

## CHAPTER 1

# A FOOLISH CONSISTENCY

*Models that failed • Capitalism and the great financial crisis • Divining the future via models, theories, and intuition • Time causes desire • Disappointment is inevitable • To be disappointed requires time, desire, and a model • Living under apartheid • Growing up in “the movement” •*

*Tat tvam asi*

Pragmatism always beats principles. . . . Comedy is what you get when principles bump into reality.

—J. M. Coetzee, *Summertime*

## MODELS THAT FAILED I: ECONOMICS

“All that is solid melts into air, all that is holy is profaned, and man is at last compelled to face, with sober senses, his real conditions of life, and his relations with his kind,” wrote Marx and Engels in *The Communist Manifesto* in 1848. They were referring to modern capitalism, a way of life in which all the standards of the past are supposedly subservient to the goal of efficient, timely production.

With the phrase “melts into air” Marx and Engels were evoking sublimation, the chemists’ name for the process by which a solid transmutes directly into a gas without passing through an intermedi-

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ate liquid phase. They used sublimation as a metaphor to describe the way capitalism's endless urge for new sources of profits results in the destruction of traditional values. Solid-to-vapor is an apt summary of the evanescence of value, financial and ethical, that has taken place throughout the great and ongoing financial crisis that commenced in 2007.

The United States, the global evangelist for the benefits of creative destruction, has favored its own church. When governments of emerging markets complained that foreign investors were fearfully yanking capital from their markets during the Asian financial crisis of 1997, liberal democrats in the West told them that this was the way free markets worked. Now we prop up our own markets because it suits us to do so.

The great financial crisis has been marked by the failure of models both qualitative and quantitative. During the past two decades the United States has suffered the decline of manufacturing; the ballooning of the financial sector; that sector's capture of the regulatory system; ceaseless stimulus whenever the economy has wavered; taxpayer-funded bailouts of large capitalist corporations; crony capitalism; private profits and public losses; the redemption of the rich and powerful by the poor and weak; companies that shorted stock for a living being legally protected from the shorting of their own stock; compromised yet unpunished ratings agencies; government policies that tried to cure insolvency by branding it as illiquidity; and, on the quantitative side, the widespread use of obviously poor quantitative security valuation models for the purpose of marketing.

People and models and theories have been behaving badly, and there has been a frantic attempt to prevent loss, to restore the status quo ante at all costs.

## THEORIES, MODELS, AND INTUITION

For better or worse, humans worry about what's ahead. Deep inside, everyone recognizes that the purpose of building models and creating theories is divination: foretelling the future, and controlling it.

When I began to study physics at university and first experienced the joy and power of using my mind to understand matter, I was fatally attracted. I spent the first part of my professional life doing research in elementary particle physics, a field whose theories are capable of making predictions so accurate as to defy belief. I spent the second part as a professional analyst and participant in financial markets, a field in which sophisticated but often ill-founded models abound. And all the while I observed myself and the people around me and the assumptions we made in dealing with our lives.

What makes a model or theory good or bad? In physics it's fairly easy to tell the crackpots from the experts by the content of their writings, without having to know their academic pedigrees. In finance it's not easy at all. Sometimes it looks as though anything goes. Anyone who intends to rely on theories or models must first understand how they work and what their limits are. Yet few people have the practical experience to understand those limits or whence they originate. In the wake of the financial crisis naïve extremists want to do away with financial models completely, imagining that humans can proceed on purely empirical grounds. Conversely, naïve idealists pin their faith on the belief that somewhere just offstage there is a model that will capture the nuances of markets, a model that will do away with the need for common sense. The truth is somewhere in between.

In this book I will argue that there are three distinct ways of understanding the world: theories, models, and intuition. This book is

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about these modes and the distinctions and overlaps between them. Widespread shock at the failure of quantitative models in the mortgage crisis of 2007 results from a misunderstanding of the difference between models and theories. Though their syntax is often similar, their semantics is very different.

*Theories* are attempts to discover the principles that drive the world; they need confirmation, but no justification for their existence. Theories describe and deal with the world on its own terms and must stand on their own two feet. *Models* stand on someone else's feet. They are metaphors that compare the object of their attention to something else that it resembles. Resemblance is always partial, and so models necessarily simplify things and reduce the dimensions of the world. Models try to squeeze the blooming, buzzing confusion into a miniature Joseph Cornell box, and then, if it more or less fits, assume that the box is the world itself. In a nutshell, theories tell you what something is; models tell you merely what something is like.

*Intuition* is more comprehensive. It unifies the subject with the object, the understander with the understood, the archer with the bow. Intuition isn't easy to come by, but is the result of arduous struggle.

What can we reasonably expect from theories and models, and why? This book explains why some theories behave astonishingly well, while some models behave very badly, and it suggests methods for coping with this bad behavior.

### OF TIME AND DESIRE

In "Ducks' Ditty," the little song composed by Rat in Kenneth Grahame's *The Wind in the Willows*, Rat sings of the ducks' carefree pond life:

*Everyone for what he likes!*

*We like to be*

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*Heads down, tails up,  
Dabbling free!*

Doubtless the best way to live is in the present, head down and tail up, looking at what's right in front of you. Yet our nature is to desire, and then to plan to fulfill those desires. As long as we give in to the planning, we try to understand the world and its evolution by theories and models. If the world were stationary, if time didn't pass and nothing changed, there would be no desire and no need to plan. Theories and models are attempts to eliminate time and its consequences, to make the world invariant, so that present and future become one. We need models and theories because of time.

