

A BRAVER THING

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The palace banquet is predictably dull, but while the formal speeches roll on with their obligatory nods to the memory of Alfred Nobel and his famous bequest, it is not considered good manners to leave or to chat with one's neighbors. I have the time and opportunity to think about yesterday; and, at last, to decide on the speech that I will give tomorrow.

A Nobel prize in physics means different things to different people. If it is awarded late in life, it is often viewed by the recipient as the capstone on a career of accomplishment. Awarded early (Lawrence Bragg was a Nobel Laureate at twenty-five) it often defines the winner's future; an early Prize may also announce to the world at large the arrival of a new titan of science (Paul Dirac was a Nobel Laureate at thirty-one).

To read the names of the Nobel Prize winners in physics is almost to recapitulate the history of twentieth-century physics, so much so that the choice of winners often seems self-evident. No one can imagine a list without Planck, the Curies, Einstein, Bohr, Schrödinger, Dirac, Fermi, Yukawa, Bardeen, Feynman, Weinberg, or the several Wilsons (though Rutherford is, bizarrely, missing from the Physics roster, having been awarded his Nobel Prize in Chemistry).

And yet the decision-making process is far from simple. A Nobel Prize is awarded not for a lifetime's work, but explicitly for a particular achievement. It is given only to living persons, and as Alfred Nobel specified in his will, the prize goes to "the person who shall have made the most important discovery or invention within the field of physics."

It is those constraints that make the task of the Royal Swedish Academy of Sciences so difficult. Consider these questions:

. What should one do when an individual is regarded by his peers as one of the leading intellectual forces of his generation, but no single accomplishment offers the clear basis for an award? John Archibald

Wheeler is not a Nobel Laureate; yet he is a "physicist's physicist," a man who has been a creative force in half a dozen different fields.

. How does one weight a candidate's age

? In principle, not at all. It is not a variable for consideration;

but in practice every committee member knows when time is running out for older candidates, while the young competition will have opportunities for many years to come.

. How soon after a theory or discovery is it appropriate to make an award? Certainly, one should wait long enough to be sure that the accomplishment is "most important," as Nobel's will stipulates; but if one waits too long, the opportunity may vanish with the candidate. Max Born was seventy-two years old when he received the Nobel Prize in 1954—for work done almost thirty years earlier on the probabilistic interpretation of the quantum mechanical wave function. Had George Gamow lived as long as Born, surely he would have shared with Penzias and Wilson the 1978 prize, for the discovery of the cosmic background radiation. Einstein was awarded the Nobel Prize in 1921, at the age of forty-two. But it cited his work on the photoelectric effect, rather than the theory of relativity, which was still considered open to question. And if his life had been no longer than that of Henry Moseley or Heinrich Hertz, Einstein would have died unhonored by the Nobel Committee.

So much for logical choices. I conclude that the Nobel rules allow blind Atropos to play no less

a part than Athene in the award process.

My musings can afford to be quite detached. I know how the voting must have gone in my own case, since although the work for which my award is now being given was published only four years ago, already it has stimulated an unprecedented flood of other papers. Scores more are appearing every

week, in every language. The popular press might seem oblivious to the fundamental new view of nature implied by the theory associated with my name, but they are very aware of its monstrous practical potential. A small test unit in orbit around Neptune is already returning data, and in the tabloids I have been dubbed Giles "Starman" Turnbull. To quote The New York Times: "The situation is unprecedented in modern physics. Not even the madcap run from the 1986 work of Müller and Bednorz to today's room-temperature superconductors can compete with the rapid acceptance of Giles Turnbull's theories, and the stampede to apply them. The story is scarcely begun, but already we can say this, with confidence: Professor Turnbull has given us the stars."

The world desperately needs heroes. Today, it seems, I am a hero. Tomorrow? We shall see. In a taped television interview last week, I was asked how long my ideas had been gestating before I

wrote out the first version of the Turnbull Concession theory. And can you recall a moment or an event, asked the reporter, which you would pinpoint as seminal?

My answer must have been too vague to be satisfactory, since it did not appear in the final television clip. But in fact I could have provided a very precise location in spacetime, at the start of the road that led me to Stockholm, to this dinner, and to my first (and, I will guarantee, my last) meeting with Swedish royalty.

Eighteen years ago, it began. In late June, I was playing in a public park two miles from my home when I

found a leather satchel sitting underneath a bench. It was nine o'clock at night, and nearly dark. I took the satchel home with me.

My father's ideas of honesty and proper behavior were and are precise to a fault. He would allow me to examine the satchel long enough to determine its owner, but not enough to explore the contents. Thus it was, sitting in the kitchen of our semi-detached council house, that I first encountered the name of Arthur

Sandford Shaw, penned in careful red ink on the soft beige leather interior of the satchel. Below his name was an address on the other side of town, as far from the park as we were but in the opposite direction.

Should we telephone Arthur Sandford Shaw's house, tell him that we had his satchel, and advise him where he could collect it?

No, said my father gruffly. Tomorrow is Saturday. You cycle over in the morning and return it. To a fifteen-year old, even one without specific plans, a Saturday morning in June is precious. I hated my father then, for his unswerving, blinkered attitude, as I hated him for the next seventeen years. Only recently have I realized that 'hate' is a word with a thousand meanings.

I rode over the next morning. Twice I had to stop and ask my way. The Shaw house was in the Garden

Village part of the town, an area that I seldom visited. The weather was preposterously hot, and at my father's insistence I was wearing a jacket and tie. By the time that I dismounted in front of the yellow brick house with its steep red-tile roof and diamond glazed windows, sweat was trickling down my face and neck. I leaned my bike against a privet hedge that was studded with sweet-smelling and tiny white flowers, lifted the satchel out of my saddle-bag, and rubbed my sleeve across my forehead.

I peered through the double gates. They led to an oval driveway, enclosing a bed of well-kept

annuals.

I saw pansies, love-in-a-mist, delphiniums, phlox, and snapdragons. I know their names now, but of course I did not know them then

And if you ask me, do I truly remember this so clearly, I must say, of course I do; and will, until my last goodnight. I have that sort of memory. Lev Landau once said, "I am not a genius. Einstein and Bohr are geniuses. But I am very talented." To my mind, Landau (1962 Nobel Laureate, and the premier Soviet physicist of his generation) was certainly a genius. But I will echo him, and say that while I am not a genius, I am certainly very talented. My memory in particular has always been unusually precise and complete.

The sides of the drive curved symmetrically around to meet at a brown-and-white painted front door. I

followed the edge of the gravel as far as the front step, and there I hesitated.

For my age, I was not lacking in self-confidence. I had surveyed the students in my school, and seen nothing there to produce discomfort. It was clear to me that I was mentally far superior to all of them, and the uneasy attitude of my teachers was evidence—to me, at any rate—that they agreed with my assessment.

But this place overwhelmed me. And not just with the size of the house, though that was six times as big as the one that I lived in. I had seen other big houses; far more disconcerting were the trained climbing roses and espaliered fruit trees, the weed-free lawn, the bird-feeders, and the height, texture and improbable but right color balance within the flower beds. The garden was so carefully structured that it seemed a logical extension of the building at its center. For the first time, I realized that a garden could comprise more than a hodge-podge of grass and straggly flowers.

