How David Beats Goliath

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A non-stop full-court press gives weak basketball teams a chance against far stronger teams. Why have so few adopted it?
Illustration by Zohar Lazar

When Vivek Ranadivé decided to coach his daughter Anjali's basketball team, he settled on two principles. The first was that he would never raise his voice. This was National Junior Basketball—the Little League of basketball. The team was made up mostly of twelve-year-olds, and twelve-year-olds, he knew from experience, did not respond well to shouting. He would conduct business on the basketball court, he decided, the same way he conducted business at his software firm. He would speak calmly and softly, and convince the girls of the wisdom of his approach with appeals to reason and common sense.

The second principle was more important. Ranadivé was puzzled by the way Americans played basketball. He is from Mumbai. He grew up with cricket and soccer. He would never forget the first time he saw a basketball game. He thought it was mindless. Team A would score and then immediately retreat to its own end of the court. Team B would inbound the ball and dribble it into Team A's end, where Team A was patiently waiting. Then the process would reverse itself. A basketball court was ninety-four feet long. But most of the time a team defended only about twenty-four feet of that, conceding the other seventy feet. Occasionally, teams would play a full-court press—that

is, they would contest their opponent's attempt to advance the ball up the court. But they would do it for only a few minutes at a time. It was as if there were a kind of conspiracy in the basketball world about the way the game ought to be played, and Ranadivé thought that that conspiracy had the effect of widening the gap between good teams and weak teams. Good teams, after all, had players who were tall and could dribble and shoot well; they could crisply execute their carefully prepared plays in their opponent's end. Why, then, did weak teams play in a way that made it easy for good teams to do the very things that made them so good?

Ranadivé looked at his girls. Morgan and Julia were serious basketball players. But Nicky, Angela, Dani, Holly, Annika, and his own daughter, Anjali, had never played the game before. They weren't all that tall. They couldn't shoot. They weren't particularly adept at dribbling. They were not the sort who played pickup games at the playground every evening. Most of them were, as Ranadivé says, "little blond girls" from Menlo Park and Redwood City, the heart of Silicon Valley. These were the daughters of computer programmers and people with graduate degrees. They worked on science projects, and read books, and went on ski vacations with their parents, and dreamed about growing up to be marine biologists. Ranadivé knew that if they played the conventional way—if they let their opponents dribble the ball up the court without opposition—they would almost certainly lose to the girls for whom basketball was a passion. Ranadivé came to America as a seventeen-year-old, with fifty dollars in his pocket. He was not one to accept losing easily. His second principle, then, was that his team would play a real full-court press, every game, all the time. The team ended up at the national championships. "It was really random," Anjali Ranadivé said. "I mean, my father had never played basketball before."

David's victory over Goliath, in the Biblical account, is held to be an anomaly. It was not. Davids win all the time. The political scientist Ivan Arreguín-Toft recently looked at every war fought in the past two hundred years between strong and weak combatants. The Goliaths, he found, won in 71.5 per cent of the cases. That is a remarkable fact. Arreguín-Toft was analyzing conflicts in which one side was at least ten times as powerful—in terms of armed might and population—as its opponent, and even in those lopsided contests the underdog won almost a third of the time.

In the Biblical story of David and Goliath, David initially put on a coat of mail and a brass helmet and girded himself with a sword: he prepared to wage a conventional battle of swords against Goliath. But then he stopped. "I cannot walk in these, for I am unused to it," he said (in Robert Alter's translation), and picked up those five smooth stones. What happened, Arreguín-Toft wondered, when the underdogs likewise acknowledged their weakness and chose an unconventional strategy? He went back and re-analyzed his data. In those cases, David's winning percentage went from 28.5 to 63.6. When underdogs choose not to play by Goliath's rules, they win, Arreguín-Toft concluded, "*even when everything we think we know about power says they shouldn't.*"

Consider the way T. E. Lawrence (or, as he is better known, Lawrence of Arabia) led the revolt against the Ottoman Army occupying Arabia near the end of the First World War. The British were helping the Arabs in their uprising, and the initial focus was Medina, the city at the end of a long railroad that the Turks had built, running south from Damascus and down through the Hejaz desert. The Turks had amassed a large force in Medina, and the British leadership wanted Lawrence to gather the Arabs and destroy the Turkish garrison there, before the Turks could threaten the entire region.