Like most people, when I was young I couldn't imagine that life wouldn't live up to my desires. Once, watching a TV dramatization of Chekhov's "Lady with a Lapdog," I was irritated at the obtuse ending. Why, if Dmitri Gurov and Anna Sergeyevna were so in love, didn't they simply divorce their spouses and go off with each other?

Years later I bought a copy of Schopenhauer's *Essays and Aphorisms*. There I read an eloquent description of time's weary way of dealing with human aspirations. In his 1850 essay "On the Suffering of the World" Schopenhauer wrote:

If two men who were friends in their youth meet again when they are old, after being separated for a life-time, the chief feeling they will have at the sight of each other will be one of complete disappointment at life as a whole, because their thoughts will be carried back to that earlier time when life seemed so fair as it lay spread out before them in the rosy light of dawn, promised so much—and then performed so little. This feeling will so completely predominate over every other that they will not even consider it necessary to give it words, but on either side it will be silently assumed, and form the ground-work of all they have to talk about.

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Schopenhauer believed that both mind and matter are manifestations of the Will, his name for the substance of which all things are made, that thing-in-itself whose blind and only desire is to endure. Both the world outside us and we ourselves are made of it. But though we experience other objects from the outside as mere matter, we experience ourselves from both outside and inside, as flesh *and* soul. In matter external to us, the Will manifests itself in resilience. In our own flesh, the Will subjects us to endless and unquenchable desires that, fulfilled or unfulfilled, inevitably lead to disappointments over time.

You can be disappointed only if you had hoped and desired. To have hoped means to have had preconceptions—models, in short—for how the world should evolve. To have had preconceptions means to have expected a particular future. To be disappointed therefore requires time, desire, and a model.

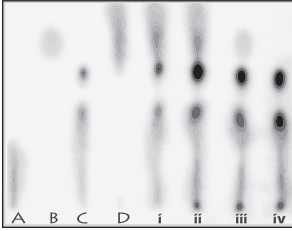
I want to begin by recounting my earliest experiences with models that disappoint.

### MODELS THAT FAILED II: POLITICS

I grew up in Cape Town, South Africa, in a society where most white people had Coloured servants, sometimes even several of them. Their maids or “boys” lived in miserably small rooms attached to the outside of the “master’s” house. Early in my childhood the Afrikaner Nationalist Party government that had just come to power passed the Prohibition of Mixed Marriages Act of 1949. The name speaks for itself. Next came the Immorality Act of 1950, which prohibited not just marriage but also adultery, attempted adultery, and other “immoral” acts between whites and blacks, thereby trying to deny, annul, or undo 300 years of the miscegenation that was flagrantly visible. In South Africa there were millions of “Cape Coloureds,”

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people of mixed European and African ancestry, who lived in the southern part of the country, their skin tone ranging from indistinguishable-from-white to indistinguishable-from-black and including everything in between.



In South Africa we all became expert at a social version of chromatography, a technique chemists use to separate the colors within a mixture. I learned how to do it in my freshman chemistry course at the University of Cape Town. You place a drop of black ink on a strip of blotting paper and then dip the end of the strip into water. As the water seeps through the paper, it transports each of the different dyes that compose black through a different distance, and, as if by magic, you can see the colors separate. How convenient it would have been for the government to put each person into a device that could have reported his or her racial composition scientifically. But the authorities came as close to that as they could: the Population Registration Act of 1950 created a catalogue in which every individual's race was recorded. South Africa didn't just categorize people into simple black and white; there were whites, natives (blacks), Coloureds, and Indians. Racial classification was a tortuous attempt to impose a flawed model on unruly reality:

A white person is one who in appearance is, or who is generally accepted as, a white person, but does not include a person who, although in appearance obviously a white person, is generally accepted as a Coloured person.

A native is a person who is in fact or is generally accepted as a member of any aboriginal race or tribe of Africa.

A Coloured person is a person who is not a white person nor a native.

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Note the pragmatic combination of objectivity and subjectivity: if you are objectively white but accepted as Coloured, then you're not white.

In disputed cases a board made decisions that determined not only who you could sleep with but which beaches you could swim at, where you could work and live, which buses you could take, and which cinemas you could attend. Given South Africa's history of miscegenation, it was not uncommon for members of the same family to end up with different chromatography profiles. Some Coloureds attempted to be reclassified as white, and some blacks applied to be reclassified as Coloured. Evidence involved keen discussions of texture of bodily hair, nose shape, diet, and ways of earning a living, the latter two being taken as racial characteristics rather than matters of socialization or opportunity. Most Chinese, who were difficult for officials to define or even to distinguish from other Asians, were classified as nonwhite, but Chinese from Taiwan and all Japanese, for trade and economic reasons, were declared honorary whites.

The Group Areas Act of 1950 institutionalized apartheid by specifying the regions in which each race could live and do business. Nonwhites were forcibly removed from living in the "wrong" areas, thereby superimposing a legal separation over the less formal physical separation of the races that had already existed.<sup>1</sup> Those domestics who didn't "live in" had to commute long distances to work. In Cape Town the government razed District 6, its Coloured Harlem, and moved the entire community of inhabitants to the Cape Flats, a desolate sandy region outside the city, well described by its name. When I was at university I trekked out there several times as a volunteer on behalf of the Cape Flats Development Association to help persuade poor Coloured families to feed their children milk rather than the cheaper mashed-up squash that, though stomach-filling, had virtually no nutritional value. It was a bleak area with sparse vegetation and no running water, a gulag whose inhabitants lived in makeshift

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shanties constructed of corrugated iron, plywood, and cardboard. Barefoot children were everywhere. Many parts of South Africa are still like that, despite the end of apartheid.