So I hesitated. And before I could summon my resolve and lift the brass knocker, the door opened.

A woman stood there. At five-feet five, she matched my height exactly. She smiled at me, eye to eye.

Did I say that the road to Stockholm began when I found the satchel? I was wrong. It began with that smile.

"Yes? Can I help you?"

The voice was one that I still thought of as "posh," high-pitched and musical, with clear vowels. The woman was smiling again, straight white teeth and a broad mouth in a high-cheekboned face framed by curly, ash-blond hair. I can see that face before me now, and I know intellectually that she was thirty-five years old. But on that day I could not guess her age to within fifteen years. She could have been twenty, or thirty, or fifty, and it would have made no difference. She was wearing a pale-blue blouse with full sleeves, secured at the top with a mother-of-pearl brooch and tucked into a grey wool skirt that descended to mid-calf. On her feet she wore low-heeled tan shoes, and no stockings.

I found my voice.

"I've brought this back." I held out the satchel, my defense against witchcraft.

"So I see." She took it from me. "Drat that boy, I doubt it he even knows he lost it. I'm Marion Shaw.

Come in."

It was an order. I closed the door behind me and found myself following her along a hall that passed another open door on the left. As we approached, a piano started playing rapid staccato triplets, and I

saw a red-haired girl crouched over the keyboard of a baby grand.

My guide paused and stuck her head in for a moment. "Not so fast, Meg. You'll never keep up that

pace for the whole song." And then to me, as we walked on, "Poor old Schubert, 'Impatience' is right, it's what he'd feel if he heard that. Do you play?"

"We don't have a piano."

"Mm. I sometimes wonder why we do."

We had reached an airy room that faced the back garden of the house. My guide went in before me, peered behind the door, and clucked in annoyance.

"Arthur's gone again. Well, he can't be far. I know for a fact that he was here five minutes ago." She turned to me. "Make yourself at home, Giles. I'll find him."

Giles

. I have been terribly self-conscious about my first name since I was nine years old. By the time that I was twenty I had learned how to use it to my advantage, to suggest a lineage that I never had. But at fifteen it was the bane of my life. In a class full of Tom's and Ron's and Brian's and Bill's, it did not fit. I

cursed my fate, to be stuck with a "funny" name, just because one of my long-dead uncles had suffered with it.

But there was stronger witchcraft at work here. I had arrived unheralded on her doorstep.

"How do you know my name?"

That earned another smile. "From your father. He called me early this morning, to make sure someone would be home. He didn't want you to bike all this way for nothing." She went out, and left me in the room of my dreams.

It was about twelve feet square, with an uncarpeted floor of polished hardwood. All across the far wall was a window that began at waist height, ran to the ceiling, and looked south to a vegetable garden. The window sill was a long work bench, two feet deep, and on it stood a dozen projects that I could identify.

In the center was a compound microscope, with slides scattered all around. I found tiny objects on them as various as a fly's leg, a single strand of hair, and two or three iron filings. The mess on the left-hand side of the bench was a half-ground telescope lens, covered with its layer of hardened pitch and with the grinding surface sitting next to it. The right side, just as disorderly, was a partially-assembled model airplane, radio-controlled and with a two c.c. diesel engine. Next to that stood an electronic balance, designed to weigh anything from a milligram to a couple of kilos, and on the other side was a blood-type testing kit. The only discordant note to my squeamish taste was a dead puppy, carefully dissected, laid out, and pinned organ by organ on a two-foot square of thick hardboard. But that hint of a possible future was overwhelmed by the most important thing of all: everywhere, in among the experiments and on the floor and by the two free-standing aquariums and next to the flat plastic box behind the door with its half-inch of water and its four black-backed, fawn-bellied newts, there were books

. Books and books and books. The other three walls of the room were shelved and loaded from floor to ceiling, and the volumes that scattered the work bench were no more than a small sample that had been taken out and not replaced. I had never seen so many hard-cover books outside a public library or the town's one and only technical bookstore.

When Marion Shaw returned with Arthur Sandford Shaw in tow I was standing in the middle of the room like Buridan's Ass, unable to decide what I wanted to look at the most. I was in no position to see my own eyes, but if I had been able to do so I have no doubt that the pupils would have been twice their normal size. I was suffering from sensory overload, first from the house and garden, then from Marion

Shaw, and finally from that paradise of a study. Thus my initial impressions of someone whose life so powerfully influenced and finally directed my own are not as clear in my mind as they ought to be. I also honestly believe that I never did see Arthur clearly, if his mother were in the room.

Some things I can be sure of. Arthur Shaw made his height early, and although I eventually grew to within an inch of him, at our first meeting he towered over me by seven or eight inches. His coordination had not kept pace with his growth, and he had a gawky and awkward manner of moving that would never completely disappear. I know also that he was holding in his right hand a live frog that he had brought in from the garden, because he had to pop that in an aquarium before he could, at his mother's insistence, shake hands with me.

For the rest, his expression was surely the half-amused, half-bemused smile that seldom left his face. His hair, neatly enough cut, never looked it. Some stray spike on top always managed to elude brush and comb, and his habit of running his hands up past his temples swept his hair untidily off his forehead.

"I'm pleased to meet you," he said. "Thank you for bringing it back."

He was, I think, neither pleased nor displeased to meet me. It was nice to have his satchel back (as

Marion Shaw had predicted, he did not know he had left it behind in the park), but the thought of what might have happened had he lost it, with its cargo of schoolbooks, did not disturb him as it would have disturbed me.

His mother had been following my eyes.

"Why don't you show Giles your things," she said. "I'll bet that he's interested in science, too."

It was an implied question. I nodded.

"And why don't I call your mother," she said, "and see if it's all right for you to stay to lunch?"

"My mother's dead." I wanted to stay to lunch, desperately. "And my dad will be at work 'til late."

She raised her eyebrows, but all she said was, "So that's settled, then." She held out her hand.

"Let me take your jacket, you don't need that while you're indoors."

Mrs. Shaw left to organize lunch. We played, though Arthur Shaw and I would both have been outraged to hear such a verb applied to our efforts. We were engaging in serious experiments of chemistry and physics, and reviewing the notebooks in which he recorded all his earlier results. Even in our first meeting he struck me as a bit strange, but that slight negative was swamped by a dozen positive reactions. The orbit in which I had traveled all my life contained no one whose interests in any way resembled my own.

It was doubly shocking to meet a person who was as interested in science as I was, and who had on the shelves of his own study more reference sources than I dreamed existed.

Lunch was an unwelcome distraction. Mrs. Shaw studied me as openly as my inspection of her was covert, Arthur sat in thoughtful silence, and the table conversation was dominated by the precocious

Megan, who at twelve years old apparently loved horses and boats, hated anything to do with science, school-work, or playing the piano, and talked incessantly when I badly wanted to hear from the other two. (I know her still; my present opinion is that I was a little harsh in the assessment of eighteen years ago—but not much.) Large quantities of superior food and the beatific presence of Marion Shaw saved lunch from being a disaster, and finally Arthur and I could escape back to his room.