But when Lawrence looked at his ragtag band of Bedouin fighters he realized that a direct attack on Medina would never succeed. And why did taking the city matter, anyway? The Turks sat in Medina "on the defensive, immobile." There were so many of them, consuming so much food and fuel and water, that they could hardly make a major move across the desert. Instead of attacking the Turks at their point of strength, Lawrence reasoned, he ought to attack them where they were weak—along the vast, largely unguarded length of railway line that was their connection to Damascus. Instead of focussing his attention on Medina, he should wage war over the broadest territory possible.

The Bedouins under Lawrence's command were not, in conventional terms, skilled troops. They were nomads. Sir Reginald Wingate, one of the British commanders in the region, called them "an untrained rabble, most of whom have never fired a rifle." But they were tough and they were mobile. The typical Bedouin soldier carried no more than a rifle, a hundred rounds of ammunition, forty-five pounds of flour, and a pint of drinking water, which meant that he could travel as much as a hundred and ten miles a day across the desert, even in summer. "Our cards were speed and time, not hitting power," Lawrence wrote. "Our largest available resources were the tribesmen, men quite unused to formal warfare, whose assets were movement, endurance, individual intelligence, knowledge of the country, courage." The eighteenth-century general Maurice de Saxe famously said that the art of war was about legs, not arms, and Lawrence's troops were *all* legs. In one typical stretch, in the spring of 1917, his men dynamited sixty rails and cut a telegraph line at Buair on March 24$^{\text{th}}$, sabotaged a train and twenty-five rails at Abu al-Naam on March 25$^{\text{th}}$, dynamited fifteen rails and cut a telegraph line at Istabl Antar on March 27$^{\text{th}}$, raided a Turkish garrison and derailed a train on March 29$^{\text{th}}$, returned to Buair and sabotaged the railway line again on March 31$^{\text{st}}$, dynamited eleven rails at Hediah on April 3$^{\text{rd}}$, raided the train line in the area of Wadi Dhaiji on April 4$^{\text{th}}$ and 5$^{\text{th}}$, and attacked twice on April 6$^{\text{th}}$.

Lawrence's masterstroke was an assault on the port town of Aqaba. The Turks expected an attack from British ships patrolling the waters of the Gulf of Aqaba to the west. Lawrence decided to attack from the east instead, coming at the city from the unprotected desert, and to do that he led his men on an audacious, six-hundred-mile loop—up from the Hejaz, north into the Syrian desert, and then back down toward Aqaba. This was in summer, through some of the most inhospitable land in the Middle

East, and Lawrence tacked on a side trip to the outskirts of Damascus, in order to mislead the Turks about his intentions. "This year the valley seemed creeping with horned vipers and puff-adders, cobras and black snakes," Lawrence writes in "The Seven Pillars of Wisdom" of one stage in the journey:

We could not lightly draw water after dark, for there were snakes swimming in the pools or clustering in knots around their brinks. Twice puff-adders came twisting into the alert ring of our debating coffee-circle. Three of our men died of bites; four recovered after great fear and pain, and a swelling of the poisoned limb. Howeitat treatment was to bind up the part with snake-skin plaster and read chapters of the Koran to the sufferer until he died.

When they finally arrived at Aqaba, Lawrence's band of several hundred warriors killed or captured twelve hundred Turks, and lost only two men. The Turks simply did not think that their opponent would be mad enough to come at them from the desert. This was Lawrence's great insight. David can beat Goliath by substituting effort for ability—and substituting effort for ability turns out to be a winning formula for underdogs in all walks of life, including little blond-haired girls on the basketball court.

Vivek Ranadivé is an elegant man, slender and fine-boned, with impeccable manners and a languorous walk. His father was a pilot who was jailed by Indira Gandhi, he says, because he wouldn't stop challenging the safety of India's planes. Ranadivé went to M.I.T., because he saw a documentary on the school and decided that it was perfect for him. This was in the nineteen-seventies, when going abroad for undergraduate study required the Indian government to authorize the release of foreign currency, and Ranadivé camped outside the office of the governor of the Reserve Bank of India until he got his way. The Ranadivés are relentless.

In 1985, Ranadivé founded a software company in Silicon Valley devoted to what in the computer world is known as "real time" processing. If a businessman waits until the end of the month to collect and count his receipts, he's "batch processing." There is a gap between the events in the company—sales—and his understanding of those events. Wall Street used to be the same way. The information on which a trader based his decisions was scattered across a number of databases. The trader would collect information from here and there, collate and analyze it, and then make a trade. What Ranadivé's company, *TIBCO,* did was to consolidate those databases into one stream, so that the trader could collect all the data he wanted instantaneously. Batch processing was replaced by real-time processing. Today, *TIBCO*'s software powers most of the trading floors on Wall Street.

