The Bus Ticket Theory of Genius

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Everyone knows that to do great work you need both natural ability and determination. But there's a third ingredient that's not as well understood: an obsessive interest in a particular topic.

To explain this point I need to burn my reputation with some group of people, and I'm going to choose bus ticket collectors. There are people who collect old bus tickets. Like many collectors, they have an obsessive interest in the minutiae of what they collect. They can keep track of distinctions between different types of bus tickets that would be hard for the rest of us to remember. Because we don't care enough. What's the point of spending so much time thinking about old bus tickets?

Which leads us to the second feature of this kind of obsession: there is no point. A bus ticket collector's love is disinterested. They're not doing it to impress us or to make themselves rich, but for its own sake.

When you look at the lives of people who've done great work, you see a consistent pattern. They often begin with a bus ticket collector's obsessive interest in something that would have seemed pointless to most of their contemporaries. One of the most striking features of Darwin's book about his voyage on the Beagle is the sheer depth of his interest in natural history. His curiosity seems infinite. Ditto for Ramanujan, sitting by the hour working out on his slate what happens to series.

It's a mistake to think they were "laying the groundwork" for the discoveries they made later. There's too much intention in that metaphor. Like bus ticket collectors, they were doing it because they liked it.

But there is a difference between Ramanujan and a bus ticket collector. Series matter, and bus tickets don't.

If I had to put the recipe for genius into one sentence, that might be it: to have a disinterested obsession with something that matters.

Aren't I forgetting about the other two ingredients? Less than you might think. An obsessive interest in a topic is both a proxy for ability and a substitute for determination. Unless you have sufficient mathematical aptitude, you won't find series interesting. And when you're obsessively interested in something, you don't need as much determination: you don't need to push yourself as hard when curiosity is pulling you.

An obsessive interest will even bring you luck, to the extent

anything can. Chance, as Pasteur said, favors the prepared mind, and if there's one thing an obsessed mind is, it's prepared.

The disinterestedness of this kind of obsession is its most important feature. Not just because it's a filter for earnestness, but because it helps you discover new ideas.

The paths that lead to new ideas tend to look unpromising. If they looked promising, other people would already have explored them. How do the people who do great work discover these paths that others overlook? The popular story is that they simply have better vision: because they're so talented, they see paths that others miss. But if you look at the way great discoveries are made, that's not what happens. Darwin didn't pay closer attention to individual species than other people because he saw that this would lead to great discoveries, and they didn't. He was just really, really interested in such things.

Darwin couldn't turn it off. Neither could Ramanujan. They didn't discover the hidden paths that they did because they seemed promising, but because they couldn't help it. That's what allowed them to follow paths that someone who was merely ambitious would have ignored.

What rational person would decide that the way to write great novels was to begin by spending several years creating an imaginary elvish language, like Tolkien, or visiting every household in southwestern Britain, like Trollope? No one, including Tolkien and Trollope.

The bus ticket theory is similar to Carlyle's famous definition of genius as an infinite capacity for taking pains. But there are two differences. The bus ticket theory makes it clear that the source of this infinite capacity for taking pains is not infinite diligence, as Carlyle seems to have meant, but the sort of infinite interest that collectors have. It also adds an important qualification: an infinite capacity for taking pains about something that matters.

So what matters? You can never be sure. It's precisely because no one can tell in advance which paths are promising that you can discover new ideas by working on what you're interested in.

But there are some heuristics you can use to guess whether an obsession might be one that matters. For example, it's more promising if you're creating something, rather than just consuming something someone else creates. It's more promising if something you're interested in is difficult, especially if it's more difficult for other people than it is for you. And the obsessions of talented people are more likely to be promising. When talented people become interested in random things, they're not truly random.

But you can never be sure. In fact, here's an interesting idea that's also rather alarming if it's true: it may be that to do great work, you also have to waste a lot of time.

In many different areas, reward is proportionate to risk. If that

rule holds here, then the way to find paths that lead to truly great work is to be willing to expend a lot of effort on things that turn out to be every bit as unpromising as they seem.

I'm not sure if this is true. On one hand, it seems surprisingly difficult to waste your time so long as you're working hard on something interesting. So much of what you do ends up being useful. But on the other hand, the rule about the relationship between risk and reward is so powerful that it seems to hold wherever risk occurs. Newton's case, at least, suggests that the risk/reward rule holds here. He's famous for one particular obsession of his that turned out to be unprecedentedly fruitful: using math to describe the world. But he had two other obsessions, alchemy and theology, that seem to have been complete wastes of time. He ended up net ahead. His bet on what we now call physics paid off so well that it more than compensated for the other two. But were the other two necessary, in the sense that he had to take big risks to make such big discoveries? I don't know.

Here's an even more alarming idea: might one make all bad bets? It probably happens quite often. But we don't know how often, because these people don't become famous.

It's not merely that the returns from following a path are hard to predict. They change dramatically over time. 1830 was a really good time to be obsessively interested in natural history. If Darwin had been born in 1709 instead of 1809, we might never have heard of him.

What can one do in the face of such uncertainty? One solution is to hedge your bets, which in this case means to follow the obviously promising paths instead of your own private obsessions. But as with any hedge, you're decreasing reward when you decrease risk. If you forgo working on what you like in order to follow some more conventionally ambitious path, you might miss something wonderful that you'd otherwise have discovered. That too must happen all the time, perhaps even more often than the genius whose bets all fail.

The other solution is to let yourself be interested in lots of different things. You don't decrease your upside if you switch between equally genuine interests based on which seems to be working so far. But there is a danger here too: if you work on too many different projects, you might not get deeply enough into any of them.