At five o'clock I felt obliged to leave and cycle home. I had to make dinner for my father. The jacket that was returned to me was newly stitched at the elbow where a leather patch had been working loose, and a missing black button on the cuff had been replaced. It was Marion Shaw

rather than Arthur who handed me my coat and invited me to come to the house again the following week, but knowing her as I do now I feel sure that the matter was discussed with him before the offer was made. I mention as proof of my theory that as I was pulling my bike free of the privet hedge, Arthur pushed into my hand a copy of

E.T. Bell's

Men Of Mathematics

. "It's pretty old," he said offhandedly. "And it doesn't give enough details. But it's a classic. I think it's terrific—and so does Mother."

I rode home through the middle of town. When I arrived there, my own house felt as alien and inhospitable to me as the far side of the moon.

It was Tristram Shandy who set out to write the story of his life, and never progressed much beyond the day of his birth.

If I am to avoid a similar problem, I must move rapidly in covering the next few years. And yet at the same time it is vital to define the relationship between the Shaw family and me, if the preposterous request that Marion Shaw would make of me thirteen years later, and my instant acquiescence to it, are to be of value in defining the road to Stockholm.

For the next twenty-seven months I enjoyed a double existence. "Enjoyed" is precisely right, since I

found both lives intensely pleasurable. In one world I was Giles Turnbull, the son of a heel-man at

Hendry's Shoe Factory, as well as Giles Turnbull, student extraordinary, over whom the teachers at my school nodded their heads and for whom they predicted a golden scholastic future. In that life, I moved through a thrilling but in retrospect unremarkable sequence of heterosexual relationships, with Angela, Louise, and finally with Jennie.

At the same time, I became a regular weekend visitor to the Shaw household. Roland Shaw, whom my own father described with grudging respect after two meetings as "sharp as a tack," had a peripheral effect on me, but he was a seldom-seen figure absorbed in his job, family, and garden. It was Marion and

Arthur who changed me and shaped me. From him I learned concentration, tenacity, and total attack on a single scientific problem (the school in my other life rewarded facility and speed, not depth). I learned that there were many right approaches, since he and I seldom used the same attack on a problem. I also learned—surprisingly—that there might be more than one right answer. One day he casually asked me, "What's the average length of a chord in a unit circle?" When I had worked out an answer, he pointed out with glee that it was a trick question. There are at least three "right" answers, depending on the mathematical definition you use for "average."

Arthur taught me thoroughness and subtlety. From Marion Shaw I learned everything else. She introduced me to Mozart, to the Chopin waltzes and études, to the Beethoven symphonies, and to the first great Schubert song cycle, while steering me clear of Bach fugues, the Ring of the Nibelung, Beethoven's late string quartets and

Winterreise

. "There's a place for those, later in life," she said, "and it's a wonderful place. But until you're twenty you'll get more out of

Die Schöne Müllerin and

Beethoven's Seventh." Over the dinner table, I learned why sane people might actually read Wordsworth and Milton, to whom an exposure at school had generated an instant and strong distaste. ("Boring old farts," I called them, though never to Marion Shaw.)

And although nothing could ever give me a personal appreciation for art and sculpture, I learned a more important lesson: that there were people who could tell the good from the bad,

and the ugly from the beautiful, as quickly and as naturally as Arthur and I could separate a rigorous mathematical proof from a

flawed one, or a beautiful theory from an ugly one.

The Shaw household also taught me, certainly with no intention to do so, how to fake it. Soon I could talk a plausible line on music, literature, or architecture, and with subtle hints from Marion I mastered that most difficult technique, when to shut up. From certain loathed guests at her dinner table I learned to turn on (and off) a high-flown, euphuistic manner of speech that most of the world confuses with brain-power.

And finally, walking around the garden with Marion for the sheer pleasure of her company, I picked up as a bonus a conversational knowledge of flowers, insects, and horticulture, subjects which interested me as little as the sequence of Chinese dynasties.

It's obvious, is it not, that I was in love with her? But it was a pure, asexual love that bore no relationship to the explorations, thrills, and physical urgencies of Angela, Louise, and Jennie. And if I describe a paragon who sat somewhere between Saint and Superwoman, it is only because I saw her that way when I was sixteen years old, and I have never quite lost the illusion. I know very well, today, that

Marion was a creature of her environment, as much as I was shaped by mine. She had been born to money, and she had never had to worry about it. It was inevitable that what she thought she was teaching me would become transformed when I took it to a house without books and servants, and to a way of life where the battle for creature comforts and self-esteem was fought daily.

I looked upon the world of Marion Shaw, and wanted it and her. Desperately. But I knew no way to possess them.

"It were all one that I should love a bright particular star, and think to wed it, he is so above me,"

Marion quoted to me one day, for no reason I could understand. That's how I, mute and inglorious, felt about her.

And by a curious symmetry, Megan Shaw trailed lovelorn after me, just as I trailed after her mother.

One day, to my unspeakable embarrassment, Megan cornered me in the music room and told me that she loved me. She took the initiative, and tried to kiss me. At fourteen she was becoming a beauty, but I, who readily took the part of eager sexual aggressor with my girl friends, could no more have touched her than I could have played the Chopin polonaise with which she had been struggling. I muttered, mumbled, ducked my head, and ran.

Despite such isolated moments of awkwardness, that period was still my personal Nirvana, a delight in the sun that is young once only. But even at sixteen and seventeen I sensed that, like any perfection, this one could not endure.

The end came after two years, when Arthur went off to the university. He and I were separated in age by only six months, but we went to different schools and we were, more important, on opposite sides of the Great Divide of the school year.

He had taken the Cambridge scholarship entrance exam the previous January and been accepted at

Kings College, without covering himself with glory. If his failure to gain a scholarship or exhibition upset his teachers, it surprised me not at all. And when I say that I knew Arthur better than anyone, while still not knowing him, that makes sense to me if to no one else.

Success in the Cambridge scholarship entrance examinations in mathematics calls for a good deal of ingenuity and algebraic technique, but the road to success is much smoother if you also know certain tricks. Only a finite number of questions can be asked, and certain problems appear again and again. A

bright student, without being in any way outstanding, can do rather well by practicing on the papers set in previous years.

And this, of course, was what Arthur absolutely refused to do. He had that rare independence of spirit, which disdained to walk the well-trod paths. He would not practice examination technique. That made the exams immeasurably harder. A result which, with the help of a clever choice of coordinate system or transformation, dropped out in half a dozen lines, would take several pages of laborious algebra by a direct approach. Genius would find that trick of technique in real time, but to do so consistently, over several days, was too much to ask of any student. Given Arthur's fondness for approaching a problem ab ovo, without reference to previous results, and adding to it a certain obscurity of presentation that even

I, who knew him well, had found disturbing, it was a wonder that he had done as well as he had. I had observed what happened. It took no great intellect to resolve that I would not make the same mistake. I worked with Arthur, until his departure for Cambridge in early October, on new fields of study

(I had long passed the limits of my teachers at school). Then I changed my focus, and concentrated on the specifics of knowledge and technique needed to do well in the entrance examinations.

