On the day everything changed, one of his molars was hurting so much he thought he'd go insane. In the night he had lain on his back, listening to the landlady snoring next door. At about six thirty in the morning, as he blinked wearily into the dawn light, he discovered the solution to one of the oldest problems in the world.

He went staggering through the room like a drunk. He must write it down immediately, he must not forget it. The drawer didn't want to open, suddenly the paper had hidden itself from him, his quill broke off and made blotches, and then the next thing to trip him up was the chamber pot. But after half an hour of scribbling there it all was on some crumpled piece of paper, the margins of a Greek textbook, and the tabletop. He laid his pen aside. He was breathing heavily. He realized that he was naked, and registered the dirt on the floor and the stink with surprise. He was freezing. His toothache was almost unbearable.

He read. Worked his way through it, followed the proof line by line, looked for errors, and didn't find any. He roamed over the last page and looked at his distorted, smeared, seventeen-sided figure. For more than two thousand years, people had been constructing regular triangles and pentangles with ruler
and compasses. To construct a square or to double the angles of a polygon was child's play. And if one combined a triangle and a pentangle, what one got was a fifteen-sided figure. More was impossible.

And now: seventeen. And he had a hunch there was a method that would allow him to go further. But he would have to find it.

He went to the barber, who tied his hands tight, promised it really wouldn't be bad, and with one quick movement pushed his pincers into his mouth. The very touch of them, a blinding flash of pain, almost made him faint. He tried to gather his thoughts, but then the pincers took hold, something went click in his head, and it was the taste of blood and the pounding in his ears that brought him back to the room and the man with the apron, who was saying it hadn't been so bad, had it?

On his way home he had to lean against walls, his knees were weak, his feet weren't under control, and he felt dizzy. In another few years there would be doctors for teeth, then it would be possible to cure this kind of pain and you wouldn't have to have every inflamed tooth pulled. Soon the world would no longer be full of the toothless. And everybody wouldn't have pockmarks, and nobody would lose their hair. He was amazed that nobody else ever thought about these things. People thought everything was naturally the way it was. Eyes glazed, he made his way to Zimmerman's rooms.

Entering without knocking, he laid the pieces of paper out in front of him on the dining table.

Oh, said the professor sympathetically, teeth, bad? He himself had been lucky, he'd only lost five. Professor Lichtenberg was left with a mere two, and Kästner had been toothless for years. With the tips of his fingers, because of a bloodstain, he picked up the first sheet. His brow furrowed. His lips moved.
It went on so long that Gauss could hardly believe it any more. Nobody could take that long to think!

This is a great moment, said Zimmerman finally.

Gauss asked for a glass of water.

He felt like praying. This must be printed, and it would be best if it appeared under the name of a professor. It wasn't the done thing for students to be publishing on their own.

Gauss tried to reply, but when Zimmerman brought him the glass of water, he could neither speak nor drink. He made a gesture of apology, wobbled home, lay down in bed, and thought about his mother up there in Brunswick. It had been a mistake to come to Göttingen. The university here was better, but he missed his mother, and even more so when he was ill. At about midnight, when his cheek had swollen still further and every movement in every part of his body hurt, he realized the barber had pulled the wrong tooth.

Luckily the streets were still empty in the early morning so nobody saw him stopping continually to lean his head against the house walls and sob. He would have given his soul to live a hundred years later when there would be medications for pain and doctors who deserved the name. Nor was it that hard. All that was necessary was to numb the nerves in the right spot, the best thing would be little doses of poison. Curare needed to be researched better! There was a flask of it in the Institute of Chemistry, he would go and have a look. But his thoughts slid away from him and he was only more aware of his own groaning.

It happens, said the barber cheerfully. Pain spread itself wide, but Nature was intelligent and man came with plenty of teeth. At the moment when he pulled the tooth, everything around Gauss went black.