One interesting thing about the bus ticket theory is that it may help explain why different types of people excel at different kinds of work. Interest is much more unevenly distributed than ability. If natural ability is all you need to do great work, and natural ability is evenly distributed, you have to invent elaborate theories to explain the skewed distributions we see among those who actually do great work in various fields. But it may be that much of the skew has a simpler explanation: different people are interested in different things.

The bus ticket theory also explains why people are less likely to do great work after they have children. Here interest has to compete not just with external obstacles, but with another interest, and one that for most people is extremely powerful. It's harder to find time for work after you have kids, but that's the easy part. The real change is that you don't want to.

But the most exciting implication of the bus ticket theory is that it suggests ways to encourage great work. If the recipe for genius is simply natural ability plus hard work, all we can do is hope we have a lot of ability, and work as hard as we can. But if interest is a critical ingredient in genius, we may be able, by cultivating interest, to cultivate genius.

For example, for the very ambitious, the bus ticket theory suggests that the way to do great work is to relax a little. Instead of gritting your teeth and diligently pursuing what all your peers agree is the most promising line of research, maybe you should try doing something just for fun. And if you're stuck, that may be the vector along which to break out.

I've always liked Hamming's famous double-barrelled question: what are the most important problems in your field, and why aren't you working on one of them? It's a great way to shake yourself up. But it may be overfitting a bit. It might be at least as useful to ask yourself: if you could take a year off to work on something that probably wouldn't be important but would be really interesting, what would it be?

The bus ticket theory also suggests a way to avoid slowing down as you get older. Perhaps the reason people have fewer new ideas as they get older is not simply that they're losing their edge. It may also be because once you become established, you can no longer mess about with irresponsible side projects the way you could when you were young and no one cared what you did.

The solution to that is obvious: remain irresponsible. It will be hard, though, because the apparently random projects you take up to stave off decline will read to outsiders as evidence of it. And you yourself won't know for sure that they're wrong. But it will at least be more fun to work on what you want.

It may even be that we can cultivate a habit of intellectual bus ticket collecting in kids. The usual plan in education is to start with a broad, shallow focus, then gradually become more specialized. But I've done the opposite with my kids. I know I can count on their school to handle the broad, shallow part, so I take them deep.

When they get interested in something, however random, I encourage them to go preposterously, bus ticket collectorly, deep. I don't do this because of the bus ticket theory. I do it because I want them to feel the joy of learning, and they're never going to feel that about something I'm making them learn. It has to be something they're interested in. I'm just following the path of least resistance; depth is a byproduct. But if in trying to show them the joy of learning I also end up training them to go deep,

so much the better.

Will it have any effect? I have no idea. But that uncertainty may be the most interesting point of all. There is so much more to learn about how to do great work. As old as human civilization feels, it's really still very young if we haven't nailed something so basic. It's exciting to think there are still discoveries to make about discovery. If that's the sort of thing you're interested in.

Notes

[1] There are other types of collecting that illustrate this point better than bus tickets, but they're also more popular. It seemed just as well to use an inferior example rather than offend more people by telling them their hobby doesn't matter.

[2] I worried a little about using the word "disinterested," since some people mistakenly believe it means not interested. But anyone who expects to be a genius will have to know the meaning of such a basic word, so I figure they may as well start now.

[3] Think how often genius must have been nipped in the bud by people being told, or telling themselves, to stop messing about and be responsible. Ramanujan's mother was a huge enabler. Imagine if she hadn't been. Imagine if his parents had made him go out and get a job instead of sitting around at home doing math.

On the other hand, anyone quoting the preceding paragraph to justify not getting a job is probably mistaken.

[4] 1709 Darwin is to time what the Milanese Leonardo is to space.

[5] "An infinite capacity for taking pains" is a paraphrase of what Carlyle wrote. What he wrote, in his *History of Frederick the Great*, was "... it is the fruit of 'genius' (which means transcendent capacity of taking trouble, first of all)...." Since the paraphrase seems the name of the idea at this point, I kept it.

Carlyle's *History* was published in 1858. In 1785 Hérault de Séchelles quoted Buffon as saying "Le génie n'est qu'une plus grande aptitude à la patience." (Genius is only a greater aptitude for patience.)

[6] Trollope was establishing the system of postal routes. He

himself sensed the obsessiveness with which he pursued this goal.

> It is amusing to watch how a passion will grow upon a man. During those two years it was the ambition of my life to cover the country with rural letter-carriers.

Even Newton occasionally sensed the degree of his obsessiveness. After computing pi to 15 digits, he wrote in a letter to a friend:

> I am ashamed to tell you to how many figures I carried these computations, having no other business at the time.

Incidentally, Ramanujan was also a compulsive calculator. As Kanigel writes in his excellent biography:

> One Ramanujan scholar, B. M. Wilson, later told how Ramanujan's research into number theory was often "preceded by a table of numerical results, carried usually to a length from which most of us would shrink."

[7] Working to understand the natural world counts as creating rather than consuming.

Newton tripped over this distinction when he chose to work on theology. His beliefs did not allow him to see it, but chasing down paradoxes in nature is fruitful in a way that chasing down paradoxes in sacred texts is not.

[8] How much of people's propensity to become interested in a topic is inborn? My experience so far suggests the answer is: most of it. Different kids get interested in different things, and it's hard to make a child interested in something they wouldn't otherwise be. Not in a way that sticks. The most you can do on behalf of a topic is to make sure it gets a fair showing — to make it clear to them, for example, that there's more to math than the dull drills they do in school. After that it's up to the child.

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- Spanish Translation
- Russian Translation
- Korean Translation