By 1951 nonwhites were being stripped of whatever voting rights they had possessed. Though I knew all this was wrong, I grew up with it as normality. The air you breathe, once you grow accustomed to it, has no smell at all.<sup>2</sup>

When I was ten years old our neighbor down the block, a Jewish businessman in his forties with two sons a little older than I, was found on the floor of his downtown office in flagrante delicto with a young black girl. His doctor testified that he had prescribed pills for our neighbor's heart condition that might have had aphrodisiac side effects. The black girl apparently didn't need pills to provoke her desire, and I don't recall what sentence, if any, either of them received.

Several years later an acquaintance of my sister's was arrested. The police had seen him driving in his car at night with a Coloured woman seated beside him. They trailed him to his house, watched through the window, and later testified to observing the sexual act. His stained underwear was presented in court as evidence. The initial giveaway was the fact that the woman sat in the front seat, beside him. White men who gave their maids a ride somewhere commonly made them sit in the backseat to avoid suspicion.

But even white women (the "madams") often made their maids sit in the backseat. The unarticulated aim was the avoidance of even innocuous physical intimacy. (Of course, if it had to be avoided, it wasn't innocuous.) A native's lack of whiteness made him or her untouchable. To avoid contamination, white families often had two sets of knives, forks, and plates: one for the family to use and one for their maids and "boys." When I read *Portnoy's Complaint* in 1969, a few years after I arrived in New York, the following passage reminded me of the visceral sense of defilement that many South African whites had been taught to feel:

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Once Dorothy chanced to come back into the kitchen while my mother was still standing over the faucet marked H, sending torrents down upon the knife and fork that had passed between the schvartze's thick pink lips. "Oh, you know how hard it is to get mayonnaise off silverware these days, Dorothy," says my nimble-minded mother—and thus, she tells me later, by her quick thinking has managed to spare the colored woman's feelings.

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The Nationalist Party government that came to power in 1948 hated and feared Communism, not because the Nationalists were lovers of the individual freedom threatened by totalitarianism, but because they were totalitarian themselves. They denounced "radicals," but as a student leader at a University of Cape Town rally once pointed out to great applause, it was the Nationalists who were the true radicals, intent on wiping out age-old conservative democratic principles. Their government periodically declared a state of emergency, which allowed for arbitrary detention. They put opponents and suspects in jail without trial for 180 days, renewable. Eventually they banned the Communist Party. Then they proceeded to ban the more gentlemanly Liberal Party, whose slogan was "One man, one vote." Fearful people made an effort to say they were "liberal with a small l."

When I was seventeen and spending the summer working and touring in Israel, I bought a copy of *Atlas Shrugged* and hid it in my luggage on my return, successfully slipping it through Customs like a copy of *Playboy* or *Tropic of Cancer*. The South African prism had shifted the political spectrum so far to the dictatorial right that Ayn Rand's defense of the individual and of libertarian capitalism seemed to me and my friends to be subversive. At the extremes, left could not be distinguished from right. I thought of this later, when I first learned the theory of complex numbers: in the complex plane, the points at plus and minus infinity coincide, and again far left and far right become indistinguishable.

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South Africa's models were rife with internal contradictions. The most severe was the government's policy of race separation that pretended to grant blacks independence in their supposed homelands while still keeping them available to provide the labor that kept the country running. There were smaller hypocrisies too. As young white teenagers in the 1950s, we spent the entire summer in the sun on Fourth Beach at Clifton or in the crowded Snake Pit at Muizenberg, applying fish oil or Skol so as to get as dark as possible.<sup>3</sup> A girl I knew who devoted her time to acquiring a magnificent tan grew indignant when the train conductor mistook her for a Coloured and instructed her to go to the train carriage reserved for that race.

Coloureds were treated better than natives but much worse than whites. Their facilities weren't separate but equal; they were vastly inferior or nonexistent. In downtown Cape Town, where I worked in a department store one summer in the early 1960s, I don't think there was a single restaurant a black person could enter to sit down and eat. All the salesladies behind the counter, even in down-market OK Bazaars, were white.

From birth I knew no other society, and though I knew apartheid was wrong, individual blacks were pretty much invisible to me. Once, soon after I learned to drive, I took my parents' car to the garage to get petrol. In those distant days of luxury all garages were full service, and the "boys" bustled around your car when you drove up. They pumped petrol; checked the oil, water, battery, and brake and clutch fluids; cleaned the windows; and measured the tires' pressure and put in air if necessary. When you left, you tipped the attendant who had served you. That day, my nervous first time dealing with a garage on my own, there were three or four attendants hovering around the several cars at the petrol pumps, and as I drove away I realized with minor horror that I had mistakenly tipped the wrong man. When you weren't used to seeing blacks as individuals, they truly did all look the same.

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Enforced racial separation hadn't always been the norm. I spent my first seven years in Salt River, a poor mixed-race suburb that was home to many immigrant Jews who hadn't yet made it. (I remember fondly Mr. Jenkins, our Coloured plumber, who lived in the neighborhood. He spoke Yiddish, and once, when he arrived at our front door while I was in bed with a bad cold, I fearfully mistook his voice and intonation for that of our doctor, who also made home visits.) Apartheid as a legal policy reached peak efficiency only in the late 1950s and 1960s, my formative years, when I became accustomed to racism. My sisters, 9 and 12 years older than I, grew up in a less formally prejudicial world and were less racist than I was. My nephews and nieces, 16 or more years younger, grew up as the apartheid regime was collapsing, and it left a milder indentation on them.

It was only when I left to study in New York in the late 1960s that I had the chance to socialize informally with people that South Africa classified as nonwhites. One day, kidding around physically with some Indian friends in the common room of the graduate student dormitory where we all lived, I suddenly realized that I was doing what I'd never done before, and was grateful for it.