As if the pain had wiped the event from his memory or
from time itself, he found himself hours or days later—how
could he tell—back in the chaos of his bed, with a half-empty
bottle of schnapps on the night table and at his feet the Universal
Advertiser and Literary Supplement, in which Privy Councilor
Zimmerman laid out the latest method for constructing a
regular seventeen-sided figure. And sitting beside the bed was
Bartels, who had come to congratulate him.

Gauss fingered his cheek. Oh, Bartels. He knew all about it.
He himself came out of poverty, had been considered a wunderkind, and believed himself chosen for great things. Then
he had met him, Gauss. And he knew, meanwhile, that for the
next two nights after they met, Bartels had lain awake and
thought about whether he should go back to the village, milk
cows, and muck out stalls. Sometime during the third night,
he had realized that there was only one way to save himself: he
would have to like Gauss. He would have to help him, no mat-
ter where it led. From that moment on, he had thrown all his
strength into working with Gauss, he had talked to Zimmer-
man, written letters to the duke, and one difficult evening, by
means of threats none of them wanted to remember, he had
got Gauss’s father to agree to let his son go to high school.
And the next summer he had gone with Gauss to visit his par-
ents in Brunswick. Suddenly the mother had taken him aside,
her face small with worry and shyness, to ask if there was any
future for her son at the university with all the educated peo-
ple. Bartels hadn’t understood. What she meant was, did Carl
have any future researching things? She was asking in confi-
dence, and promised not to repeat anything. As a mother, one
always had worries. Bartels had remained silent for a while,
before asking with a contempt which shamed him later if she
didn’t know that her son was the greatest scientist in the world.
She had wept and wept, and it had been extremely embarrassing. Gauss had never succeeded in forgiving Bartels.

He had come to a decision, said Gauss.

For what? Bartels looked up distractedly.

Gauss gave an impatient sigh. For mathematics. Until now he had wanted to concentrate on classical philology, and he still liked the idea of writing a commentary on Virgil, in particular Aeneas’ descent to the underworld. He felt that nobody yet had correctly understood this chapter. But there would still be time for that, after all he had only just turned nineteen. But above all he had realized that he could achieve more in mathematics. If one had to be born, even if nobody had bothered to ask, then one could at least try to accomplish something. For example, solving the question of what a number is. The foundation of arithmetic.

A life’s work, said Bartels.

Gauss nodded. With a little luck he’d be finished in five years.

But soon he realized it would go faster than that. Once he had begun, ideas came crowding in with a force he hadn’t experienced before. He barely slept, he stopped going to the university, ate the bare minimum, and rarely went to visit his mother. When he wandered through the streets murmuring to himself, he felt he had never been so awake. Without looking where he was going, he avoided bumping into people, he never stumbled, once he leapt to one side for no reason at all and wasn’t even surprised when a roof tile landed in the same second at his feet and shattered. **Numbers** didn’t seduce one away from reality, they brought reality closer, made it clearer and more meaningful in a way it had never been before.

**Numbers** were his constant companions now. He thought
of them even when he was visiting whores. There weren't that many in Göttingen, they all knew him, greeted him by name, and sometimes gave him a discount because he was young, good-looking, and well-mannered. The one he liked best was called Nina and came from a distant town in Siberia. She lived in the old lying-in house, was dark-haired, with big dimples in her cheeks and broad shoulders that smelled of the earth; when he was holding her tight, looking up at the ceiling as he felt her rocking on him, he promised he would marry her and learn her language. She laughed at him, and when he swore that he meant it, she answered that he was still very young.

