum of the possibilities of paths for each level in the triangle is a power of two. With a falling ball, one possibility is chosen at each level from the sum of all combinations, i.e. from

$$\frac{1}{2^n}$$

The addition of all reciprocal powers of two thus produces a basic constant - the number 2. The infinite series 1 + 1/2 + 1/3 + 1/4 + 1/8, etc. was studied by Leibniz. However, the sum of the series, the number two, never gave rise to the assumption that the number 2 could be a natural constant. Before I discuss this further, it should be explained to the reader how the individual numbers in the Pascal Triangle are calculated. These seemingly mysterious numbers are calculated from binomials of the type $(a+b)^n$.

$(a+b)^0 = 1$
$(a+b)^1 = 1a + 1b$
$(a+b)^2 = 1a^2 + 2ab + 1b^2$
$(a+b)^3 = 1a^3 + 3a^2b + 3b^2a + 1b^3$
$(a+b)^4 = 1a^4 + 4a^3b + 6a^2b^2 + 4b^3a + 1b^4$

This pattern was, incidentally, only rediscovered by Pascal. It had originally come to Europe with the Moors. The coefficients of expressions of the letters a and b are called binomial coefficients. The special thing about them is that it is not necessary to multiply them out according to the above complicated process - they are simply the result of addition. The two ones in the second line are added to give the two in the next line below. And the one and two of the third line add to give the three of the fourth line. The sum of the two threes in the fourth line provides the number six in the fifth line. This puzzling order becomes even more mysterious when it is discovered in the seventh line

1, 7, 21, 35, 35, 21, 7, 1

whose second coefficient begins with the prime number 7, that all further coefficients are divisible by the prime number 7. This rule has general application: always when the exponent of the binomial is a prime number, all coefficients - apart from the number one - are divisible by a prime number. No explanation need be considered here, an example will suffice to demonstrate the depth of the secrets hidden in number theory and the brilliance of its champions.

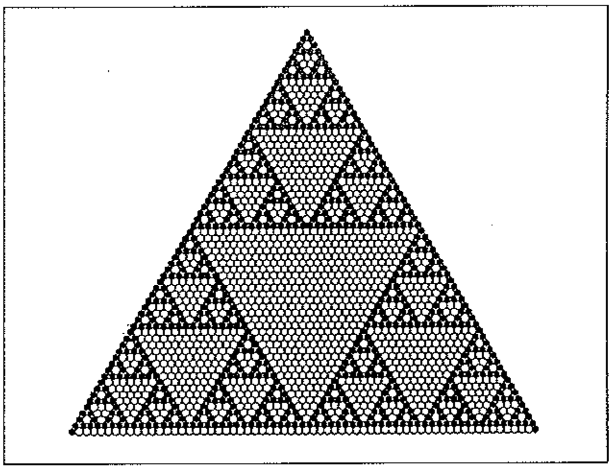


Fig. 4: Pascal Triangle coded in prime numbers called Sierpinski Triangle

Some of the most important mathematical operations – such as the decimal fraction and the binomial - as well as decisive chemical experiments – such as the distilling method – were copied by the Christian Occident from the Arabs. Some of this debt received recognition by the historians of science in the exultation over modern discoveries. Others, like the coding of prime numbers in the Pascal Triangle, are still totally unknown to the same historians.

Why is the Pascal Triangle coded in prime numbers and which implications does this feature entail? Let us take a large 65-line Pascal Triangle, called the Sierpinski Triangle, as in Figure 4. In this curious geometric object, the image does not show the figures for the binomial coefficients themselves, but rather illustrates the divisibility of the coefficients by the number two using the colours white and black. Fractal is the name for this even-uneven geometry and the first eight lines produce a triangle which can be better described when enlarged.

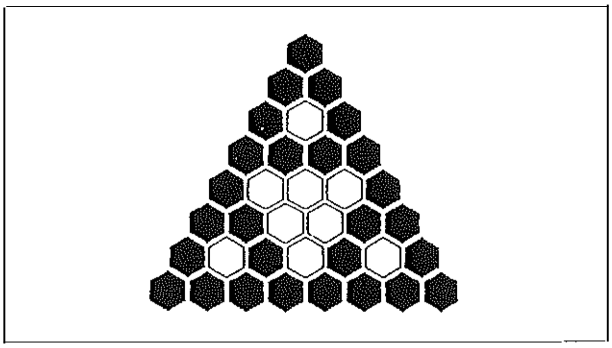


Fig. 5: One section of the Pascal Triangle with an even - uneven geometry, a fractal

The third line shows a white hexagon, because the binomial coefficient two is an even prime number. As the prime number three is uneven, the fourth line establishes the geometry of the entire eight-line triangle - Figure 5 can be viewed equally from three sides, and it thus becomes clear that it consists of three triangles (because of divisibility by two) and contains in the middle a fourth white triangle standing on its head. From the first four lines of the Pascal Triangle