Tests of any kind always produce in me a pleasurable high of adrenalin. In early December I went off to

Cambridge, buoyed by a good luck kiss (my first) from Marion Shaw, and a terse, "Do your best, lad,"

from my father. I stayed in Trinity College, took the exams without major trauma, saw a good deal of

Arthur, and generally had a wonderful time. I already knew something of the town, from a visit to Arthur halfway through Michaelmas Term.

The results came just before Christmas. I had won a major scholarship to Trinity. I went up the following

October.

And at that point, to my surprise, my course and Arthur's began to move apart. We were of course in different colleges, and of different years, and I began to make new friends. But more important, back in our home town the bond between us had seemed unique: he was the single person in my world who was interested in the arcana of physics and mathematics. Now I had been transported to an intellectual heaven, where conversations once possible only with Arthur were the daily discourse of hundreds.

I recognized those changes of setting, and I used them to explain to Marion Shaw why Arthur and I no longer saw much of each other. I also, for my own reasons, minimized to her the degree of our estrangement; for if I were never to see Arthur during college breaks, I would also not see Marion.

There were deeper reasons, though, for the divergence, facts which I could not mention to her. While the university atmosphere, with its undergraduate enthusiasms and overflowing intellectual energy, opened me and made me more gregarious, so that I formed dozens of new friendships with both men and women, college life had exactly the opposite effect on Arthur. As an adolescent he had tended to emotional coolness and intellectual solitude. At Cambridge those traits became more pronounced. He attended few lectures, worked only in his rooms or in the library, and sought no friends. He became somewhat nocturnal, and his manner was increasingly brusque and tactless.

That sounds enough to end close acquaintance; but there was a deeper reason still, one harder to put my finger on. The only thing I can say is that Arthur now made me highly uncomfortable

. There was a look in his eyes, of obsession and secret worry, that kept me on the edge of my seat. I wondered if he had become homosexual, and was enduring the rite of passage that implied. There had been no evidence of such tendencies during the years I had known him, except that he had shown no interest in girls.

A quiet check with a couple of my gay friends disposed of that theory. Both the grapevine and their personal observations of Arthur indicated that if he was not attracted to women, neither was he interested in men. That was a vast relief. I had seen myself being asked to explain the inexplicable to Marion Shaw.

I accepted the realities: Arthur did not want to be with me, and I was uncomfortable with him. So be it. I

would go on with my studies.

And in those studies our new and more distant relationship had another effect, one that ultimately proved far more important than personal likes and dislikes. For I could no longer compare myself with Arthur.

In our first two years of acquaintance, he had been my calibration point. As someone a little older than me, and a full year ahead in a better school, he served as my pacer. My desire was to know what Arthur knew, to be able to solve the problems that he could solve. And on the infrequent occasions when I

found myself ahead of him, I was disproportionately pleased.

Now my pace-setting hare had gone. The divergence that I mentioned was intellectual as well as personal. And because Arthur had always been my standard of comparison, it took me three or four years to form a conclusion that others at the university had drawn long before.

His lack of interest in attending lectures, coupled with his insistence on doing things his own way, led to as many problems in the Tripos examinations as it had in scholarship entrance. His supervision partner found him "goofy," while their supervisor didn't seem to understand what he was talking about. Arthur was always going off, said his partner, in irrelevant digressions . By contrast, my old approach of focusing on what was needed to do well in exams, while making friends with both students and faculty, worked as well as ever.

In sum, my star was ascendant. I did splendidly, was secretly delighted, and publicly remained nonchalant and modest.

And yet I knew, somewhere deep inside, that Arthur was more creative than I. He generated ideas and insights that I would never have. Surely that would weigh most heavily, in the great balance of academic affairs?

Apparently not. To my surprise, it was I alone who at the end of undergraduate and graduate studies was elected to a Fellowship, and stayed on at Cambridge. Arthur would have to leave, and fend for himself. After considering a number of teaching positions at other universities both in Britain and abroad, he turned his back on academia. He accepted a position as a research physicist with ANF Gesellschaft, a

European hi-tech conglomerate headquartered in Bonn.

In August he departed Cambridge to take up his new duties. I would remain, living in college and continuing my research. When we had dinner together a few days before he left he seemed withdrawn, but no more than usual. I mentioned that I was becoming more and more interested in the problem of space-time quantization, and proposed to work on it intensely. He came to life then, and said that in his opinion I was referring to the most important open question of physics. I was delighted by that reaction, and told him so. At that point his moodiness returned, and remained for the rest of the evening.

When we parted at midnight there was no formality or sense of finality in our leave-taking. And yet for several years I believed that on that evening the divergence of our worldlines became complete. Only later did I learn that from a scientific point of view they had separated, only to

run parallel to each other.
And both roads led to Stockholm.

When one sets forth on an unknown intellectual trail it is easy to lose track of time, place, and people.

For the next four years the sharp realities of my world were variational principles, Lie algebra, and field theory. Food and drink, concerts, vacations, friends, social events, and even lovers still had their place, but they stood on the periphery of my attention, slightly misty and out of focus. I saw Arthur a total of five times in those four years, and each was in a dinner-party setting at his parents' house. In retrospect I can recognize an increasing remoteness in his manner, but at the time he seemed like the same old Arthur, ignoring any discussion or guest that didn't interest him. No opportunity existed for deep conversation between us; neither of us sought one. He never said a word about his work, or what he thought of life in Bonn. I never talked about what I was trying to do in Cambridge.

It was the shock of my life to be sitting at tea in the Senate House, one gloomy November afternoon, and be asked by a topologist colleague from Churchill College, "You used to hang around with Arthur

Shaw, didn't you, when he was here?"

At my nod, he tapped the paper he was holding. "Did you see this, Turnbull," he said. "On page ten?

He's dead."

And when I looked at him, stupefied: "You didn't know? Committed suicide. In Germany. His obituary's here."

He said more, I'm sure, and so did I. But my mind was far away as I took the newspaper from him. It was a discreet two inches of newsprint. Arthur Sandford Shaw, aged twenty-eight.

Graduate of King's

College, Cambridge, son of etc. Coroner's report, recent behavior seriously disturbed ... no details.

I went back to my rooms in Trinity and telephoned the Shaw house. While it was ringing, I realized that no matter who answered I had no idea what to say. I put the phone back on its stand and paced up and down my study for the next hour, feeling more and more sick. Finally I made the call and it was picked up by Marion.

I stumbled through an expression of regret. She hardly gave me time to finish before she said, "Giles, I

was going to call you tonight. I'd like to come to Cambridge. I must talk to you."

The next day I had scheduled appointments for late morning and afternoon, two with research students, one with the college director of studies on the subject of forthcoming entrance interviews, and one with a visiting professor from Columbia. I could have handled them and still met with Marion. I cancelled every one, and went to meet her at the station.