The examination for his doctorate was supervised by Professor Pfaff. In response to his scribbled request, he was exempted from the oral exam, as it would have been quite risible. When he went to collect the document itself, he had to wait in the corridor. He ate a piece of dry cake and read the Göttingen Scholars’ Bulletin, which contained a report by a German diplomat about his brother's visit to New Andalusia. A white house on the edge of town, evenings cooling off in the river, women who came frequently to visit to have their lice counted. He turned the pages with a vague excitement. Naked Indians in the Chaymas mission, birds that lived in caves and used their voices to see, the way other creatures use eyesight. The great eclipse of the sun, then the departure for the Orinoco. The man's letter had taken eighteen months to arrive, and only God knows whether he was still alive. Gauss lowered the newspaper, Zimmerman and Pfaff were standing in front of him. They hadn't dared to disturb him.

That man, he said, impressive! But crazy too, as if truth was something you found out there and not here. Or as if you could run away from yourself.

Pfaff hesitantly handed him the document: passed, summa
cum laude. Of course. People were saying, said Zimmerman, that some great work was in progress. He was delighted that Gauss had found something that could occupy his interest and dispel his melancholy.

Yes, he was working on something of the kind, said Gauss, and when it was done, he would be going.

The two professors exchanged glances. Leaving the Electorate of Hannover? They did hope not.

No, said Gauss, please not to worry. He would be going far, but not out of the Electorate of Hannover.

The work advanced quickly. The law of quadratic reciprocity was worked out, and the riddle of the frequency of prime numbers came closer to a solution. He had completed the first three sections and was already into the main part. But again and again he laid his quill aside, propped his head in his hands, and wondered whether there was a proscription against what he was doing. Was he digging too deep? At the base of physics were rules, at the base of rules there were laws, at the base of laws there were numbers; if one looked at them intently, one could recognize relationships between them, repulsions or attractions. Some aspects of their construction seemed incomplete, occasionally hastily thought out, and more than once he thought he recognized roughly concealed mistakes—as if God had permitted Himself to be negligent and hoped nobody would notice.

Then the day came when he had no more money. As he was no longer a student, his stipendium had run out. The duke had never been pleased that he had gone to Göttingen, so there was no question of an extension.

He could get relief, said Zimmerman. By chance there was a job, a temporary one; they needed an industrious young man to help with land surveying.
Gauss shook his head.

It wouldn’t last long, said Zimmerman. And fresh air never hurt anybody.

Which was how he found himself unexpectedly stumbling through the countryside in the rain. The sky was low and dark, the earth was muddy. He climbed over a hedge and landed panting, sweating, and strewn with pine needles in front of two girls. Asked what he was doing here, he nervously expounded the technique of triangulation: if you knew one side and two angles of a triangle, you could work out the other sides and the unknown angle. So you picked a triangle somewhere out here on God’s good earth, measured the side that was most easily accessible, and then used this gadget to establish the angle of the third corner. He lifted the theodolite and turned it this way, and then this way, and do you see, like this, with awkward fingers, as if doing it for the first time. Then you fit together a whole series of these triangles. A Prussian scientist was in the process of doing exactly this among all the fabulous creatures in the New World.

But a landscape isn’t a flat surface, retorted the bigger of the two.

He stared at her. There had been no pause. As if she had needed no time to think it over. Certainly not, he said, smiling.

A triangle, she said, had one hundred and eighty degrees as the sum of its angles on a flat surface; but it was on a sphere, so this was no longer true. Everything would stand or fall based on that.

He looked her up and down as if seeing her for the first time. She returned his look with raised eyebrows. Yes, he said. So. In order to even things out, you had to scrunched the triangles, so to speak, after measuring them until they were infinitely small. In and of itself, a simple exercise in differentials.
Although in this form... He sat down on the ground and took out his pad. In this form, he murmured, as he began making notes, it's never been worked out in this form yet. When he looked up, he was alone.

For several weeks he went on crisscrossing the region with the geodetic implements, ramming stakes into the ground and measuring their relative distances. Once he rolled down a slope and dislocated his shoulder, more than once he fell into stinging nettles, and one afternoon when winter had almost arrived, a horde of children hurled dirty snowballs at him. When a sheepdog bounded out of a wood, bit into his calf almost gently, and vanished again like a ghost, he decided this must stop. He was ill-suited to such dangers.