1
1 1
1 2 1
1 3 3 1

the following situation can be obtained: The two ones when added give the even prime number 2. Because of the two ones, the following lines can only include the numbers 1, 2 and 3. It is therefore ensured that in the sixth line, where the number 5 appears for the first time, the number 10 will occur twice as in a palindrome. As ten is divisible by the prime number 5, because of the numbers 1, 2 and 3 the eighth line is coded from this moment on by the prime number 7. The first eight-sided triangle doubles itself to the sixteenth line; and at the same time the size of the inverted white triangle in the centre also increases. Fractal geometry must therefore retain its prime-number code. As the number 1 has so far not been considered a base number of all prime numbers of the type $6n \pm 1$, and the numbers 2 and 3 are not of the type $6n \pm 1$, mathematicians were not able to recognize the connection between prime numbers and the fractal geometry of the Pascal Triangle. I myself did not get to the bottom of the problem until spring of this year when I realized that the inverse of a four-dimensional geometry deriving from the base numbers 1, 2 and 3 and which has eight rays must produce a geometry which is constructed in a triangle on the numbers 1, 2 and 3 and which has eight lines.

It is well known that the inversion of the integers produces the reciprocal numbers and in "Das Primzahlkreuz", (2, v.2, p. 153) I demonstrated at length that the coefficient series for falling balls on a nail-board have to be demonstrated mathematically by reciprocal numbers, as the importance for the subsequent location of the ball decreases from level to level. The distribution of balls falling through a nail-board is defined by the formula e^{-x^2}. If a sack of peas is simply emptied out, they will be distributed according to the same pattern as with a nail-board. The pile is highest in the centre, declines very steeply, and there are many single peas spread around the edges. Scientists studying thermodynamics have, when describing collision processes involving gas molecules, made use of a form of mathematics which was completed over a hundred years ago. They did not consider that one mol of a gas with its 10^{23} molecules represents a grid area in which the colliding molecules themselves are the grid. As the fundamental constant of the universe e = 2,718... itself is the order of the integers in four-dimensional prime-number space, the inverse of e, the natural logarithms, must also somehow relate to reciprocal numbers. Since the natural logarithms bring the decrease of prime numbers ad infinitum (Prime Number Theorem, 1896), the reverse is also true that the reciprocal prime numbers and the yes-no decisions in collisions are linked with a geometry which appears foreign to us and which we call fractal geometry. The decision has to be made at this point: This geometry has a real existence in nature and is the reason why the entropy of a gas is strictly linked to the natural logarithm system. The fractal geometry of the Pascal Triangle also gives an explanation why a musical note, when it emerges from the strings of an instrument through the medium of gas, can be carried at all and precisely so in the confusion of colliding gas atoms (yes-no decisions). The division of the string into halves, thirds or quarters (fifth and fourth cycle) is transferred to the gas medium with its reciprocal numeric order in a fractal manner and then after eight steps the octave is completed. The human ear is also built in the manner required by fractal geometry for the transport of information through air. It should be pointed out once again that physically there must be two spaces. The four-dimensional space around a point transports electromagnetic waves according to the order of integers. Each body in this room is three-dimensional. When such a three-dimensional body is filled with air it conducts sound or heat according to the order of reciprocal numbers. Both spaces are entirely inversions, as for each integer its infinite inverse also exists. (The inverse of all integers is always infinite, e.g. the inverse of 5 is 0. 19999... or 0.20000... which is often overlooked by mathematicians.) The spaces are based on the base numbers 1, 2 and 3 and on the structure number 8.

3. The conflict between mathematicians and the advocates of chaos theory

Dieter Straub, head of the faculty of Thermodynamics at the Munich army college (Universität der Bundeswehr) München, very critically and very courageously took the excesses of chaos theory to task in his book: A History of the Glass Bead Game. Irreversibility in physics: Irritations and implications, 1990 (3). In the Chapter "Chaotic World?" at the end of his book he discusses his work with mathematicians of the Institute for Applied Mathematics at the University of Karlsruhe, which eventually led to the three-part "Spiegel" series which I mentioned earlier. "Spiegel" looked at the work of Mr. Peitgen critically but favourably. Quite a different tone was heard in Düsseldorf in the article by Klaus Steffen "Chaos, fractal and the public image of mathematics" (4). The people there have long been aware that with Peitgen, Mandelbrot and other chaos theoreticians mathematics is being infiltrated via the back door by a new (fractal) geometry which is apparently anchored in nature. However, numbers and geometries were dogmatized once and for all as purely human inventions one hundred years ago. Peitgen points out with abundant clarity that the symmetry of the Sierpinski Triangle is not vaguely connected to prime numbers but is number theory pure and simple.

