

How Much Shall We Bet?

by Italo Calvino

The logic of cybernetics, applied to the history of the universe, is in the process of demonstrating how the galaxies, the solar system, the Earth, cellular life could not help but be born. According to cybernetics, the universe is formed by a series of feedbacks, positive and negative, at first through the force of gravity that concentrates masses of hydrogen in the primitive cloud, then through nuclear force and centrifugal force which are balanced with the first. From the moment that the process is set in motion, it can only follow the logic of this chain.

Yes, but at the beginning nobody knew it, --*Qfwfq explained*,-- I mean, you could foretell it perhaps, but instinctively, by ear, guessing. I don't want to boast, but from the start I was willing to bet that there was going to be a universe, and I hit the nail on the head; on the question of its nature, too, I won plenty of bets, with old Dean (k)yK.

When we started betting there wasn't anything yet that might lead you to foresee anything, except for a few particles spinning around, some electrons scattered here and there at random, and protons all more or less on their own. I started feeling a bit strange, as if there was going to be a change of weather (in fact, it had grown slightly cold), and so I said: "You want to bet we're heading for atoms today?" And Dean (k)yK said: "Oh, cut it out. Atoms! Nothing of the sort, and I'll bet you anything you say."

So I said: "Would you even bet ix?"

The Dean answered: "Ix raised to en!"

He had no sooner finished saying this than around each proton its electron started whirling and buzzing. An enormous hydrogen cloud was condensing in space. "You see? Full of atoms!"

"Oh, if you call *that* stuff atoms!" (k)yK said; he had the bad habit of putting up an argument, instead of admitting he had lost a bet.

We were always betting, the Dean and I, because there was really nothing else to do, and also because the only proof I existed was that I bet with him, and the only proof he existed was that he bet with me. We bet on what events would or would not take place; the choice was virtually unlimited, because up till then absolutely nothing had happened. But since there wasn't even a way to imagine how an event might be, we designated it in a kind of code: Event A, Event B, Event C, and so on, just to distinguish one from the other. What I mean is: since there were no alphabets in existence then or any other series of accepted signs, first we bet on how a series of signs might be and then we matched these possible signs with various possible events, in order to identify with sufficient precision matters that we still didn't know a thing about.

We also didn't know what we were staking because there was nothing that could serve as a stake, and so we gambled on our word, keeping an account of the bets each had won, to be added up later. All these calculations were very difficult, since numbers didn't exist then, and we didn't even have the concept of number, to begin to count, because it wasn't possible to separate anything from anything else. This situation began to change when, in the protogalaxies, the protostars started condensing, and I quickly realized where it would all end, with that temperature rising all the time, and so I said:

"Now they're going to catch fire."

"Nuts!" the Dean said.

"Want to bet?" I said.

"Anything you like," he said, and wham the darkness was shattered by all these incandescent balls that began to swell out.

"Oh, but that isn't what catching fire means..." (k)yK began, quibbling about words in his usual way.

By that time I had developed a system of my own, to shut him up: "Oh, no? And what does it mean then, in your opinion?"

He kept quiet: lacking imagination as he did, when a word began to have one meaning, he couldn't conceive of its having any other. Dean (k)yK, if you had to spend much time with him, was a fairly boring sort, without any resources, he never had anything to tell. Not that I, on the other hand, could have told much, since events worth telling about had never happened, or at least so it appeared to us. The only thing was to frame hypotheses, or rather: hypothesize on the possibility of framing hypotheses. Now, when it came to framing hypotheses of hypotheses, I had much more imagination than the Dean, and this was both an advantage and a disadvantage, because it led me to make riskier bets, so that you might say our probabilities of winning were even.

As a rule, I bet on the possibility of a certain event's taking place, whereas the Dean almost always bet against it. He had a static sense of reality, old (k)yK, if I may express myself in these terms, since between static and dynamic at that time there wasn't the difference there is nowadays, or in any case you had to be very careful in grasping it, that difference.

For example, the stars began to swell, and I said: "How much?" I tried to lead our predictions into the field of numbers, where he would have less to argue about.

At that time there were only two numbers: the number e and the number π . The Dean did some figuring, by and large, and answered: "They'll grow to e raised to π ." Trying to act smart! Any fool could have told that much. But matters weren't so simple, as I had realized. "You want to bet they stop, at a certain point?"

"All right. When are they going to stop?"

And with my usual bravado, I came out with my π . He swallowed it. The Dean was dumbfounded.

From that moment on we began to bet on the basis of e and π .