But he saw Johanna quite often now. It seemed as if she had always been somewhere nearby, only hidden from him by camouflage or lapses in his attention span. She walked ahead of him in the street, and it was as if his wish that she stop was enough to make her slow her step. Or she sat in church three rows behind him looking tired but concentrated as the pastor laid out their future damnation if they failed to make Christ's suffering their own, his cares their cares, his blood their blood; Gauss had long since given up wondering what this was supposed to mean, and was quite aware of how sarcastically she would look at him if he turned around now.

Once they went for a walk outside the town with her silly, perpetually sniggering friend Minna. They talked about new books he didn't know, how often it rained, the future of the Directory in Paris. Johanna often answered him before he'd finished speaking. He thought about seizing her and pulling her down onto the ground, and knew for sure that she could read his thoughts. Did they have to go through all this hypocrisy? Of course it was necessary, and when he accidentally
touched her hand, he made a deep bow, as the nobility did, and she made a curtsey. On the way home he wondered if the day would ever come when people could deal with one another without lying. But before he could pursue that thought, he realized that every number could be expressed as the sum of three triangular numbers. Hands shaking, he groped for his pad, but he had left it at home by accident, and had to keep murmuring the formula softly to himself until they reached the next inn, where he tore a slate pencil out of the waiter's hand and scrawled it down on the tablecloth.

After that he never left his rooms. The days turned to evenings, the evenings to nights, which soaked up watery light in the early hours until day began again, all of it apparently as a matter of course. But it wasn't, death could arrive in a flash, he had to hurry. Sometimes Bartels came, bringing food. Sometimes his mother came. She stroked his head, looked at him with eyes swimming with love, and flushed with joy if he kissed her on the cheek. Then Zimmerman appeared, asked if he needed help with his work, saw his look, and went his way, mumbling in embarrassment. Letters from Lichtenberg, Böttner, and the secretary of the duke arrived; he didn't read any of them. Twice he had diarrhea, toothache three times, and one night such violent colic that he thought here it was, God wouldn't permit him to do this, the end was near. Another night, science, his work, his whole life all suddenly seemed strange and superfluous to him because he had no friend and no one apart from his mother to whom he meant anything. But that too passed, like everything else.

And then one rainy day, he was finished. He laid down his pen, blew his nose with extreme precision, and massaged his forehead. Already the memories of the last months, all the struggles, the decisions, the intellectual effort, were a thing
of the past. They were the experiences of someone he suddenly no longer was. In front of him was the manuscript that this previous self had left behind, hundreds of tightly written pages. He leafed through it and asked himself how he could have pulled it off. He recalled no inspiration, no flashes of illumination. Just work.

The costs of having it printed meant he had to borrow from Bartels, who was almost penniless himself. Then there were problems when he insisted on reproofing the typeset pages personally; the idiot of a bookseller simply didn’t understand that no one else was capable. Zimmerman wrote to the duke, who disgorged a little more money, and the Disquisitiones Arithmeticae could appear. He had just turned twenty and his life’s work was done. He knew: however long he remained on earth, he would never be able to achieve something comparable again.

He wrote a letter requesting Johanna’s hand in marriage, and was refused. It was nothing to do with him personally, she wrote, it was just that she doubted anyone could exist side by side with him. She suspected he absorbed life and strength from the people around him the way the earth absorbed the sun or the sea absorbed the rivers, and that his company would condemn her to the pallid semi-unreality of a ghostly existence.

He nodded. He had expected this answer, if not its excellent underpinnings. Now only one thing remained.