> *"The fractal patterns in a Pascal Triangle are, as it were, equivalent to the number-theoretical characteristics of binomial coefficients, and a better understanding of fractal characteristics will lead to a comprehensive understanding of their number-theoretical characteristics."*

What Peitgen could not know is the great progress in number theory made over the past year in the course of my research in prime numbers. While Peitgen in his second volume derived a sentence from Kummer which says something about the divisibility of binomial coefficients by prime numbers or prime-number powers, he had probably not considered that it was precisely this E.E. Kummer who had shown the connection between the numerators in Bernoulli numbers and Fermat's Last Theorem. Bernoulli numbers play a central part in higher mathematics and it is important to know that they are computed from the binomial coefficients. Because I had declared in "Das Primzahlkreuz", Volume II that the denominators of Bernoulli numbers are to be categorized as prime-number coded, I was correspondingly confronted with the question of why all the denominators of Bernoulli numbers are divisible by six and thus connect with the fact that all prime numbers – apart from the numbers 2 and 3 - are of the type 6n ± 1. As the product of the numbers $1 \cdot 2 \cdot 3 = 6$ and also the sum $1 + 2 + 3 = 6$, the most important theorems of mathematics can be deduced from these three numbers – those relating to the question why the theorems exist at all. The method used so far in mathematics has been the formulation of suppositions; the proof then followed – or sometimes didn't.

On July 1st 1993 I gave a lecture at the Institute for Applied Mathematics at the University of Karlsruhe. At the end I indicated that it must be possible to develop a theorem from the prime-number coded denominators of the Bernoulli numbers in which numbers of the type 6n ± 1 minus one must occur in powers. Such a theorem would have to provide a declaration as to whether the power is a prime number. As such a theorem has already been made and is referred to as Fermat's Minor Theorem, I was encouraged by Edgar Kaucher to tackle this problem. One month later, Felten, Kaucher and I knew why Fermat's Minor Theorem makes propositions about prime numbers and quasi-prime numbers. The entire field of higher mathematics in its immense complexity is beginning to dissolve into a costume of the integers and reciprocal prime numbers. The physical concept of the world - which is atheistic-materialistic - will break down as completely as Communism did. This was beautifully illustrated in Peitgen's book (1, Chapt.6) "The chaos game: How chance generates deterministic forms". Peitgen introduces this chapter with a quotation from Spinoza: "Nothing in nature is by chance ... something appears to us to be chance only because of the incompleteness of our knowledge." In order to somewhat reduce this incompleteness of our knowledge, I would like to briefly describe Peitgen's chaos game. The interested reader can look up the drawings in Peitgen's book (1,p.354 - 356). There he will find an equilateral triangle whose corners are marked with the numbers 1, 2 and 3. We are to imagine the tiniest of balls (e.g. a gas atom). A random generator, which can only produce the numbers 1, 2 and 3, displays the first number and a line can be drawn connecting the ball and the corresponding corner of the triangle. Half way along the line it is stopped and another random number is generated; another connecting line is drawn and again stopped half way. A short time later the ball is within the triangle and cannot leave it as long as we continue the process. The ball now executes random zigzag movements in all directions. The purpose here is not to draw the connecting lines, rather only to mark with a point the various new locations of the ball. What is going on here is directly related to the kinetics of colliding gas atoms and in this there are, in principle, only two-body collision and thus yes-now decisions. After approximately five hundred collisions, the points begin to form a structure. After a few thousand markings, a Sierpinski Triangle begins to emerge with increasing clarity which will ideally have the shape of that in Fig. 4.

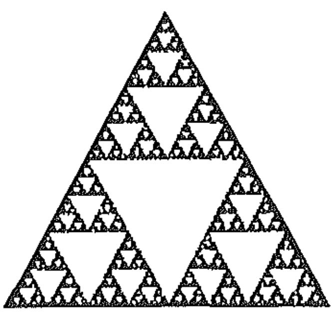


Fig. 6: A random process generation of a Sierpinski Triangle

Peitgen writes:
"When Figure 6.3 emerges for the first time, you can hardly believe your eyes. We have just observed the generation of a Sierpinski Triangle by a random process. This is all the more astounding as the Sierpinski Triangle has always been for us a perfect example of structure and order. With other words, we have witnessed how chance can generate an absolutely deterministic form."