" π !" the Dean shouted, in the midst of the darkness and the scattered flashes. But instead that was the time it was e . We did it all for fun, obviously; because there was nothing in it for us, as far as earning went. When the elements began to be formed, we started evaluating our bets in atoms of the rarer elements, and this is where I made a mistake. I had seen that the rarest of all was technetium, so I started betting technetium and winning, and hoarding: I built up a capital of technetium. I hadn't foreseen it was an unstable element that dissolved in radiations: suddenly I had to start all over again, from zero.

Naturally, I made some wrong bets, too, but then I got ahead again and I could allow myself a few risky prognostications.

"Now a bismuth isotope is going to come out!" I said hastily, watching the newborn elements crackle forth from the crucible of a "supernova" star. "Let's bet!"

Nothing of the sort: it was a polonium atom, in mint condition. In these cases (k)yK would snigger and chuckle as if his victories were something to be proud of, whereas he simply benefitted from overbold moves on my part. Conversely, the more I went ahead, the better I understood the mechanism, and in the face of every new phenomenon, after a few rather groping bets, I could calculate my previsions rationally. The order that made one galaxy move at precisely so many million light-years from another, no more and no less, became clear to me before he caught on. After a while it was all so easy I didn't enjoy it any more.

And so, from the data I had at my disposal, I tried mentally to deduce other data, and from them still others, until I succeeded in suggesting eventualities that had no apparent connection with what we were arguing about. And I just let them fall, casually, into our conversation.

For example, we were making predictions about the curve of the galactic spirals, and all of a sudden I came out with: "Now listen a minute, (k)yK, what do you think? Will the Assyrians invade Mesopotamia?"

He laughed, confused. "Meso- what? When?"

I calculated quickly and blurted a date, not in years and centuries of course, because then the units of measuring time weren't conceivable in lengths of that sort, and to indicate a precise date we had to rely on formulas so complicated it would have taken a whole blackboard to write them down.

"How can you tell?"

"Come on, (k)yK, are they going to invade or not? I say they do; you say no. All right? Don't take so long about it."

We were still in the boundless void, striped here and there by a streak or two of hydrogen around the vortexes of the first constellations. I admit it required very complicated deductions to foresee the Mesopotamian plains black with men and horses and arrows and trumpets, but, since I had nothing else to do, I could bring it off.

Instead, in such cases, the Dean always bet no, not because he believed the Assyrians wouldn't do it, but simply because he refused to think there would ever be Assyrians and Mesopotamia and the Earth and the human race.

These bets, obviously, were long-term affairs, more than the others; not like some cases, where the result was immediately known. "You see that Sun over there, the one being formed with an ellipsoid all around it? Quick before the planets are formed: how far will the orbits be from one another?"

The words were hardly out of my mouth when, in the space of eight or nine--what am I saying?--six or seven hundred million years, the planets started revolving each in its orbit, not a whit more narrow nor a whit wider.

I got much more satisfaction, however, from the bets we had to bear in mind for billions and billions of years, without forgetting what we had bet on, and remembering the shorter-term bets at the same time, and the number (the era of whole numbers had begun, and this complicated matters a bit) of bets each of us had won, the sum of the stakes (my advantage kept growing; the Dean was up to his ears in debt). And in addition to all this I had to dream up new bets, further and further ahead in the chain of my deductions.

"On February 8, 1926, at Santhia, in the Province of Vercelli--got that? At number 18 in Via Garibaldi--you follow me? Signorina Giuseppina Pensotti, aged twenty-two, leaves her home at quarter to six in the afternoon: does she turn right or left?"

"Mmmmm . . . " (k)yK said.

"Come on, quickly. I say she turns right . . . " And through the dust nebulae, furrowed by the orbits of the constellations, I could already see the wispy evening mist rise in the streets of Santhia, the faint light of a street lamp barely outlining the sidewalk in the snow, illuminating for a moment the slim shadow of Giuseppina Pensotti as she turned the corner past the Customs House and disappeared.

On the subject of what was to happen among the celestial bodies, I could stop making new bets and wait calmly to pocket my winnings from (k)yK as my predictions gradually came true. But my passion for gambling led me, from every possible event, to foresee the interminable series of events that followed, even down to the most marginal and aleatory ones. I began to combine predictions of the most immediately and easily calculated events with others that required extremely complicated operations. "Hurry, look at the way the planets are condensing: now tell me, which is the one where an atmosphere is going to be formed? Mercury? Venus? Earth? Mars? Come on: make up your mind! And while you're about it, calculate for me the index of demographic increase on the Indian subcontinent during the British raj. What are you puzzling over? Make it snappy!"