The journey was a nightmare. His mother wept so copiously when they said goodbye that he might have been leaving for China, and then, although he had sworn he wouldn’t, he wept too. The coach set off, and to begin with it was crammed with evil-smelling people; a woman ate raw eggs, shell and all, and a man kept up an uninterrupted stream of jokes that were blasphemous without being funny. Gauss tried to ignore it all
by reading the latest issue of the *Monthly Correspondence Concerning the Advancement of Global and Celestial Knowledge*. The astronomer Piazzi’s telescope had captured a ghost planet for several nights in a row, but before anyone could plot its course, it had vanished again. Perhaps an error, but then again perhaps a planetoid wandering between the inner and outer planets. But soon Gauss had to fold the newspaper away, as the sun was going down, the coach was jolting too much, and the egg-eating woman kept peeping over his shoulder. He closed his eyes. For a time he saw marching soldiers, then a firmament crisscrossed with magnetic lines, then Johanna, then he woke up. Rain was falling from a dull morning sky, but night was not over yet. The thought of more days and more nights, eleven and twenty-two respectively, beggared the imagination. Traveling was a horror!

When he reached Königsberg he was almost out of his mind with exhaustion, back pain, and boredom. He had no money for an inn, so he went straight to the university and got directions from a stupid-looking porter. Like everyone here, the man spoke a peculiar dialect, the streets looked foreign, the shops had signs that were incomprehensible, and the food in the taverns didn’t smell like food. He had never been so far from home.

At last he found the address. He knocked; after a long wait a dust-enshrouded old man opened the door and, before Gauss could introduce himself, said the most gracious gentleman was not receiving visitors.

Gauss tried to explain who he was and where he’d come from.

The most gracious gentleman, the servant repeated, was not receiving. He himself had been working here longer than
anyone would believe possible and he had never disobeyed an order.

Gauss pulled out letters of recommendation from Zimmer- 
man, Kästner, Lichtenberg, and Pfaff. He insisted, said Gauss
again. He could well imagine that there were a lot of visitors
and that self-protection was necessary. But, and he must say
this unequivocally, he was not just some nobody.

The servant had a think. His lips moved silently, and he
didn’t seem to know what to do next. Well, he murmured
eventually, went inside, and left the door open.

Gauss followed him hesitantly down a short, dark hallway
into a little room. It took a moment for his eyes to adjust to
the half-light before he saw an ill-fitting window, a table, an
armchair, and in it a motionless little dwarf wrapped in blank-
kets: puffy lips, protruding forehead, thin, sharp nose. The
eyes were half-open but didn’t look at him. The air was so
thick that it was almost impossible to breathe. Hoarsely he
enquired if this might be the professor.

Who else, said the servant.

He moved over to the armchair and with trembling hands
took out a copy of the Disquisitiones, on the flyleaf of which
he had inscribed some words of veneration and thanks. He
held out the book to the little man, but no hand lifted to take
it. The servant instructed him in a whisper to put the book on
the table.

In a hushed voice, he made his request: he had ideas he had
never been able to share with anyone. For example, it seemed
to him that Euclidean space did not, as per the Critique of Pure
Reason, dictate the form of our perceptions and thus of all pos-
sible varieties of experience, but was, rather, a fiction, a beau-
tiful dream. The truth was extremely strange: the proposition
that two given parallel lines never touched each other had never been provable, not by Euclid, not by anyone else. But it wasn’t at all obvious, as everyone had always assumed. He, Gauss, was thinking that the proposition was false. Perhaps there were no such things as parallels. Perhaps space also made it possible, provided one had a line and a point next to it, to draw infinite numbers of different parallels through this one point. Only one thing was certain: space was folded, bent, and extremely strange.

It felt good to utter all this out loud for the first time. The words were already coming faster, and his sentences were forming themselves of their own accord. This wasn’t just some intellectual game! He maintained that . . . He was moving toward the window but a horrified squeak from the little man brought him to a halt. He maintained that a triangle of sufficient size, stretched between three stars out there, if measured exactly would have a different sum of its angles from the hundred-and-eighty-degree assumed total, and thus would prove itself to be a spherical body. When he looked up, gesticulating, he saw the cobwebs on the ceiling, in layers, all woven together into a kind of mat. One day it would be possible to achieve measurements like that! But that was a long way off, and meanwhile he needed the opinion of the only man who wouldn’t think he was mad, and would definitely understand him. The man who had taught the world more about space and time than any other human being. He crouched down, so that his face was level with the little man’s. He waited. The little eyes looked at him.