Ranadivé views this move from batch to real time as a sort of holy mission. The shift, to his mind, is one of kind, not just of degree. "We've been working with some airlines," he said. "You know, when you get on a plane and your bag doesn't, they actually know right away that it's not there. But no one tells you, and a big part of that is that they don't have all their information in one place. There are passenger systems that

know where the passenger is. There are aircraft and maintenance systems that track where the plane is and what kind of shape it's in. Then, there are baggage systems and ticketing systems—and they're all separate. So you land, you wait at the baggage terminal, and it doesn't show up." Everything bad that happens in that scenario, Ranadivé maintains, happens because of the lag between the event (the luggage doesn't make it onto the plane) and the response (the airline tells you that your luggage didn't make the plane). The lag is why you're angry. The lag is why you had to wait, fruitlessly, at baggage claim. The lag is why you vow never to fly that airline again. Put all the databases together, and there's no lag. "What we can do is send you a text message the moment we know your bag didn't make it," Ranadivé said, "telling you we'll ship it to your house."

A few years ago, Ranadivé wrote a paper arguing that even the Federal Reserve ought to make its decisions in real time—not once every month or two. "Everything in the world is now real time," he said. "So when a certain type of shoe isn't selling at your corner shop, it's not six months before the guy in China finds out. It's almost instantaneous, thanks to my software. The world runs in real time, but government runs in batch. Every few months, it adjusts. Its mission is to keep the temperature comfortable in the economy, and, if you were to do things the government's way in your house, then every few months you'd turn the heater either on or off, overheating or underheating your house." Ranadivé argued that we ought to put the economic data that the Fed uses into a big stream, and write a computer program that sifts through those data, the moment they are collected, and make immediate, incremental adjustments to interest rates and the money supply. "It can all be automated," he said. "Look, we've had only one soft landing since the Second World War. Basically, we've got it wrong every single time."

You can imagine what someone like Alan Greenspan or Ben Bernanke might say about that idea. Such people are powerfully invested in the notion of the Fed as a Solomonic body: that pause of five or eight weeks between economic adjustments seems central to the process of deliberation. To Ranadivé, though, "deliberation" just prettifies the difficulties created by lag. The Fed has to deliberate because it's several weeks behind, the same way the airline has to bow and scrape and apologize because it waited forty-five minutes to tell you something that it could have told you the instant you stepped off the plane.

Is it any wonder that Ranadivé looked at the way basketball was played and found it mindless? A professional basketball game was forty-eight minutes long, divided up into alternating possessions of roughly twenty seconds: back and forth, back and forth. But a good half of each twenty-second increment was typically taken up with preliminaries and formalities. The point guard dribbled the ball up the court. He stood above the top of the key, about twenty-four feet from the opposing team's basket. He called out a play that the team had choreographed a hundred times in practice. It was only then that the defending team sprang into action, actively contesting each pass and shot. Actual basketball took up only half of that twenty-second interval, so that a game's

"To life!"

real length was not forty-eight minutes but something closer to twenty-four minutes—and that twenty-four minutes of activity took place within a narrowly circumscribed area. It was as formal and as convention-bound as an eighteenth-century quadrille. The supporters of that dance said that the defensive players had to run back to their own end, in order to compose themselves for the arrival of the other team. But the reason they had to compose themselves, surely, was that by retreating they allowed the offense to execute a play that it had practiced to perfection. Basketball was batch!

Insurgents, though, operate in real time. Lawrence hit the Turks, in that stretch in the spring of 1917, nearly every day, because he knew that the more he accelerated the pace of combat the more the war became a battle of endurance—and endurance battles favor the insurgent. "And it happened as the Philistine arose and was drawing near David that David hastened and ran out from the lines toward the Philistine," the Bible says. "And he reached his hand into the pouch and took from there a stone and slung it and struck the Philistine in his forehead." The second sentence—the slingshot part—is what made David famous. But the first sentence matters just as much. David broke the rhythm of the encounter. He speeded it up. "The sudden astonishment when David sprints forward must have frozen Goliath, making him a better target," the poet and critic Robert Pinsky writes in "The Life of David." Pinsky calls David a "point guard ready to flick the basketball here or there." David *pressed*. That's what Davids do when they want to beat Goliaths.

