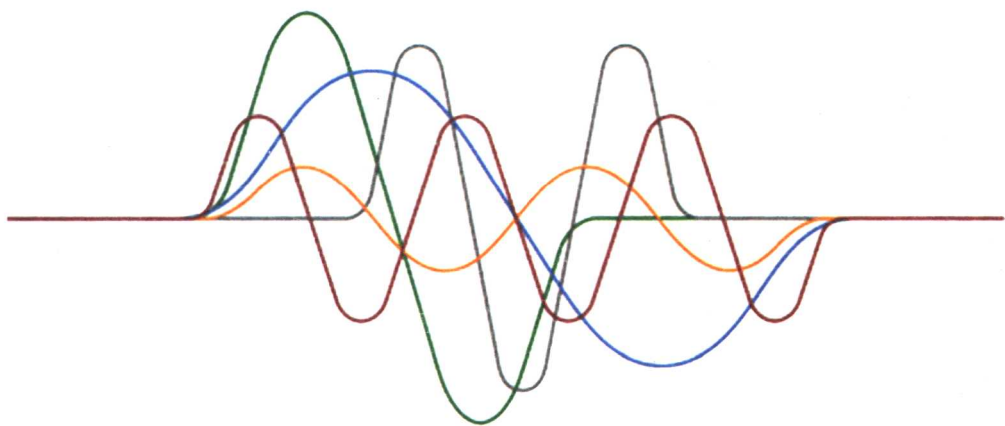


一个数学家的自白



[英]G·H·哈代 著 李泳 评注

湖南科学技术出版社




这篇自白，是哈代感觉失去了数学创造力之后的作品，少了英气，却多了儿女情。“自白”（apology）是苏格拉底的传统，更准确的意旨是“辩护”。哈代本想替数学辩护，尽管在人们看来数学不需要辩护，“因为不论从好的还是坏的理由说，现在没有哪样学科像数学那样被广泛承认，既能带来好处，也值得赞美”。但这并不令哈代满意，令他那样的“真”数学家满意，所以他要“辩护”（defence），不过，“我替数学的辩护将是替我自己辩护，因而多少有些自我和随意”。换句话说，哈代的“辩护”，更像纽曼（John Henry Newman）在 *Apologia Pro Vita Sua*（“为吾生辩护”，有人将这本书译为“生命之歌”）里的意思，是哈代的一曲“数学之歌”，也是他的生命之歌，因为数学就是他的生命。我们还可以说，“自白”是一篇宣言，关于数学美的宣言，一个落魄的英雄的宣言。当年哈代32岁，照他自己的观点，这把年纪不能玩儿数学了。

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A Mathematician's Apology

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A Mathematician's Apology

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致 读 者

帝子降兮北渚，目眇眇兮愁予。

袅袅兮秋风，洞庭波兮木叶下。

——屈原《湘夫人》

你思念的人儿已经飘然来到了水边，你却望不到她的身影，
只有袅袅风从水面拂过，吹落片片黄叶。

现在的洞庭木叶，已然飘落成你打开的书卷。

它们不是来替代你那水边的阿芙洛狄忒，
它们刚走过昨天的辉煌，来找寻明天的生命。

读书是人生，
数完最后一片落叶，留下永恒；

人生是小草，
撷取每一点缤纷，拥抱蓝天。

To
JOHN LOMAS
who asked me to write it

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FOREWORD

t was a perfectly ordinary night at Christ's high table, except that Hardy was dining as a guest. He had just returned to Cambridge as Sadleirian professor, and I had heard something of him from young Cambridge mathematicians. They were delighted to have him back: he was a *real* mathematician, they said, not like those Diracs and Bohrs the physicists were always talking about: he was the purest of the pure. He was also unorthodox, eccentric, radical, ready to talk about anything. This was 1931, and the phrase was not yet in English use, but in later days they would have said that in some indefinable way he had star quality.

哈代从牛津回剑桥。

So, from lower down the table, I kept studying him. He was then in his early fifties: his hair was already grey, above skin so deeply sunburnt that it stayed a kind of Red Indian bronze. His face was beautiful—high cheek bones, thin nose, spiritual and austere but capable of dissolving into convulsions of internal gamin-like amusement. He had opaque brown eyes, bright as a bird's—a kind of eye not uncommon among those with a gift for conceptual thought. Cambridge at that time was

哈代有明星的风采。

full of unusual and distinguished faces—but even then, I thought that night, Hardy's stood out.