Sausage, said Kant.

Pardon?

Buy sausage, said Kant to the servant. And stars. Buy stars too.
Gauss stood up.
I have not lost all my manners, said Kant. Gentlemen! A drop of spittle ran down his cheek.
The gracious gentleman was tired, said the servant.
Gauss nodded. The servant stroked Kant's cheek with the back of his hand. The little man smiled weakly. They went out, the servant said goodbye with a silent bow. Gauss would gladly have given him some money, but he had none. At a distance he heard dark voices singing. The prison choir, said the servant. They'd always mightily disturbed the gracious gentleman.

In the coach, jammed in between a pastor and a fat lieutenant who tried desperately to draw his fellow travelers into conversation, he read the article about the mysterious planet for the third time. Of course you could calculate its course! All you had to do was start from an ellipse rather than a circle when making your approximations and then go about it more skillfully than these idiots had done. A few days' work and you'd be able to predict when or where it would appear again. When the lieutenant asked his opinion about the Franco-Spanish alliance, he didn't know what to say.

Didn't he think, asked the lieutenant, it would be the end of Austria?
He shrugged his shoulders.
And this Bonaparte person?
I'm sorry, who? he asked.

Back in Brunswick he wrote another proposal to Johanna. Then he fetched the little bottle of curare from the poison cupboard at the Institute of Chemistry. Some researcher had recently sent it across the ocean along with a collection of plants, stones, and papers crammed with notes, a chemist had brought it here from Berlin, since when it had just been standing there, and nobody knew what to do with it. Apparently
even a tiny dose was deadly. They would tell his mother he had had a heart attack, without any warning, nothing to be done, God’s will. He summoned a messenger from the street, sealed the letter, and paid for it with his last coins. Then he stared out of the window and waited.

He uncorked the flask. The liquid had no smell. Would he hesitate? Probably. It was the kind of thing you didn’t know before you really tried it. But he was surprised to feel so little fear. The messenger would bring her refusal and then his death would be no more than a move in a chess game, something heaven hadn’t reckoned on. He had been sent into the world with an intellect that rendered almost everything human impossible, in a time when every task was hard, exhausting, and dirty. God had tried to make fun of him.

And the other possibility, now that the work had been written? Years of mediocrity, earning one’s bread in some degrading fashion, compromises, fear and vexation, more compromises, physical and spiritual pain, and the slow erosion of all faculties on the way to the feebleness of old age. No!

With astonishing clarity he became aware how violently he was trembling. He heard the roaring in his ears, observed the twitching in his hands, listened to his breath as it came in short gasps. He could almost find it funny.

A knock at the door. A voice, vaguely like his own, called, Come in!

The messenger came, pressed a piece of paper into his hand, and waited with an impertinent look for a tip. He found one more coin at the bottom of the bottommost drawer. The messenger threw it into the air, made a half turn, and caught it behind his back. Seconds later, he saw him running down the alley.

He thought about the Last Judgment. He didn’t believe any
such event would happen. Those accused could defend themselves, and many questions posed in rebuttal would make God quite uncomfortable. Insects. Dirt. Pain. The inadequacy of everything. Even time and space had been bungled. If he found himself before such a court, he would have a few things to say.

His hands numb, he opened Johanna’s letter, laid it aside, and reached for the little flask. Suddenly he had the feeling that there was something he had overlooked. He thought. Something unexpected had happened. He closed the bottle, thought harder, still couldn’t work out what it was. Then suddenly it dawned on him that what he had read was her acceptance.