Ranadivé's basketball team played in the National Junior Basketball seventh-and-eighth-grade division, representing Redwood City. The girls practiced at Paye's Place, a gym in nearby San Carlos. Because Ranadivé had never played basketball, he recruited a series of experts to help him. The first was Roger Craig, the former all-pro running back for the San Francisco 49ers, who is also *TIBCO*'s director of business development. As a football player, Craig was legendary for the off-season hill workouts he put himself through. Most of his N.F.L. teammates are now hobbling around golf courses. He has run seven marathons. After Craig signed on, he recruited his daughter Rometra, who played Division I basketball at Duke and U.S.C. Rometra was the kind of person you assigned to guard your opponent's best player in order to shut her down. The girls loved Rometra. "She has always been like my big sister," Anjali Ranadivé said. "It was so awesome to have her along."

Redwood City's strategy was built around the two deadlines that all basketball teams must meet in order to advance the ball. The first is the inbounds pass. When one team scores, a player from the other team takes the ball out of bounds and has five seconds to pass it to a teammate on the court. If that deadline is missed, the ball goes to the other team. Usually, that's not an issue, because teams don't contest the inbounds pass. They run back to their own end. Redwood City did not. Each girl on the team closely shadowed her counterpart. When some teams play the press, the defender plays behind the offensive player she's guarding, to impede her once she catches the ball. The Redwood City girls, by contrast, played in front of their opponents, to prevent them from catching the inbounds pass in the first place. And they didn't guard the player

throwing the ball in. Why bother? Ranadivé used that extra player as a floater, who could serve as a second defender against the other team's best player. "Think about football," Ranadivé said. "The quarterback can run with the ball. He has the whole field to throw to, and it's still damned difficult to complete a pass." Basketball was harder. A smaller court. A five-second deadline. A heavier, bigger ball. As often as not, the teams Redwood City was playing against simply couldn't make the inbounds pass within the five-second limit. Or the inbounding player, panicked by the thought that her five seconds were about to be up, would throw the ball away. Or her pass would be intercepted by one of the Redwood City players. Ranadivé's girls were maniacal.

The second deadline requires a team to advance the ball across mid-court, into its opponent's end, within ten seconds, and if Redwood City's opponents met the first deadline the girls would turn their attention to the second. They would descend on the girl who caught the inbounds pass and "trap" her. Anjali was the designated trapper. She'd sprint over and double-team the dribbler, stretching her long arms high and wide. Maybe she'd steal the ball. Maybe the other player would throw it away in a panic—or get bottled up and stalled, so that the ref would end up blowing the whistle. "When we first started out, no one knew how to play defense or anything," Anjali said. "So my dad said the whole game long, 'Your job is to guard someone and make sure they never get the ball on inbounds plays.' It's the best feeling in the world to steal the ball from someone. We would press and steal, and do that over and over again. It made people so nervous. There were teams that were a lot better than us, that had been playing a long time, and we would beat them."

The Redwood City players would jump ahead 4–0, 6–0, 8–0, 12–0. One time, they led 25–0. Because they typically got the ball underneath their opponent's basket, they rarely had to take low-percentage, long-range shots that required skill and practice. They shot layups. In one of the few games that Redwood City lost that year, only four of the team's players showed up. They pressed anyway. Why not? They lost by three points.

"What that defense did for us is that we could hide our weaknesses," Rometra Craig said. She helped out once Redwood City advanced to the regional championships. "We could hide the fact that we didn't have good outside shooters. We could hide the fact that we didn't have the tallest lineup, because as long as we played hard on defense we were getting steals and getting easy layups. I was honest with the girls. I told them, 'We're not the best basketball team out there.' But they understood their roles." A twelve-year-old girl would go to war for Rometra. "They were awesome," she said.

Lawrence attacked the Turks where they were weak—the railroad—and not where they were strong, Medina. Redwood City attacked the inbounds pass, the point in a game where a great team is as vulnerable as a weak one. Lawrence extended the battlefield over as large an area as possible. So did the girls of Redwood City. They defended all ninety-four feet. The full-court press is legs, not arms. It supplants ability

with effort. It is basketball for those "quite unused to formal warfare, whose assets were movement, endurance, individual intelligence ... courage."