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When I was ten I spent the winter vacation with my parents about 100 miles northeast of Cape Town, in Montagu, a small town reached by steep switchbacks that crossed a deep ravine called DuToit's Kloof. Founded by British settlers in the mid-1800s, Montagu was a faded winter retreat, a Jewish immigrant's colonial-style Bath or Évian, but with a local population of Coloureds and Afrikaners. The town's main attraction was a nearby thermal spring that was reputedly good for arthritis. The refined hotel on the main street was called The Avalon. We stayed in The Baths, set in the countryside a few miles out of town. The Baths was fun but run-down. There was one toilet and bathroom at the end of each wing, and because it was a long, cold walk down the outdoor passage that connected the rooms, there was

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a heavy white enamel chamber pot beneath your bed in case you needed to urinate during the night. The Coloured maids emptied it in the morning, when they made up the room.

Baboons roamed the small kloof that separated The Baths from the business center of tiny Montagu. Sometimes they came onto the hotel grounds, emptying trash cans and even entering rooms. An older boy I knew climbed the hills above the hotel to shoot the baboons with an air gun, which I coveted.

The adults used to take a constitutional every morning, hiking into town through the kloof to The Avalon, to take tea and Scottish scones with local strawberry jam, butter, and thick whipped cream, but we children stuck to the grounds of The Baths, furiously socializing. My father babied me whenever I allowed him to and embarrassed me by forcing apples on me while I was with my friends. I fell in love with a twelve-year-old girl who scorned me, thanks to my father's constant attention. It was in Montagu that someone, I don't recall who, explained to me where babies come from. And it was in Montagu a few years later that I briefly met Adrian Leftwich.

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Each year seasonal crazes swept through our school. One month it was silkworms that we bought and collected, keeping them in shoeboxes with airholes and feeding them mulberry or cabbage leaves until they grew into fabric-wrapped armatures. A season later came marbles. And then, outdoing all previous crazes, came hypnosis.

The sovereign of hypnosis in Cape Town was Max Collie, a professional entertainment hypnotist who had emigrated to South Africa from Scotland. His son and I went to the same school. Every year or so Mr. Collie did a couple of shows in Cape Town, some of them on our school's premises. He began by testing the audience for suggestibility, attempting to talk their outstretched right arms into floating up into the air while their eyes were closed.<sup>4</sup> "Your arm wants to rise up into the air. It feels light, like a balloon, so light it wants to float up

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towards the ceiling. Don't resist, let it go, let it go." Occasionally some hypersuggestible soul whose arm had spontaneously risen up would already be in a trance as a result of the test, and would fail to open his eyes at its conclusion, even before he had been officially hypnotized. Those suggestibles who were uninhibited enough to agree to participate in the show then went onstage to be hypnotized in front of the entire audience, including their own children. Soon adult men and women were under Mr. Collié's command, shyly attending their first day at school, asking the teacher for permission to go to the wash-room, scratching as though there were itching powder in their clothes, lying rigidly across two separated chairs. Finally, there was the post-hypnotic suggestion: "When you wake up and are back in the audience, whenever you hear me say 'It is very warm in here tonight,' you will feel as though you are sitting on a hot electric plate and jump up screaming." Then he woke them: "As I count backwards from ten to one, you will slowly start to feel wider and wider awake. Ten, nine, eight . . . you feel light and cheerful, your eyes are beginning to open . . . seven, six, five, four . . . you are almost ready to wake up, you feel very good and full of energy . . . three, two, one, wake up! Thank you very much, ladies and gentlemen."



It was awe-inspiring to see people under Max Collié's power, and soon we were all trying to hypnotize each other. I bought books on hypnosis and self-hypnosis written by the aptly named Melvin Powers. The covers had mesmerizing diagrams of vertigo-inducing centripetal spirals, and some of the books included "the amazing hypnodisk," which you could use to hypnotize yourself and your friends. My cousin and I spent hours trying to put each other under.<sup>5</sup>

In Montagu that winter of the hypnosis craze I first met the equally aptly named Adrian Leftwich, several years older than the rest of us and not really a part of our more childish circle. I didn't see him

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again until a few years later, in the early 1960s, when I went to the University of Cape Town. By then Leftwich was the charismatic head of the National Union of South African Students, or Nusas, a principled anti-apartheid group. He was one in a series of Nusas student leaders who were in outspoken opposition to the government, and I admired his leadership and courage. And it truly did take courage: many student leaders of Nusas, like other foes of apartheid whom the government despised and even feared, were frequently arrested and eventually “banned,” legally forbidden to attend any public meetings or even go to the cinema or theater. A more extreme punishment was house arrest. Most of the banned had had their passports revoked, so if they chose to leave the country they had to do so on a one-time permit into permanent exile. Anti-apartheid rallies were monitored by policemen and plainclothes agents of the Special Branch, who took photographs, and even those who merely signed anti-apartheid petitions worried about getting their names on a blacklist.

As the government clamped down on all forms of legal protest, violent opposition emerged. In 1963 there were sabotage attacks on power pylons and FM transmitters in the vicinity of Cape Town. In 1964 the security police carried out nighttime searches of the houses of known anti-apartheid activists, Leftwich among them. They found him in bed with his girlfriend, his flat carelessly filled with detailed plans that incriminated him as the hitherto anonymous leader of the African Resistance Movement, which had taken responsibility for the sabotage. The police arrested Leftwich and kept him in solitary confinement. Perhaps fearful of being sentenced to death, he quickly turned state’s evidence and, in his own words in a later written reminiscence, “named the names” of his collaborators and recruits and gave testimony for the prosecution at their trial. I attended court on the day of the sentencing, where the presiding judge said that to call Leftwich a rat would be an insult to the genus *Rattus*.