The only thing I could think of when I saw her step off the train was that she had changed hardly at all since that June morning, thirteen years ago, when we first met. It took close inspection to see that the ash-blond hair showed wisps of grey at the temples, and that a network of fine lines had appeared at the outer corner of her eyes.

Neither of us had anything to say. I put my arms around her and gave her an embarrassed hug, and she leaned her head for a moment on my shoulder. In the taxi back to college we talked the talk of strangers, about the American election results, new compact disk recordings, and the town's worsening traffic problems.

We did not go to my rooms, but set out at once to walk on the near-deserted paths of the College

Backs. The gloom of the previous afternoon had intensified. It was perfect weather for weltenschmerz, cloudy and dark, with a thin drizzle falling. We stared at the crestfallen ducks on the Cam and the near-leafless oaks, while I waited for her to begin. I sensed that she was winding herself up to say

something unpleasant. I tried to prepare myself for anything.

It came with a sigh, and a murmured, "He didn't kill himself, you know. That's what the report said, but it's wrong. He was murdered."

I was not prepared for anything. The hair rose on the back of my neck.

"It sounds insane," she went on. "But I'm sure of it. You see, when Arthur was home in June, he did something that he'd never done before. He talked to me about his work. I didn't understand half of it"—she smiled, a tremulous, tentative smile; I noticed that her eyes were slightly bloodshot from weeping—"you'd probably say not even a tenth of it. But I could tell that he was terrifically excited, and at the same time terribly worried and depressed."

"But what was he doing? Wasn't he working for that German company?" I was ashamed to admit it, but in my preoccupation with my own research I had not given a moment's thought in four years to Arthur's doings, or to ANF Gesellschaft.

"He was still there. He was in his office the morning of the day that he died. And what he was doing was terribly important."

"You talked to them?"

"They talked to us. The chief man involved with Arthur's work is called Otto Braun, and he flew over two days ago specially to talk to me and Roland. He said he wanted to be sure we would hear about

Arthur's death directly, rather than just being officially notified. Braun admitted that Arthur had done very important work for them."

"But if that's true, it makes no sense at all for anyone to think of killing him. They'd do all they could to keep him alive."

"Not if he'd found something they were desperate to keep secret. They're a commercial operation.

Suppose that he found something hugely valuable? And suppose that he told them that it was too important for one company to own, and he was going to let everyone in on it."

It sounded to me like a form of paranoia that I would never have expected in Marion Shaw.

Arthur would certainly have been obliged to sign a non-disclosure agreement with the company he worked for, and there were many legal ways to assure his silence. In any case, to a hi-tech firm Arthur and people like him were the golden goose. Companies didn't murder their most valuable employees.

We were walking slowly across the Bridge of Sighs, our footsteps echoing from the stony arch. Neither of us spoke until we had strolled all the way through the first three courts of St. Johns College, and turned right onto Trinity Street.

"I know you think I'm making all this up," said Marion at last, "just because I'm so upset. You're just humoring me. You're so logical and clear-headed, Giles, you never let yourself go overboard about anything."

There is a special hell for those who feel but cannot tell. I started to protest, half-heartedly.

"That's all right," she said. "You don't have to be polite to me. We've known each other too long. You don't think I understand anything about science, and maybe I don't. But you'll admit that I know a fair bit

about people. And I can tell you one thing, Otto Braun was keeping something from us.

Something important."

"How do you know?"

"I could read it in his eyes."

That was an unarguable statement; but it was not persuasive. The drizzle was slowly turning into a persistent rain, and I steered us away from Kings Parade and towards a coffee shop. As we passed through the doorway she took my arm.

"Giles, do you remember Arthur's notebooks?"

It was a rhetorical question. Anyone who knew Arthur knew his notebooks. Maintaining them was his closest approach to a religious ritual. He had started the first one when he was twelve years old. A

combination of personal diary, scientific workbook, and clipping album, they recorded everything in his life that he believed to be significant.

"He still kept them when he went to Germany," Marion continued. "He even mentioned them, the last time he was home, because he wanted me to send him the same sort of book that he always used, and he had trouble getting them there. I sent him a shipment in August. I asked Otto Braun to send them back to me, with Arthur's personal things. He told me there were no notebooks. There were only the work journals that every employee of ANF was obliged to keep."

I stared at her across the little table, with its red-and-white checkered cloth. At last, Marion was offering evidence for her case. I moved the salt and pepper shakers around on the table. Arthur may have changed in the past four years, but he couldn't have changed that much. Habits were habits.

She leaned forward, and put her hands over mine. "I know. I said to Braun just what you're thinking.

Arthur always kept notebooks. They had to exist, and after his death they belonged to me. I wanted them back. He wriggled and sweated, and said there was nothing. But if I want to know what Arthur had left, he said, I can get someone I trust who'll understand Arthur's work, and have them go over to Bonn.

Otto Braun will let them see everything there is."

She gazed at me with troubled grey eyes.

I picked up my coffee cup and took an unwanted sip. Some requests for help were simply too much.

The next two weeks were going to be chaotic. I had a horrendous schedule, with three promised papers to complete, two London meetings to attend, half a dozen important seminars, and four out-of-town visitors. I had to explain to her somehow that there was no way for me to postpone any part of it.

But first I had to explain matters to someone else. I

had been in love with Marion Shaw, I told myself, there was no use denying it. Hopelessly, and desperately, and mutely. She had been at one time my inamorata

, my goddess, the central current of my being; but that was ten years ago. First love's impassioned blindness had long since passed away in colder light.

I opened my mouth to say that I could not help.

Except that this was still my Maid Marion, and she needed me.

The next morning I was on my way to Bonn.

* * * *

Otto Braun was a tall, heavily-built man in his mid-thirties, with a fleshy face, a high forehead, and swept back dark hair. He had the imposing and slightly doltish look of a Wagnerian heldentenor

—an appearance that I soon learned was totally deceptive. Otto Braun had the brains of a dozen

Siegfrieds, and his command of idiomatic English was so good that his slight German accent seemed like an affectation.

"We made use of certain ancient principles in designing our research facility," he said, as we zipped along the Autobahn in his Peugeot. "Don't be misled by its appearance."

He had insisted on meeting me at Wahn Airport, and driving me (at eighty-five miles an hour) to the company's plant. I studied him, while to my relief he kept his eyes on the road ahead and the other traffic.

I could not detect in him any of the shiftiness that Marion Shaw had described. What I did sense was a forced cheerfulness. Otto Braun was uneasy.

"The monasteries of northern Europe were designed to encourage deep meditation," he went on. "Small noise-proof cells, hours of solitary confinement, speech only at certain times and places. Well, deep meditation is what we're after. Of course, we've added a few modern comforts—heat, light, coffee, computers, and a decent cafeteria." He smiled. "So don't worry about your accommodation. Our guest quarters at the lab receive high ratings from visitors. You can see the place now, coming into view over on the left."

I had been instructed not to judge by appearances. Otherwise, I would have taken the research facility of ANF Gesellschaft to be the largest concrete prison blockhouse I had ever seen.