"It's an *exhausting* strategy," Roger Craig said. He and Ranadivé were in a *TIBCO* conference room, reminiscing about their dream season. Ranadivé was at the whiteboard, diagramming the intricacies of the Redwood City press. Craig was sitting at the table.

"My girls had to be more fit than the others," Ranadivé said.

"He used to make them run," Craig said, nodding approvingly.

"We followed soccer strategy in practice," Ranadivé said. "I would make them run and run and run. I couldn't teach them skills in that short period of time, and so all we did was make sure they were fit and had some basic understanding of the game. That's why attitude plays such a big role in this, because you're going to get tired." He turned to Craig. "What was our cheer again?"

The two men thought for a moment, then shouted out happily, in unison, "One, two, three, *ATTITUDE*!"

That was it! The whole Redwood City philosophy was based on a willingness to try harder than anyone else.

"One time, some new girls joined the team," Ranadivé said, "and so in the first practice I had I was telling them, 'Look, this is what we're going to do,' and I showed them. I said, 'It's all about attitude.' And there was this one new girl on the team, and I was worried that she wouldn't get the whole attitude thing. Then we did the cheer and she said, 'No, no, it's not One, two three, *ATTITUDE*. It's One, two, three, attitude *HAH* ' "—at which point Ranadivé and Craig burst out laughing.

In January of 1971, the Fordham University Rams played a basketball game against the University of Massachusetts Redmen. The game was in Amherst, at the legendary arena known as the Cage, where the Redmen hadn't lost since December of 1969. Their record was 11–1. The Redmen's star was none other than Julius Erving—Dr. J. The UMass team was very, very good. Fordham, by contrast, was a team of scrappy kids from the Bronx and Brooklyn. Their center had torn up his knee the first week of the season, which meant that their tallest player was six feet five. Their starting forward—and forwards are typically almost as tall as centers—was Charlie Yelverton, who was six feet two. But from the opening buzzer the Rams launched a full-court press, and never let up. "We jumped out to a thirteen-to-six lead, and it was a war the rest of the way," Digger Phelps, the Fordham coach at the time, recalls. "These were tough city kids. We played you ninety-four feet. We knew that sooner or later we were going to make you crack." Phelps sent in one indefatigable Irish or Italian kid from the Bronx after another to guard Erving, and, one by one, the indefatigable Irish and Italian kids fouled out. None of them were as good as Erving. It didn't matter. Fordham won, 87–79.

In the world of basketball, there is one story after another like this about legendary games where David used the full-court press to beat Goliath. Yet the puzzle of the press is that it has never become popular. People look at upsets like Fordham over

UMass and call them flukes. Basketball sages point out that the press can be beaten by a well-coached team with adept ball handlers and astute passers—and that is true. Ranadivé readily admitted that all an opposing team had to do to beat Redwood City was press back: the girls were not good enough to handle their own medicine. Playing insurgent basketball did not guarantee victory. It was simply the best chance an underdog had of beating Goliath. If Fordham had played UMass the conventional way, it would have lost by thirty points. And yet somehow that lesson has escaped the basketball establishment.

What did Digger Phelps do, the season after his stunning upset of UMass? He never used the full-court press the same way again. The UMass coach, Jack Leaman, was humbled in his own gym by a bunch of street kids. Did he learn from his defeat and use the press himself the next time he had a team of underdogs? He did not.

The only person who seemed to have absorbed the lessons of that game was a skinny little guard on the UMass freshman team named Rick Pitino. He didn't play that day. He watched, and his eyes grew wide. Even now, thirty-eight years later, he can name, from memory, nearly every player on the Fordham team: Yelverton, Sullivan, Mainor, Charles, Zambetti. "They came in with the most unbelievable pressing team I'd ever seen," Pitino said. "Five guys between six feet five and six feet. It was unbelievable how they covered ground. I studied it. There is no way they should have beaten us. Nobody beat us at the Cage."

Pitino became the head coach at Boston University in 1978, when he was twenty-five years old, and used the press to take the school to its first N.C.A.A. tournament appearance in twenty-four years. At his next head-coaching stop, Providence College, Pitino took over a team that had gone 11–20 the year before. The players were short and almost entirely devoid of talent—a carbon copy of the Fordham Rams. They pressed, and ended up one game away from playing for the national championship. At the University of Kentucky, in the mid-nineteen-nineties, Pitino took his team to the Final Four three times—and won a national championship—with full-court pressure, and then rode the full-court press back to the Final Four in 2005, as the coach at the University of Louisville. This year, his Louisville team entered the N.C.A.A. tournament ranked No. 1 in the land. College coaches of Pitino's calibre typically have had numerous players who have gone on to be bona-fide all-stars at the professional level. In his many years of coaching, Pitino has had one, Antoine Walker. It doesn't matter. Every year, he racks up more and more victories.