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I never had much political courage and had admired Leftwich for his bravery as head of Nusas. I don't judge him now. Like most of us, he wasn't what he thought he was. But thankfully, for most of us, comprehension of the disparity between who we think we are and who we truly are comes gradually and with age. We are lucky to avoid a sudden tear in our self-image and suffer more easily its slow degradation. For Leftwich the apparent union between personality and character ruptured like the fuselage of the early De Havilland Comet, in an instant, in midair, unable to withstand the mismatch between external and internal pressure. How do you ever forgive yourself for a betrayal like that?

But we have all committed acts that surprise us and are hard to forgive. You can count yourself lucky if your model of yourself survives its collision with time.

### **MODELS THAT FAILED III: THE MOVEMENT**

I was the accidentally conceived last child of Jewish parents who emigrated from Poland (now Belarus) to Cape Town in the mid-1930s to get away from what they saw as the anti-Semitic Poles. My parents' departure from Poland turned out to be a fortuitous escape from the concentration camps, but my maternal grandparents and many of the uncles and aunts I never knew stayed behind and weren't as fortunate. Had my mother been certain her father was dead by 1945, I would have been named Nahum Zvi. Sixteen years later, in Jewish tradition, my nephew was given his name.

When I was four years old, in late 1949, our family took a six-week trip to Israel. My mother hadn't seen her only two surviving sisters and one brother since 1935, when she had embarked for South Africa and they had emigrated to Palestine. We took a propeller-driven DC Skymaster from Cape Town to Lydda Airport in Israel, stopping in

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Johannesburg, Nairobi, Entebbe, Juba, Khartoum, Wadi Halfa, Cyprus, and several other places I don't now recall. An enormously fat man on our plane had a heart attack after eating some pickled meat somewhere over the Sudan. Officials met us on the tarmac when we next touched down, escorted us into the shade of a shack, and took him away. We had left summer behind in Cape Town; in Israel it was the now famously cold winter of 1949–1950. It snowed in Tel Aviv that year—it hasn't happened since—and unprepared for the severity of the cold, we wore pajamas underneath our clothes all day long. It was the aftermath of the Israeli War of Independence, and food was being rationed. I recall going with my aunt to the coupon bureau, where she pleaded for an extra banana for me. I remember everything quite vividly, the rooster-shaped red lollipops they sold in the stores, the corn on the cob scooped out of steaming pots by street vendors, the grapefruit my sister and cousin and I stole off the trees of an orchard. I remember too the blood-red eyeballs of my little Israeli cousin, two years old, whose perambulator had been struck by a runaway truck.

One afternoon some friends of my parents took us for a sight-seeing drive. Somewhere along the way I heard one of them point out a nearby building to my father and remark that it was a jail.

“But why is there a jail here?” I asked. “Isn't everyone Jewish?”

The adults chuckled. It must have embarrassed me because I remember it after almost 60 years. My mental model of Jews, formed by conversations at home, didn't contain scenarios in which we committed crimes.

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In my 1950s childhood South African Jewish adults were mostly immigrants, a zeroth generation with heavy, embarrassing foreign accents. They had begun their new lives in the poorer mixed-race suburbs and worked hard in small businesses. My father, who arrived in 1934, soon began running Union Service Station, a garage that

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sold petrol, oil, and batteries, as well as secondhand axle-and-wheel sets for the donkey carts that many peddlers still used. He was ambitious and inventive. During the Second World War there was a shortage of imported car batteries in South Africa, and so he set about learning how to manufacture batteries in a room behind his garage. He obtained molds, melted down solid lead, and cast his own thin flat plates, then immersed them inside black Bakelite battery casings containing a solution of dilute sulfuric acid. These he sold under his own brand with his own warranty. I recall the plates clearly, each a silvery grille you could see through, the glossy lead perforated so as to increase the surface area in contact with the acid. In those days batteries were unsealed, and the garage attendants who filled your gas tank would unscrew the battery tops, check the acid concentration with a glass hydrometer, and then top it up as necessary. I have a clear picture of my father's white lab coat riddled with the brown-edged holes of acid burns. Later, when I studied chemistry in high school, he told me that the correct method of dilution was to pour concentrated acid into water rather than water into concentrated acid, a water splash-back being infinitely preferable to an acid one.

Some of my parents' friends had been in concentration camps and bore the proof of it on their arms. The wife of my bar mitzvah teacher had had her tattoo surgically removed, and you could see the skin discoloration that resulted. Her husband kept his number. Most people I knew had lost close relatives in the Holocaust. Just about everyone was a Zionist, and almost all of these people had relatives who had emigrated to Palestine from Europe. I remember what must have been the 1948 Cape Town celebrations accompanying the establishment of the state of Israel. My Israeli cousin who lived with us for a year lifted me up onto a festive float that was part of an Independence Day parade at the Rosebank fairgrounds. I can still feel her hands in my armpits as she raised me.

I grew up in what amounted to a voluntary Jewish ghetto. Tradi-

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tionally, Jewish kids in the Diaspora attended daily secular schools and then, several times a week, went to a cheder for late-afternoon Hebrew and Jewish studies. My parents sent me instead to the recently founded Herzlia Day School, a full-time school that combined both a secular and a Jewish education under the same roof. The school was named after Theodor Herzl, the worldly Viennese Jewish journalist who organized the first Zionist Congress in Basel and proposed the creation of a Jewish state 50 years before it finally came into existence in 1948. Our school's motto was from Herzl: "If you will it, it is no legend." In addition to learning Jewish history and reading parts of the Bible in classic Hebrew, we learned to speak, read, and write modern Hebrew, expertly taught by a series of visiting teachers from Israel who rotated through South Africa for a few years at a time.