Windowless, and surrounded by smooth lawns that ended in a tall fence, it stood fifty feet high and several hundred long.

All it needed were guard dogs and machine-gun towers.

Otto Braun drove us through the heavy, automatically-opening gates and parked by a side entrance.

"No security?" I said.

He grinned, his first sign of genuine amusement. "Try getting out without the right credentials, Herr

Doktor Professor Turnbull."

We traversed a deserted entrance hall to a quiet, carpeted corridor, went up in a noiseless elevator, and walked along to an office about three meters square. It contained a computer, a terminal, a desk, two chairs, a blackboard, a filing cabinet, and a book-case.

"Notice anything unusual about this room?" he said.

I had, in the first second. "No telephone."

"Very perceptive. The devil's device. Do you know, in eleven years of operation, no one has ever complained about its absence? Every office, including my own, is the same size and shape and has the same equipment in it. We have conference rooms for the larger meetings. This was Dr. Shaw's office and it is, in all essentials, exactly as he left it."

I stared around me with increased interest. He gestured to one of the chair, and didn't take his eyes off me.

"Mrs. Shaw told me you were his best friend," he said. It was midway between a question and a statement.

"I knew him since we were both teenagers," I replied. And then, since that was not quite enough, "I was probably as close a friend as he had. But Arthur did not encourage close acquaintance."

He nodded. "That makes perfect sense to me. Dr. Shaw was perhaps the most talented and valuable employee we have ever had. His work on quantized Hall effect devices was unique, and made many millions of marks for the company. We rewarded him well and esteemed his work highly. Yet he was not someone who was easy to know." His eyes were dark and alert, half-hidden in that pudgy face. They focused on me with a higher intensity level. "And Mrs. Shaw. Do you know her well?"

"As well as I know anyone."

"And you have a high regard for each other?"

"She has been like a mother to me."

"Then did she confide in you her worry—that her son Arthur did not die by his own hand, and his death was in some way connected with our company?"

"Yes, she did." My opinion of Otto Braun was changing. He had something to hide, as Marion had said, but he was less and less the likely villain. "Did she tell you that?"

"No. I was forced to infer it, from her questions about what he was doing for us. Hmph." Braun rubbed at his jowls. "Herr Turnbull, I find myself in a most difficult situation. I want to be as honest with you as I can, just as I wanted to be honest with Mr. and Mrs. Shaw. But there were things I could not tell them. I

am forced to ask again: is your concern for Mrs. Shaw sufficient that you are willing to suppress certain facts from her? Please understand, I am not suggesting any form of criminal behavior. I am concerned only to minimize sorrow."

"I can't answer that question unless I know what the facts are. But I think the world of Marion Shaw. I'll do anything I can to make the loss of her son easier for her."

"Very well." He sighed. "I will begin with something that you could find out for yourself, from official sources. Mrs. Shaw thinks there was some sort of foul play in Arthur Shaw's death. I assure you that he took his own life, and the proof of that is provided by the curious manner of his death. Do you know how he died?"

"Only that it was in his apartment."

"It was. But he chose to leave this world in a way that I have never before encountered." Dr. Shaw removed from the lab a large plastic storage bag, big enough to hold a mattress. "It is equipped with a zipper along the outside, and when that zipper is closed, such a bag is quite airtight." He paused. Otto

Braun was no machine. This explanation was giving him trouble. "Dr. Shaw took it to his apartment. At about six o'clock at night he turned the bag inside out and placed it on top of his bed. Then he changed to his pajamas, climbed into the bag, and zipped it from the inside. Sometime during that evening he died, of asphyxiation." He looked at me unhappily. "I am no expert in 'locked room' mysteries, Professor

Turnbull, but the police made a thorough investigation. They are quite sure that no one could have closed that bag from the outside. Dr. Shaw took his own life, in a unique and perverse way."

"I see why you didn't want Mr. and Mrs. Shaw to know this. Let me assure you that they won't learn it from me." I felt nauseated. Now that I knew how Arthur had died, I would have rather remained ignorant.

He raised dark eyebrows. "But they do know, Professor Turnbull. Naturally, they insisted on seeing the coroner's report on the manner of his death, and I was in no position to keep such information from them.

Mrs. Shaw's suspicion of me arose from a quite different incident. It came when she asked me to return

Dr. Shaw's journals to her."

"And you refused."

"Not exactly. I denied their existence. Maybe that was a mistake, but I do not pretend to be infallible. If you judge after examination that the books should be released to Dr. Shaw's parents, I will permit it to happen." Otto Braun stood up and went across to the grey metal file cabinet. He patted the side of it.

"These contain Arthur Shaw's complete journals. On the day of his death, he took them all and placed them in one of the red trash containers in the corridor, from which they would go to the shredder and incinerator. I should explain that at ANF we have many commercial secrets, and

we are careful not to allow our competitors to benefit from our garbage. Dr. Shaw surely believed that his notebooks would be destroyed that night."

He pulled open a file drawer, and I saw the familiar spiral twelve-by-sixteen ledgers that Arthur had favored since childhood.

"As you see, they were not burned or shredded," Braun went on. "In the past we've had occasional accidents, in which valuable papers were placed by oversight into the red containers. So our cleaning staff—all trusted employees—are instructed to check with me if they see anything that looks like a mistake. An alert employee retrieved all these notebooks and brought them to me, asking approval to destroy them."

It seemed to me that Marion Shaw had been right on at least one thing. For if after examining Arthur's ledgers, Otto Braun had not let them be destroyed, they must contain material of value to ANF.

I said this to him, and he shook his head. "The notebooks had to be kept, in case they were needed as evidence for the investigation of death by suicide. They were, in fact, one of the reasons why I am convinced that Dr. Shaw took his own life. Otherwise I would have burned them. Every piece of work that Dr. Shaw did relevant to ANF activities was separately recorded in our ANF work logs. His own notebooks..." He paused. "Beyond that, I should not go. You will draw your own conclusions."

He moved away from the cabinet, and steered me with him towards the door. "It is six o'clock, Professor, and I must attend our weekly staff meeting. With your permission, I will show you to your room and then leave you. We can meet tomorrow morning. Let me warn you. You were his friend; be prepared for a shock."

He would make no other comment as we walked to the well-furnished suite that had been prepared for me, other than to say again, as he was leaving, "It is better if you draw your own conclusions. Be ready for a disturbing evening."

The next morning I was still studying Arthur's notebooks.

It is astonishing how, even after five years, my mind reaches for that thought. When I relive my three days in Bonn I feel recollection rushing on, faster and faster, until I reach the point where Otto Braun left me alone in my room. And then memory leaps out towards the next morning, trying to clear the dark chasm of that night.

I cannot permit that luxury now.

It took about three minutes to settle my things in the guest suite at the ANF laboratory. Then I went to the cafeteria, gulped down a sandwich and two cups of tea, and hurried back to Arthur's office. The grey file cabinet held twenty-seven ledgers; many more than I expected, since Arthur normally filled only two or three a year.