"The greatest example of the press I've ever coached was my Kentucky team in '96, when we played L.S.U.," Pitino said. He was at the athletic building at the University of Louisville, in a small room filled with television screens, where he watches tapes of opponents' games. "Do we have that tape?" Pitino called out to an assistant. He pulled a chair up close to one of the monitors. The game began with Kentucky stealing the ball from L.S.U., deep in L.S.U.'s end. Immediately, the ball was passed to Antoine Walker, who cut to the basket for a layup. L.S.U. got the ball back. Kentucky stole it again. Another easy basket by Walker. "Walker had almost thirty points at halftime,"

Pitino said. "He dunked it almost every time. When we steal, he just runs to the basket." The Kentucky players were lightning quick and long-armed, and swarmed around the L.S.U. players, arms flailing. It was mayhem. Five minutes in, it was clear that L.S.U. was panicking.

"I'm cutting articles out of the newspaper while we still can."

Pitino trains his players to look for what he calls the "rush state" in their opponents—that moment when the player with the ball is shaken out of his tempo—and L.S.U. could not find a way to get out of the rush state. "See if you find one play that L.S.U. managed to run," Pitino said. You couldn't. The L.S.U. players struggled to get the ball inbounds, and, if they did that, they struggled to get the ball over mid-court, and on those occasions when they managed both those things they were too overwhelmed and exhausted to execute their offense the way they had been trained to. "We had eighty-six points at halftime," Pitino went on—eighty-six points being, of course, what college basketball teams typically score in an entire game. "And I think we'd forced twenty-three turnovers at halftime," twenty-three turnovers being what college basketball teams might force in two games. "I love watching this," Pitino said.

He had a faraway look in his eyes. "Every day, you dream about getting a team like this again." So why are there no more than a handful of college teams who use the full-court press the way Pitino does?

Arreguín-Toft found the same puzzling pattern. When an underdog fought like David, he usually won. But most of the time underdogs *didn't* fight like David. Of the two hundred and two lopsided conflicts in Arreguín-Toft's database, the underdog chose to go toe to toe with Goliath the conventional way a hundred and fifty-two times—and lost a hundred and nineteen times. In 1809, the Peruvians fought the Spanish straight up and lost; in 1816, the Georgians fought the Russians straight up and lost; in 1817, the Pindaris fought the British straight up and lost; in the Kandyan rebellion of 1817, the Sri Lankans fought the British straight up and lost; in 1823, the Burmese chose to fight the British straight up and lost. The list of failures was endless. In the nineteen-forties, the Communist insurgency in Vietnam bedevilled the French until, in 1951, the Viet Minh strategist Vo Nguyen Giap switched to conventional warfare—and promptly suffered a series of defeats. George Washington did the same in the American Revolution, abandoning the guerrilla tactics that had served the colonists so well in the conflict's early stages. "As quickly as he could," William Polk writes in "Violent Politics," a history of unconventional warfare, Washington "devoted his energies to creating a British-type army, the Continental Line. As a result, he was defeated time after time and almost lost the war."

It makes no sense, unless you think back to that Kentucky-L.S.U. game and to Lawrence's long march across the desert to Aqaba. It is easier to dress soldiers in bright uniforms and have them march to the sound of a fife-and-drum corps than it is to have them ride six hundred miles through the desert on the back of a camel. It is easier to retreat and compose yourself after every score than swarm about, arms flailing. We tell ourselves that skill is the precious resource and effort is the commodity. It's the other way around. Effort can trump ability—legs, in Saxe's formulation, can overpower arms—because relentless effort is in fact something rarer than the ability to engage in some finely tuned act of motor coördination.

"I have so many coaches come in every year to learn the press," Pitino said. Louisville was the Mecca for all those Davids trying to learn how to beat Goliaths. "Then they e-mail me. They tell me they can't do it. They don't know if they have the bench. They don't know if the players can last." Pitino shook his head. "We practice every day for two hours straight," he went on. "The players are moving almost ninety-eight per cent of the practice. We spend very little time talking. When we make our corrections"—that is, when Pitino and his coaches stop play to give instruction—"they are seven-second corrections, so that our heart rate never rests. We are always working." Seven seconds! The coaches who came to Louisville sat in the stands and watched that ceaseless activity and despaired. The prospect of playing by David's rules was too daunting. They would rather lose.