Though most of our parents adopted the Zionist model, their Zionism came in various political flavors. My parents and many of their friends belonged to Poalei Zion (Workers of Zion), also called the Zionist Socialist Party, which supported David Ben-Gurion and his political Labor movement in Israel in the 1950s. Parents of other friends were Revisionists, so named by Ze'ev Jabotinsky in the 1920s, when he invented his own brand of right-wing Zionism. The Revisionists' slogan, which I heard often, was "A Jewish state with a Jewish majority on both sides of the Jordan," a view that seemed pointless and funny to me in the 1950s and early 1960s, but became much less so after the Six Day War of 1967. The Revisionists were affiliated with the right-wing Herut (Freedom) Party in Israel, led by Menachem Begin, who, before Israeli independence, had led Jewish terrorists against the British colonizers of Palestine. According to my mother, Begin had dated her sister, one of my Israeli aunts, back in Poland when they were both young.

"Socialist" taken seriously would have been a loaded adjective in apartheid-era South Africa. The Cape Town Zionist Socialists were

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not really Socialist at all; they were not putting themselves on the front line for justice and equality in South Africa. They were petit bourgeois businessmen and their wives, political and intellectual descendants of the prewar *echt* European Zionist Socialists.<sup>6</sup> They held evening teas or fund-raisers once a month in someone's living room, where they all addressed each other as *Chaver* (Comrade). Sitting upstairs in my bedroom while they held a meeting in our living room, my teenage friends and I chuckled condescendingly to hear them call my businessman father "Chaver Derman." We referred to the whole bunch of them half-affectionately, half-mockingly as the *chaverim*.

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But from age eight to nineteen or twenty I was a junior *chaver* myself. I belonged to Habonim (the Builders), a coeducational Zionist youth movement. Habonim was Lord Baden-Powell's colonial Boy Scouts with the Mowgli mythology replaced by an evangelical pioneering leftish political Zionism, overlaid with the back-to-nature romanticism of the German *Wandervögel* movement of the early twentieth century. The organization was founded in 1929 in England, whence it spread rapidly around the world. We called it "the movement," and it now seems remarkable to me that we let so politically ambitious a phrase fall so easily from our lips.

The movement's aim was that its members fulfill *chalutzik aliyah*. The Hebrew word *aliyah* means "ascension," a metaphorical expression for going to live in Israel, a spiritually higher place. *Aliyah* is also the religious term for ascending to the *bimah*, the platform in the center of the synagogue from which one reads directly from the Torah on Saturday morning, a privilege given to seven people each week. *Chalutzik* is a bastardized adjectival form of *chalutz*, a "pioneer." *Chalutzik aliyah* therefore means a pioneering emigration to Israel. Pioneers set out into new territory to prepare the way for others to follow, which is indeed what the early Jewish immigrants from

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Europe to Palestine did in the late 1800s. The movement wanted us to do the same: go to Israel and live on a kibbutz in a communal Socialist framework.

Habonim was merely one of five Jewish youth movements in the Diaspora in general, and in South Africa in particular. Similar to Habonim, but more left and therefore smaller, was Bnei Zion (Sons of Zion). The two groups eventually merged. Even more admirably and rigorously left was Hashomer Hatzair (The Youthful Guard), founded in Galicia in 1913, another movement in the communal Socialist mold but much more severe and radical than Habonim. On the right of Habonim was reactionary Betar, its name an acronym for Brit Yosef Trumpeldor (the Covenant of Joseph Trumpeldor). Trumpeldor, we learned at Herzlia High School, was a one-armed Jewish hero who fell fighting the Arabs in the battle of Tel Hai in Palestine in 1920, exclaiming as he died, "It is good to die for one's country." Just as Habonim was the youth movement allied to Ben-Gurion's Israeli Labor Party, so Betar, founded by Ze'ev Jabotinsky in Riga, Latvia, in the 1920s, was the youth wing of Begin's Herut. Orthogonal to the entire left-to-right political spectrum was Bnei Akiva (Sons of Akiva), a Zionist youth movement whose members were religiously observant, named in honor of the Jewish martyr Rabbi Akiva.

Habonim was highly structured and, most impressively, run entirely by boys and girls in their late teens. There must have been several thousand members countrywide, divided into three age groups: eight- to twelve-year-olds were called Shtilim (saplings); thirteen- to sixteen-year-olds belonged to Bonim (builders); and those sixteen and older were called Shomrim (guards) and administered and headed the movement. They organized the business side of it, coordinated weekly group meetings, planned winter and summer camps, arranged educational trips to Israel to work on kibbutzim, held annual youth congresses, and more, with virtually no adult help. The movement held weekly group meetings for kids in each suburb

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that had enough attendees to support one. Each group was run by an older teenage *madrich* (guide) or *madricha* (the feminine version).

Some more idealistic members would spend a year or two working full-time for the movement, on salary, in our downtown office. “I’m going to Office,” someone might remark when he or she went in to do some work, as though there were only one office in the entire universe. Office was also a good place to socialize. We typed articles and manifestos on waxed stencils and printed copies of songbooks, syllabi, and literary magazines on rotary Gestetner machines.