He then considers the question why fractal patterns can be created with the numbers 1, 2 and 3 and he uses in his examination the decimal system in the form of a meter measuring stick, divided into decimetres, centimetres and millimetres in which, for example, three figures 1, 2 and 3 written in decimal mean 123 (one hundred and twenty three). Without any knowledge of the special features of the prime numbers 2 and 3, he uses a place value system to reach a somewhat roundabout but correct solution to the question why black areas have to appear in some places and fractal white patterns in others. What he cannot know is *that he discovered the true order of three-dimensional space filled with matter*! Thermodynamics is a subject of physical chemistry. However, mathematicians generally have not got an inkling about chemistry, and chemists, likewise, have no notion of number theory (the Queen of Sciences, according to Gauss.

It is not only the loss of face which mathematicians and physicists have to fear when they recognize that prime numbers make up the background to the material world. The academic world has to sustain a further shock with the decimal system. Even if a theory (Quantum mechanics, particle physics, cosmological aspects of astrophysics) is showered with a hundred Nobel prizes, there can be no certainty as regards the truth of this theory. As I have furnished flawless mathematical proof that four-dimensional space around a point is a **decimal** prime-number space, the reciprocal number space must obviously also have a decimal structure. After Felten and I had been working on this problem for five years, two helpers suddenly came to our assistance and greatly furthered progress in the matter. One was the engineer and whiz-kid with numbers, Hans Jeckel, the other was the calculating genius Rüdiger Gramm, who was seen live by 16 million viewers of the TV show "Wetten, daß...". When I let him examine the Pascal Triangle

$$\begin{array}{ccccccccccc} &&&&1&&&& \rightarrow & 1 & = 11^0 \\ &&&1&&1&&& \rightarrow & 11 & = 11^1 \\ &&1&&2&&1&& \rightarrow & 121 & = 11^2 \\ &1&&3&&3&&1& \rightarrow & 1331 & = 11^3 \\ 1&&4&&6&&4&&1 \; \rightarrow & 14641 & = 11^4 \\ &&&&\vdots&&&&&& \end{array}$$

he did not read the coefficients as individual numbers but registered them at a glance as powers of the number eleven. In the sixth line

1 5 10 10 5 1

this power series of the number eleven is not interrupted, since decimal shifts are undertaken with the number ten and the following decimal number is produced:

$$1\ 6\ 1\ 0\ 5\ 1 = 11^5$$

This operation can be repeated any number of times. The suspicion then arises for the first time that the Pascal Triangle, and thus also the Sicrpinski Triangle, arc coded in the decimal system in such a way that nobody notices. At scarcely any time in history has a matter been so demonised as the question of the decimal system in this century. The elite among the mathematicians of this world would put all **ten** fingers of their hands into the fire for the belief that the decimal system is nothing more than a chance (and very practical) system. I shall discuss this question in more detail later and only wish to indicate here how happy Rüdiger Gramm's reaction made me. It can no longer be denied that the Pascal Triangle is coded from top to bottom by the number eight and from left to right by the number eleven. I now know at last just why the isotope distribution of the chemical elements is based precisely on these numbers. We have thus once more linked up with nuclear chemistry. I was the first to be able to answer the question why there were only $81 = 3^4$ stable elements in the universe and why the two elements with the numbers 43 and 61 are missing (they can only be produced in laboratories and have no stable isotopes). The question why in exploding stars the stable elements tend to fan out into ten sorts of isotopes is so far still unanswered. Under high pressures (unimaginable temperatures) protons and electrons fuse into neutrons. These collision processes produce an isotope distribution according to the pattern $4 \cdot 19$. The reason why the number 19 is split four times in the ratio 8 to 11 (2, vol. 1, p.432)" is because of the decimal fractal structure of collision processes.

The sorry state of modern physics was disclosed to me recently by one of its most prominent champions, when he said: "Dear Mr. Plichta, The isotope has nothing to do with prime numbers. You should imagine the neutrons, which occur in increased numbers in heavy nuclei, as a kind of paste or glue. Without the superfluous neutrons the nuclei would fall apart." I would like to emphasize at this point that only a "divine" order prevails in atomic nuclei and neither chance nor 'glue'. What certainly will fall apart are houses which are built of cards called pride.

References

(1) Peitgen, H.-O.: Fractals for the classroom. New York: Springer 1992

(2) Plichta, P.: Das Primzahlkreuz. Vol.1: Im Labyrinth des Endlichen. Vol.2: Das Unendliche. Düsseldorf: Quadropol Verl. 1991. 469+206p.

(3) Straub, D.: Eine Geschichte des Glasperlenspiels. Irreversibilität in der Physik: Irritationen und Folgen. Basel: Birkhäuser Verlag 1990.

(4) Steffen, K.: Chaos, Fraktale und das Bild der Mathematik in der Öffentlichkeit. DMV Mitt. (1994)No.1.

(5) Plichta, P.: Gottes geheime Formel. Die Entschlüsselung des Welträtsels und der Primzahlencode. München: A.Langen/G.Müller Verlag 1995. 302p.