In 1981, a computer scientist from Stanford University named Doug Lenat entered the Traveller Trillion Credit Squadron tournament, in San Mateo, California. It was a war game. The contestants had been given several volumes of rules, well beforehand, and had been asked to design their own fleet of warships with a mythical budget of a trillion dollars. The fleets then squared off against one another in the course of a weekend. "Imagine this enormous auditorium area with tables, and at each table people are paired off," Lenat said. "The winners go on and advance. The losers get eliminated, and the field gets smaller and smaller, and the audience gets larger and larger."

Lenat had developed an artificial-intelligence program that he called Eurisko, and he decided to feed his program the rules of the tournament. Lenat did not give Eurisko any advice or steer the program in any particular strategic direction. He was not a war-gamer. He simply let Eurisko figure things out for itself. For about a month, for ten hours every night on a hundred computers at Xerox *PARC*, in Palo Alto, Eurisko ground away at the problem, until it came out with an answer. Most teams fielded some version of a traditional naval fleet—an array of ships of various sizes, each well defended against enemy attack. Eurisko thought differently. "The program came up with a strategy of spending the trillion on an astronomical number of small ships like P.T. boats, with powerful weapons but absolutely no defense and no mobility," Lenat said. "They just sat there. Basically, if they were hit once they would sink. And what happened is that the enemy would take its shots, and every one of those shots would sink our ships. But it didn't matter, because we had so many." Lenat won the tournament in a runaway.

The next year, Lenat entered once more, only this time the rules had changed. Fleets could no longer just sit there. Now one of the criteria of success in battle was fleet "agility." Eurisko went back to work. "What Eurisko did was say that if any of our ships got damaged it would sink itself—and that would raise fleet agility back up again," Lenat said. Eurisko won again.

Eurisko was an underdog. The other gamers were people steeped in military strategy and history. They were the sort who could tell you how Wellington had outfoxed Napoleon at Waterloo, or what exactly happened at Antietam. They had been raised on Dungeons and Dragons. They were insiders. Eurisko, on the other hand, knew nothing but the rule book. It had no common sense. As Lenat points out, a human being understands the meaning of the sentences "Johnny robbed a bank. He is now serving twenty years in prison," but Eurisko could not, because as a computer it was perfectly literal; it could not fill in the missing step—"Johnny was caught, tried, and convicted." Eurisko was an outsider. But it was precisely that outsiderness that led to Eurisko's victory: not knowing the conventions of the game turned out to be an advantage.

"Eurisko was exposing the fact that any finite set of rules is going to be a very incomplete approximation of reality," Lenat explained. "What the other entrants were doing was filling in the holes in the rules with real-world, realistic answers. But Eurisko didn't have that kind of preconception, partly because it didn't know enough about

the world." So it found solutions that were, as Lenat freely admits, "socially horrifying": send a thousand defenseless and immobile ships into battle; sink your *own* ships the moment they get damaged.

This is the second half of the insurgent's creed. Insurgents work harder than Goliath. But their other advantage is that they will do what is "socially horrifying"—they will challenge the conventions about how battles are supposed to be fought. All the things that distinguish the ideal basketball player are acts of skill and coördination. When the game becomes about effort over ability, it becomes unrecognizable—a shocking mixture of broken plays and flailing limbs and usually competent players panicking and throwing the ball out of bounds. You have to be outside the establishment—a foreigner new to the game or a skinny kid from New York at the end of the bench—to have the audacity to play it that way. George Washington couldn't do it. His dream, before the war, was to be a British Army officer, finely turned out in a red coat and brass buttons. He found the guerrillas who had served the American Revolution so well to be "an exceeding dirty and nasty people." He couldn't fight the establishment, because he *was* the establishment.

T. E. Lawrence, by contrast, was the farthest thing from a proper British Army officer. He did not graduate with honors from Sandhurst. He was an archeologist by trade, a dreamy poet. He wore sandals and full Bedouin dress when he went to see his military superiors. He spoke Arabic like a native, and handled a camel as if he had been riding one all his life. And David, let's not forget, was a shepherd. He came at Goliath with a slingshot and staff because those were the tools of his trade. He didn't know that duels with Philistines were supposed to proceed formally, with the crossing of swords. "When the lion or the bear would come and carry off a sheep from the herd, I would go out after him and strike him down and rescue it from his clutches," David explained to Saul. He brought a shepherd's rules to the battlefield.