I was deeply involved in Habonim for my entire life in South Africa. As a child I attended Sunday morning meetings of our local Shtilim group, where I learned classic Boy Scout British Empire skills: tying knots, pitching tents, making fires, building camp furniture out of felled saplings lashed together with string and rope, signaling with semaphore flags. We learned Jewish songs and Jewish history and Israeli geography. We attended outdoor camps for three weeks in the summer and indoor seminars in old up-country hotels for ten days in the winter, drinking hot cocoa boiled in a cauldron and singing around the campfire. We were not so subtly indoctrinated with a go-to-Israel-when-you-grow-up theme, a message that became more explicit as I moved into the group of twelve- to sixteen-year-olds. After that, if you still belonged to the movement and hadn’t totally succumbed to the obligations of study, the challenge of South African politics, and the attractions of serial dating, you became a member of the highest age group, the Shomrim. That’s the route I took.

Just as the Boy Scouts had Mowgli-related archetypes for elements of its framework, so Habonim had its own Hebrew pioneer words for everything official and ideological. The movement’s motto was *Aleh U’vneh*, “Go up and build,” and the appropriate response was *Aloh Na’aleh*, “We will indeed go up.” The first line of the movement’s archaic-sounding song was “Habonim, strong builders, we lads have become,” the lads being a nice Scottish Jewish touch.<sup>7</sup> I recall a

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couplet somewhere in the song that went “We pause not for laggards but build, brick by brick, / A mighty foundation with shovel and pick.” Being mostly normal lads and lassies despite all of the ideology, we invariably sang the last phrase as “shovel and prick.”

Like middle-class adolescents everywhere, in the final years of high school we concentrated on studies, social life, dances, and the opposite sex. We went to birthday parties, invited dates to see Doris Day and Rock Hudson in *Pillow Talk*, took dancing lessons at Arthur Murray to prepare for school dances (as we called our proms), quick-stepped to “It Happened in Monterey,” and rock-and-rolled to “A Taste of Honey.” British-style, we decided at age seventeen what we (thought we) would do for the rest of our lives and then applied to university to do it. Mostly male would-be doctors went directly from high school to medical school, at age eighteen or nineteen dissecting corpses and examining the insides of women. Regular kids after graduating from high school ignored idealism and proceeded to adulthood along conventional routes; the more politically conscious worked against apartheid. My friends and I, though we participated in many activities outside Habonim, remained in the movement.

Our reasons were many. Some small number of us were truly Zionists, intent on going to Israel. An even smaller subset were Zionist and Socialist, intending to live on a kibbutz. A substantial fraction of the rest of us, socially immature and uncomfortable with the complexities of late adolescence, sought, in the warm womb of the movement, sublimation and a respite from the stresses of social life. The benefits were twofold: we gained shelter from dating and from the perilous thrills of sexual experimentation, and we avoided having to take a stand in an unjust South Africa.

The sexual revolution came to white South Africa later than Philip Larkin’s *annus mirabilis* of 1963, and to the members of Habonim perhaps a little later still. I don’t mean to say that no one was interested in sex, but Habonim mores were tinged with a left-wing puri-

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tanical morality that developed in the 1940s and persisted through the mid-1960s, at which time I finally left South Africa for the United States. There wasn't much one-on-one dating, which was vaguely discouraged; social life was focused on groups, though some couples did form within them.

But somewhere inside us we scorned what we thought of as bourgeois pursuits. We were taught *Wandervögelish* slogans and principles from the 1930s or earlier. "A member of Habonim is close to nature and simple in his ways" was one of the more memorable ones. There was an unwritten prejudice against makeup for girls; it wasn't natural. We sanctimoniously looked down on normal interests and ambitions. The movement's highest aspiration was to upend the traditionally Jewish social structure of labor, which, we were taught, was an unfortunate inverted triangle, its top disproportionately heavy with professionals and brain workers and its bottom too light with the agricultural and manual laborers that should have provided a stable societal base. There should be more workers and fewer *luftmenschen*, said the *luftmenschen*. Labor was noble. The best thing you could do was emigrate to Israel, live on a kibbutz, and earn your keep by manual labor in a communal setting. Some young men of my generation chose to become fitters and turners or plumbers rather than go to university. For several years the movement ran a *hachsharah* (preparation camp), a communal kibbutz-style farm in South Africa where you could live and learn agricultural skills in order to prepare for kibbutz life in Israel. We debated the merits of bringing up children in a unit separate from their parents, as happened on some kibbutzim. It was all serious, admirable stuff. While we sublimated we debated ideology, and it *was* stimulating.

*Chalutzik aliyah* wasn't as unreasonable as it may sound now, 50 years later; hundreds of Habonim members eventually emigrated to Israel, and many went to live on a kibbutz. We were living shortly after the Germans had exterminated six million Jews who didn't have

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a homeland. Furthermore, Jews were disproportionately prominent and active as white foes of the Afrikaner government, some of whose leaders had been pro-German during World War II. As a result it wasn't illogical to think about leaving South Africa, a racist country apparently destined to undergo a bloody final act to its drama of white domination. Trying to sidestep the next Holocaust was a logical move, especially if you had escaped the previous one. As for Socialism, it sounded fair and attractive.

For me this cloistered and romantic haven came to a crisis during my final years at university. Since high school my social life had revolved largely around Habonim. In 1962–1963, when I was seventeen, I spent six weeks touring Israel on an educational program, having fun while learning Zionist ideology and working on Kibbutz Yizre'el in the Galilee, where many of the members were South African. I spent winter and summer vacations working so hard and so happily as a *madrich* that I was too pleasantly exhausted to ponder personal problems. The years flew by; weekends involved Friday night discussions among contemporaries, Saturday night folk dancing and parties with our own entertainment and skits, Sunday mornings or evenings running a weekly meeting for a group of younger kids. Late at night we went to drive-in restaurants for toasted cheeses, chips, and milk shakes and sat in cars talking about intellectual stuff, morality, and girls. It was fun.