In front of the ledgers was a heavy packet wrapped in black plastic. I opened that first, and almost laughed aloud at the incongruity of the contents, side-by-side with Arthur's work records. He had enjoyed experimental science, but the idea of car or bicycle repair was totally repugnant to him. This packet held an array of screwdrivers, heavy steel wire, and needle-nosed and broad-nosed pliers, all shiny and brand-new.

I replaced the gleaming tool kit and turned to the ledgers. If they were equally out of character... It was tempting to begin with the records from the last few days of his life. I resisted that urge. One of the lessons that he had taught me in adolescence was an organized approach to problems, and now I

could not afford to miss anything even marginally significant to his death. The ledgers were neatly numbered in red ink on the top right-hand corner of the stiff cover, twenty-two through forty-eight. It was about six-thirty in the evening when I picked up Volume Twenty-two and

opened it to the first page.

That gave me my first surprise. I had expected to see only the notebooks for the four years that Arthur had been employed by ANF Gesellschaft. Instead, the date at the head of the first entry was early April, nine and a half years ago. This was a notebook from Arthur's final undergraduate year at Cambridge.

Why had he brought with him such old ledgers, rather than leaving them at his parents' house? The opening entry was unremarkable, and even familiar. At that time, as I well remembered, Arthur's obsession had been quantized theories of gravity. He was still coming to grips with the problem, and his note said nothing profound. I skimmed it and read on. Successive entries were strictly chronological.

Mixed in with mathematics, physics, and science references was everything else that had caught his fancy—scraps of quoted poetry (he was in a world-weary Housman phase), newspaper clippings, comments on the weather, lecture notes, cricket scores, and philosophical questions. It was hard to read at my usual speed. For one thing I had forgotten the near-illegible nature of Arthur's personal notes. I could follow everything, after so many years of practice, but Otto Braun must have had a terrible time. Despite his command of English, some of the terse technical notes and equations would be unintelligible to one of his background. Otto was an engineer. It would be astonishing if his knowledge extended to modern theoretical physics. And yet in some ways Otto Braun would have found the material easier going than I did. I could not make myself read fast, for the words of those old notebooks whispered in my brain like a strange echo of false memory. Arthur and I had been in the same place at the same time, experiencing similar events, and many of the things that he felt worth recording had made an equal impression on me. We had discussed many of them. This was my own Cambridge years, my own life, seen from a different vantage point and through a lens that imposed a subtle distortion on shapes and colors.

And then it changed. The divergence began.

It was in December, eight days before Christmas, that I caught a first hint of something different and repugnant. Immediately following a note on quantized red shifts came a small newspaper clipping. It appeared without comment, and it reported the arrest of a Manchester man for the torture, murder and dismemberment of his own twin daughters. He had told the police that the six-year-olds had "deserved all they got."

That was the first evidence of a dark obsession. In successive months and years, Arthur Shaw's ledgers told of his increasing preoccupation with death; and it was never the natural, near-friendly death of old age and a long, fulfilled life, but always the savage deaths of small children. Death unnatural, murder most foul. The clippings spoke of starvation, beating, mutilation, and torture. In every case Arthur had defined the source, without providing any other comment. He must have combed the newspapers in his search, for I, reading those same papers in those same editions, had not noticed the articles.

It got worse. Nine years ago it had been one clipping every few pages. By the time he went to live in

Bonn the stories of brutal death occupied more than half the journals, and his sources of material had become world-wide.

And yet the Arthur that I knew still existed. It was bewildering and frightening to recognize the cool, analytical voice of Arthur Shaw, interspersed with the bloody deeds of human monsters. The poetry quotes and the comments on the weather and current events were still there, but now they shared space with a catalog of unspeakable acts.

Four years ago, just before he came to Bonn, another change occurred. It was as though the author of the written entries had suddenly become aware of the thing that was making the newspaper clippings.

When Arthur discovered that the other side of him was there, he began to comment on the horror of the events that he was recording. He was shocked, revolted, and terrified by them. And yet the clippings continued, along with the lecture notes, the concerts attended, the careful record of letters written; and there were the first hints of something else, something that made me quiver.

I read on, to midnight and beyond until the night sky paled. Now at last I am permitted the statement denied to me earlier: The next morning I was still studying Arthur's notebooks.

Otto Braun came into the office, looked at me, and nodded grimly.

"I am sorry, Professor Turnbull. It seemed to me that nothing I could say would be the same as allowing you to read for yourself." He came across to the desk. "The security officer says you were up all night.

Have you eaten breakfast?"

I shook my head.

"I thought not." He looked at my hands, which were perceptibly shaking. "You must have rest."

"I can't sleep."

"You will. But first you need food. Come with me. I have arranged for us to have a private dining-room."

On the way to the guest quarters I went to the bathroom. I saw myself in the mirror there. No wonder

Otto Braun was worried. I looked terrible, pale and unshaven, with purple-black rings under my eyes.

In the cafeteria Braun loaded a tray with scrambled eggs, speckwurst, croissants and hot coffee, and led me to a nook off the main room. He watched like a worried parent to make sure that I was eating, before he would pour coffee for himself.

"Let me begin with the most important question," he said. "Are you convinced that Arthur Shaw took his own life?"

"I feel sure of it. He could not live with what one part of him was becoming. The final entry in his journal says as much. And it explains the way he chose to die."

Enough is enough

, Arthur had written.

I can't escape from myself. 'To cease upon the midnight with no pain.' Better to return to the womb, and never be born...

"He wanted peace, and to hide away from everything," I went on. "When you know that, the black plastic bag makes more sense."

"And you agree with my decision?" Braun's chubby face was anxious. "To keep the notebooks away from his parents."

"It was what he would have wanted. They were supposed to be destroyed, and one of his final entries proves it. He said, 'I have done one braver thing.'"

His brow wrinkled, and he put down his cup. "I saw that. But I did not understand it. He did not say what he had done."

"That's because it's part of a quotation, from a poem by John Donne. 'I have done one braver thing, Than all the worthies did, And yet a braver thence doth spring, And that, to keep it hid.' He wanted what he had been doing to remain secret. It was enormously important to him."

"That is a great relief. I hoped that it was so, but I could not be sure. Do you agree with me, we can now destroy those notebooks?"

I paused. "Maybe that is not the best answer. It will leave questions in the mind of Marion Shaw, because she is quite sure that the books must exist. Suppose that you turn them over to my custody? If I

tell Marion that I have them, and want to keep them as something of Arthur's, I'm sure she will

approve.

And of course I will never let her see them."

"Ah." Braun gave a gusty sigh of satisfaction. "That is a most excellent suggestion. Even now, I would feel uneasy about destroying them. I must admit, Professor Turnbull, that I had doubts as to my own wisdom when I agreed to allow you to come here and examine Dr. Shaw's writings. But everything has turned out for the best, has it not? Now, if you are not proposing to eat those eggs..."

Everything for the best, thought Otto Braun, and probably in the best of all possible worlds. We had made the decision. The rest was details. Over the next twelve hours, he and I wrote the script.