The price that the outsider pays for being so heedless of custom is, of course, the disapproval of the insider. Why did the Ivy League schools of the nineteen-twenties limit the admission of Jewish immigrants? Because they were the establishment and the Jews were the insurgents, scrambling and pressing and playing by immigrant rules that must have seemed to the Wasp élite of the time to be socially horrifying. "Their accomplishment is well over a hundred per cent of their ability on account of their tremendous energy and ambition," the dean of Columbia College said of the insurgents from Brooklyn, the Bronx, and the Lower East Side. He wasn't being complimentary. Goliath does not simply dwarf David. He brings the full force of social convention against him; he has contempt for David.

"In the beginning, everyone laughed at our fleet," Lenat said. "It was really embarrassing. People felt sorry for us. But somewhere around the third round they stopped laughing, and some time around the fourth round they started complaining to the judges. When we won again, some people got very angry, and the tournament directors basically said that it was not really in the spirit of the tournament to have these

weird computer-designed fleets winning. They said that if we entered again they would stop having the tournament. I decided the best thing to do was to graciously bow out."

It isn't surprising that the tournament directors found Eurisko's strategies beyond the pale. It's *wrong* to sink your own ships, they believed. And they were right. But let's remember who made that rule: Goliath. And let's remember why Goliath made that rule: when the world has to play on Goliath's terms, Goliath wins.

The trouble for Redwood City started early in the regular season. The opposing coaches began to get angry. There was a sense that Redwood City wasn't playing fair—that it wasn't right to use the full-court press against twelve-year-old girls, who were just beginning to grasp the rudiments of the game. The point of basketball, the dissenting chorus said, was to learn basketball skills. Of course, you could as easily argue that in playing the press a twelve-year-old girl learned something much more valuable—that effort can trump ability and that conventions are made to be challenged. But the coaches on the other side of Redwood City's lopsided scores were disinclined to be so philosophical.

"There was one guy who wanted to have a fight with me in the parking lot," Ranadivé said. "He was this big guy. He obviously played football and basketball himself, and he saw that skinny, foreign guy beating him at his own game. He wanted to beat me up."

Roger Craig says that he was sometimes startled by what he saw. "The other coaches would be screaming at their girls, humiliating them, shouting at them. They would say to the refs—'That's a foul! That's a foul!' But we weren't fouling. We were just playing aggressive defense."

"My girls were all blond-haired white girls," Ranadivé said. "My daughter is the closest we have to a black girl, because she's half-Indian. One time, we were playing this all-black team from East San Jose. They had been playing for years. These were born-with-a-basketball girls. We were just crushing them. We were up something like twenty to zero. We wouldn't even let them inbound the ball, and the coach got so mad that he took a chair and threw it. He started screaming at his girls, and of course the more you scream at girls that age the more nervous they get." Ranadivé shook his head: never, ever raise your voice. "Finally, the ref physically threw him out of the building. I was afraid. I think he couldn't stand it because here were all these blond-haired girls who were clearly inferior players, and we were killing them."

At the nationals, the Redwood City girls won their first two games. In the third round, their opponents were from somewhere deep in Orange County. Redwood City had to play them on their own court, and the opponents supplied their own referee as well. The game was at eight o'clock in the morning. The Redwood City players left their hotel at six, to beat the traffic. It was downhill from there. The referee did not believe in "One, two, three, attitude *HAH*." He didn't think that playing to deny the inbounds pass was basketball. He began calling one foul after another.

"They were touch fouls," Craig said. Ticky-tacky stuff. The memory was painful.

"My girls didn't understand," Ranadivé said. "The ref called something like four times as many fouls on us as on the other team."

"People were booing," Craig said. "It was bad."

"A two-to-one ratio is understandable, but a ratio of four to one?" Ranadivé shook his head.

"One girl fouled out."

"We didn't get blown out. There was still a chance to win. But ..."

Ranadivé called the press off. He had to. The Redwood City players retreated to their own end, and passively watched as their opponents advanced down the court. They did not run. They paused and deliberated between each possession. They played basketball the way basketball is supposed to be played, and they lost—but not before making Goliath wonder whether he was a giant, after all. ☒

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