And yet I wasn't at all sure that I wanted to emigrate to Israel, and I certainly didn't want to give up studying physics in order to live on a kibbutz. The leaders of the movement, though, had no doubt about what was right. They instituted an *aliyah* register, an oath you had to sign in order to continue to be a member of the movement, your signature certifying that you intended to fulfill *chalutzik aliyah* or, failing that, at least some kind of bourgeois *aliyah*. They argued with members who wouldn't sign it, scorned those who didn't agree with them, were willing to shame them. Late one night, as we sat in a car,

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a male friend of mine couldn't hold back a burst of frustrated tears after being humiliated by their confident judgments.

"Give me a girl at an impressionable age and she is mine for life."<sup>8</sup> I wouldn't be writing about the movement now if it hadn't left its marks on me, many of them good. But I took all the moral issues seriously, and I very much resented being judged. So somewhere around the age of nineteen, a little bitter, I departed the movement, opening up a deep hole in my social life. What bothered me most was the self-righteous, I-know-what-you-should-do attitude of the few people at the head of Habonim. They were scornful of people with different aspirations, accusing them of wrong thinking or hypocrisy; they were certain of the future and the justness of their arguments, sufficiently so to humble anyone who didn't think their way.

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Ten years later I had completed a PhD in the United States and was now a postdoc at Oxford University. I reconnected with some old South African Habonim friends in London. My plumber friend who had indeed gone to a kibbutz had shortly thereafter abandoned both kibbutz and Israel in order to marry a woman who wanted to live in London. The head of the movement had left the kibbutz too and was also in London, working on a PhD in sociology. None of them seemed to have any compunction about having changed their minds.

## A LOOK AHEAD

Though we tend to rely on them, models fail and theories are almost never perfect. This book is therefore about models and theories: their nature, what to expect of them, how to differentiate between them, and how to cope with their inadequacies. Chapter 2, "Metaphors, Models, and Theories," introduces and analyzes two ways of understanding the functioning of the world. As mentioned at the start of the present

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chapter, models, like metaphors, tell us merely what something is *like*; theories, in contrast, attempt to tell us what something actually *is*.

Chapter 3, “The Absolute,” focuses on the nature of theories, which I illustrate by using Baruch Spinoza’s analysis of human passions and the pain they bring. The work of Spinoza, a seventeenth-century philosopher, bears a close relationship to geometry and to the twentieth-century theory of financial derivatives.

Chapter 4, “The Sublime,” recounts the development of the most accurate theory in physics: the theory of the electromagnetic field. I show that intuition plays a major role in the discovery of nature’s truths.

Chapter 5, “The Inadequate,” returns to models, in particular the Efficient Market Model of finance, which has been cited as one of the causes of the financial crisis. I analyze the metaphorical nature of the model’s assumptions and point to the places where they fall short. Theories can sometimes be perfect, but models are always inadequate, and financial models especially so.

Chapter 6, “Breaking the Cycle,” suggests ways to cope with the shortcomings of models. To work around their inevitable flaws requires a clear understanding of their precepts; it also requires common sense and, especially, ethical principles. I have reprinted a part of *The Financial Modelers’ Manifesto*, developed several years ago with a colleague, which proposes a set of principles for financial analysts to live by. An Appendix, “Escaping Bondage,” provides a short diagrammatic summary of how Spinoza’s theory of the emotions leads to his philosophy for escaping the painful confines of the passions.

## TWO IMPOSSIBLE THINGS BEFORE BREAKFAST

The longer you live, the more you become aware of life’s contradictions and of the inability of reason to reconcile them. A therapist

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friend told me that when she treats patients who radiate negative energy she places 10 cc of water in a glass between her and them in order to protect herself. The physical nature of water molecules, she explained, allows them to absorb negative energy. When her patient leaves, she flushes the water down the toilet. It's an appealing notion, albeit an entirely fanciful one, in my opinion. But my friend believes it's genuine physics and recommended the same strategy to me.

I have a hard time being patient when people confuse metaphor with fact. How do you respond to someone who sincerely believes what she says, and who is trying to help you, but who can't see the boundary between reality and fiction?

In Nabokov's *Lolita*, Humbert Humbert violates boundaries much more dangerous than that. Humbert is a self-described vile creature who craves Lolita for her nymphet body and soul. After she's escaped him, five or more years later he tracks her down and discovers that she is no longer a nymphet at all, but a grown-up, practical and matter-of-fact, worried about money, thickened and pregnant with the child of a simple, almost stupid, unglamorous man. Humbert observes of her:

There she was with her ruined looks and her adult, rope-veined narrow hands and her goose-flesh white arms, and her shallow ears, and her unkempt armpits, there she was, hopelessly worn at seventeen, with that baby . . . and I looked and looked at her, and knew as clearly as I know I am going to die, that I loved her more than anything I had ever seen or imagined on earth, or hoped for anywhere else.

How can one integrate these contradictions? You have to judge Humbert as responsible for his actions, and yet undoubtedly he's been in the grip of forces beyond his control. Somehow these two irreconcilables—his perversity, which he knows is wrong, and his

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inability to sublimate it—become partially transmuted, at least in literature, by love.

In life there isn't always such an easy resolution. One has to treat people as responsible for their actions, and yet also recognize that they can't help what they do. It's always easier to regard others from the outside. But one can also try to imagine them as they experience themselves, as we all do, from the inside. Then it becomes possible to see that we all deserve mercy. *Tat tvam asi*. Thou art that.

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