I would handle Marion and Roland Shaw. I was to confirm that Arthur's death had been suicide, while his mind was unbalanced by overwork. If they talked to Braun again about his earlier discomfort in

talking to them, it was because he felt he had failed them. He had not done enough to help, he would say, when Arthur so obviously needed him. (No lie there; that's exactly how Otto felt). And the journals? I would tell the Shaws of Arthur's final wish, that they be destroyed. Again, no lie; and

I would assure them that I would honor that intent.

I went home. I did it, exactly as we had planned. The only intolerable moment came when Marion Shaw put her arms around me, and actually thanked me for what I had done.

Because, of course, neither she nor Otto Braun nor anyone else in the world knew what I had done.

When I read the journals and saw Arthur's mind fluttering towards insanity, I was horrified. But it was not the revelation of madness that had left me the next morning white-faced and quivering. It was excitement derived from the other content of the ledgers, material interwoven with the cool comments on personal affairs and the blood-obsessed newspaper clippings.

Otto Braun, in his relief at seeing his own problems disappear, had grabbed at my explanation of

Arthur's final journal entries, without seeing that it was wholly illogical. 'I have done one braver thing,'

quoted Arthur. But that was surely not referring to the newspaper clippings and his own squalid obsessions. He was appalled by them, and said so. What was the 'brave thing' that he had done? I knew. It was in the notebooks.

For four years, since Arthur's departure from Cambridge, I had concentrated on the single problem of a unified theory of quantized spacetime. I made everything else in my life of secondary importance, working myself harder than ever before, to the absolute limit of my powers. At the back of my mind was always

Arthur's comment: this was the most important problem in modern physics.

It was the best work I had ever done. I suspect that it is easily the best work that I will ever do.

What I had not known, or even vaguely suspected, was that Arthur Shaw had begun to work on the same problem after he went to Bonn.

I found that out as I went through his work ledgers. How can I describe the feeling, when in the middle of the night in Arthur's old office I came across scribbled thoughts and conjectures that I had believed to belong in my head alone? They were mixed in hodge-podge with everything else, side-by-side with the soccer scores, the day's high temperature, and horror stories of child molestation, mutilation, and murder.

To Otto Braun or anyone else, those marginal scribbles would have been random nonsensical jottings.

But I recognized that integral, and that flux quantization condition, and that invariant.
How can I describe the feeling?

I cannot. But I am not the first to suffer it. Thomas Kydd and Ben Jonson must have been filled with the same awe in the 1590's, when Shakespeare carried the English language to undreamed-of heights.

Hofkapellmeister

Salieri knew it, to his despair, when Mozart and his God-touched work came on the scene at the court of Vienna. Edmund Halley surely felt it, sitting in Newton's rooms at Trinity College in 1684, and learning that the immortal Isaac had discovered laws and invented techniques that would make the whole System of the World calculable
; and old Legendre was overwhelmed by it, when the Disquisitiones came into his hands and he marvelled at the supernatural mathematical powers of the young Gauss.

When half-gods go, the gods arrive. I had struggled with the problem of spacetime quantization, as I

said, with every working neuron of my brain. Arthur Shaw went so far beyond me that it took all my intellect to mark his path. "It were all one that I should love a bright particular star, and think to wed it, he is so above me." But I could see what he was doing, and I recognized what I had long suspected. Arthur was something that I would never be. He was a true genius.

I am not a genius, but I am very talented. I could follow where I could not lead. From the hints, scribbled theorems, and conjectures in Arthur Shaw's notebooks I assembled the whole; not perhaps as the gorgeous tapestry of thought that Arthur had woven in his mind, but enough to make a complete theory with profound practical implications.

That grand design was the "braver thing" that he knew he had done, an intellectual feat that placed him with the immortals.

It was also, paradoxically, the cause of his death.

Some scientific developments are "in the air" at a particular moment; if one person does not propose them, another will. But other creative acts lie so far outside the mainstream of thought that they seem destined for a single individual. If Einstein had not created the general theory of relativity, it is quite likely that it would not exist today. Arthur Shaw knew what he had wrought. His approach was totally novel, and he was convinced that without his work an adequate theory might be centuries in the future.

I did not believe that; but I might have, if I had not been stumbling purblind along the same road. The important point, however, is that Arthur did believe it.

What should he do? He had made a wonderful discovery. But when he looked inside himself, he saw in that interior mirror only the glassy essence of the angry ape. He had in his grasp the wondrous spell that would send humanity to the stars—but he saw us as a bloody-handed, bloody-minded humanity, raging out of control through the universe.

His duty as he saw it was clear. He must do the braver thing, and destroy both his ideas and himself.

* * * *

What did I do?

I think it is obvious.

Arthur's work had always been marred by obscurity. Or rather, to be fair to him, in his mind the important thing was that he understand an idea, not that he be required to explain it to someone of lesser ability.

It took months of effort on my part to convert Arthur's awkward notation and sketchy proofs to a form that could withstand rigorous scrutiny. By that time, the work felt like my own; the re-creation of his half-stated thoughts was often indistinguishable from painful invention.

Finally I was ready to publish. By that time Arthur's ledgers had been, true to my promise, long-since destroyed, for whatever else happened in the world, I did not want Marion Shaw to see those notebooks or suspect anything of their contents.

I published. I could have submitted the work as the posthumous papers of Arthur Sandford Shaw ...

except that someone would certainly have asked to see the original material.

I published. I could have assigned joint authorship, as Shaw and Turnbull ... except that Arthur had never published a line on the subject, and the historians would have probed and probed to learn what his contribution had been.

I published—as Giles Turnbull. Three papers expounded what the world now knows as the Turnbull

Concession Theory. Arthur Shaw was not mentioned. It is not easy to justify that, even to myself. I clung to one thought: Arthur had wanted his ideas suppressed, but that was a consequence of his own state of mind. It was surely better to give the ideas to the world, and risk their abuse in human hands.

That

, I said to myself, was the braver thing.

I published. And because there were already eight papers of mine in the literature, exploring the same problem, acceptance of the new theory was quick, and my role in it was never in doubt.

Or almost never. In the past four years, at scattered meetings around the world, I have seen in perhaps half a dozen glances the cloaked hint of a question. The world of physics holds a handful of living giants.

They see each other clearly, towering above the rest of us, and when someone whom they have assessed as one of the pygmies shoots up to stand tall, not at their height but even well above them, there is at least a suspicion.

* * * *

There is a braver thing.

Last night I telephoned my father. He listened quietly to everything that I had to tell him, then he replied, "Of course I won't say a word about that to Marion Shaw. And neither will you." And at the end, he said what he had not said when the Nobel announcement was made: "I'm proud of you, Giles."

* * * *

At the cocktail party before tonight's dinner, one of the members of the Swedish Royal Academy of

Sciences was tactless enough to tell me that he and his colleagues found the speeches delivered by the

Nobel laureates uniformly boring. It's always the same, he said, all they ever do is recapitulate the reason that the award had been made to them in the first place.

I'm sure he is right. But perhaps tomorrow I can be an exception to that rule.