I had started along a narrow channel beyond which events were piling up with multiplied density; I had only to seize them by the handful and throw them in the face of my competitor, who had never guessed at their existence. Once I happened to drop, almost absently, the question: "Arsenal-Real Madrid, semifinals. Arsenal playing at home. Who wins?," and in a moment I realized that with what seemed a casual jumble of words I had hit on an infinite reserve of new combinations among the signs which compact, opaque, uniform reality would use to disguise its monotony, and I realized that perhaps the race toward the future, the race I had been the first to foresee and desire, tended only--through time and space--toward a crumbling into alternatives like this, until it would dissolve in a geometry of invisible triangles and ricochets like the course of a football among the white lines of a field as I tried to imagine them, drawn at the bottom of the luminous vortex of the planetary system, deciphering the numbers marked on the chests and backs of the players at night, unrecognizable in the distance.

By now I had plunged into this new area of possibility, gambling everything I had won before. Who could stop me? The Dean's customary bewildered incredulity only spurred me to greater risks. When I saw I was caught in a trap it was too late. I still had the satisfaction--a meager satisfaction, this time--of being the first to be aware of it: (k)yK seemed not to catch on to the fact that luck had now come over to his side, but I counted his bursts of laughter, once rare and now becoming more and more frequent...

"Qfwfq, have you noticed that Pharaoh Amenhotep IV had no male issue? I've won!"

"Qfwfq, look at Pompey! He lost out to Caesar after all! I told you so!"

And yet I had worked out my calculations to their conclusion, I hadn't overlooked a single component. Even if I were to go back to the beginning, I would bet the same way as before.

"Qfwfq, under the Emperor Justinian, it was the silkworm that was imported from China to Constantinople. Not gunpowder... Or am I getting things mixed up?"

"No, no, you win, you win . . . "

To be sure, I had let myself go, making predictions about fleeting, impalpable events, countless predictions, and now I couldn't draw back, I couldn't correct myself. Besides correct myself how? On the basis of what?

"You see, Balzac doesn't make Lucien de Rubempre commit suicide at the end of *Les Illusions perdues*," the Dean said, in a triumphant, squeaky little voice he had been developing of late. "He has him saved by Carlos Herrera, alias Vautrin. You know? The character who was also in *Pere Goirot*... Now then, Qfwfq, how far have we got?"

My advantage was dropping. I had saved my winnings, converted into hard Valletta, in a Swiss bank, but I had constantly to withdraw big sums to meet my losses. Not that I lost every time. I still won a bet now and then, even a big one, but the roles had been reversed; when I won I could no longer be sure it wasn't an accident or that, the next time, my calculations wouldn't again be proved to be wrong.

At the point we had reached, we needed reference libraries, subscriptions to specialized magazines, as well as a complex of electronic computers for our calculations: everything, as you know, was furnished us by a Research Foundation, to which, when we settled on this planet, we appealed for funds to finance our research. Naturally, our bets figure as an innocent game between the two of us and nobody suspects the huge sums involved in them. Officially we live on our modest salaries as researchers for the Electronic Predictions Center, with the added sum, for (k)yK, that goes with the position of Dean, which he has intrigued to obtain from the Department, though we kept on pretending he wasn't lifting a finger. (His predilection for stasis has got steadily worse; he turned up here in the guise of a paralytic, in a wheelchair.) This title of Dean, I might add, has nothing to do with seniority, otherwise I'd be just as much entitled to it as he is, though of course it doesn't mean anything to me.

So this is how we reached our present situation. Dean (k)yK, from the porch of his building, seated in the wheelchair, his legs covered with a rug of newspapers from all over the world, which arrive with the morning post, shouts so loud you can hear him all the way across the campus: "Qfwfq, the atomic treaty between Turkey and Japan wasn't signed today; they haven't even begun talks. You see? Qfwfq, that man in Termini Imerese who killed his wife was given three years, just as I said. Not life!"

And he waves the pages of the papers, black and white the way space was when the galaxies were being formed, and crammed--as space was then--with isolated corpuscles, surrounded by emptiness, containing no destination of meaning. And I think how beautiful it was then, through that void, to draw lines and parabolas, pick out the precise point, the intersection between space and time where the event would spring forth, undeniable in the prominence of its glow; whereas now events come flowing down without interruption, like cement being poured, one column next to the other, one within the other, separated by black and incongruous headlines, legible in many ways but intrinsically illegible, a doughy mass of events without form or direction, which surrounds, submerges, crushes all reasoning.

"You know something Qfwfq? The closing quotations on Wall Street are down 2 per cent, not 6! And that building constructed illegally on the Via Cassia is twelve stories high, not nine! Nearco IV wins at Longchamps by two lengths. What's our score now, Qfwfq?"

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