爱因斯坦的衣着随意是出了名的。

I do not remember what he was wearing. It may easily have been a sports coat and grey flannels under his gown. Like Einstein, he dressed to please himself: though, unlike Einstein, he diversified his casual clothing by a taste for expensive silk shirts.

板球是哈代的另一半。

As we sat round the combination-room table, drinking wine after dinner, someone said that Hardy wanted to talk to me about cricket. I had been elected only a year before, but Christ's was then a small college, and the pastimes of even the junior fellows were soon identified. I was taken to sit by him. I was not introduced. He was, as I later discovered, shy and self-conscious in all formal actions, and had a dread of introductions. He just put his head down as it were in a butt of acknowledgment, and without any preamble whatever began:

'You're supposed to know something about cricket, aren't you?' Yes, I said, I knew a bit.

朋友常常是通过业余爱好走近的。

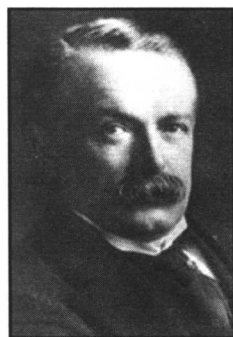
Immediately he began to put me through a moderately stiff viva. Did I play? What sort of performer was I? I half-guessed that he had a horror of persons, then prevalent in academic society, who devotedly studied the literature but had never played the game. I trotted out my credentials, such as they were. He appeared to find the reply partially reassuring, and went on to more tactical questions. Whom should I have chosen as captain for the last test match a year before (in 1930)? If the selectors had decided that Snow was the man to save England, what would have been my strategy and tactics?

(‘You are allowed to act, if you are sufficiently modest, as non-playing captain.’) And so on, oblivious to the rest of the table. He was quite absorbed.

As I had plenty of opportunities to realize in the future, Hardy had no faith in intuitions or impressions, his own or anyone else’s. The only way to assess someone’s knowledge, in Hardy’s view, was to examine him. That went for mathematics, literature, philosophy, politics, anything you like. If the man had bluffed and then wilted under the questions, that was his lookout. First things came first, in that brilliant and concentrated mind.

That night in the combination-room, it was necessary to discover whether I should be tolerable as a cricket companion. Nothing else mattered. In the end he smiled with immense charm, with child-like openness, and said that Fenner’s (the university cricket ground) next season might be bearable after all, with the prospect of some reasonable conversation.

Thus, just as I owed my acquaintanceship with Lloyd George to his passion for phrenology, I owed my friendship with Hardy to having wasted a disproportionate amount of my youth on cricket. I don’t know what the moral is. But it was a major piece of luck for me. This was intellectually the most valuable friendship of my life. His mind, as I have just mentioned, was brilliant and concentrated: so much so that by his side anyone else’s seemed a little muddy, a little pedestrian and confused. He wasn’t a great genius, as Einstein and Rutherford were. He said, with his usual clarity, that if the word meant anything he was not a genius at all. At his best,



Lloyd George (1863 ~ 1945), 1816 ~ 1922 间为英国首相。

哈代承认自己不是天才，
却一样自豪甚至骄傲。

he said, he was for a short time the fifth best pure mathematician in the world. Since his character was as beautiful and candid as his mind, he always made the point that his friend and collaborator Littlewood was an appreciably more powerful mathematician than he was, and that his protégé Ramanujan really had natural genius in the sense (though not to the extent, and nothing like so effectively) that the greatest mathematicians had it.

People sometimes thought he was under - rating himself, when he spoke of these friends. It is true that he was magnanimous, as far from envy as a man can be: but I think one mistakes his quality if one doesn't accept his judgment. I prefer to believe in his own statement in *A Mathematician's Apology*, at the same time so proud and so humble:

'I still say to myself when I am depressed and find myself forced to listen to pompous and tiresome people, "Well, I have done one thing you could never have done, and that is to have collaborated with Littlewood and Ramanujan on something like equal terms."'

哈代能将任何智力工作
变成艺术活动。

In any case, his precise ranking must be left to the historians of mathematics (though it will be an almost impossible job, since so much of his best work was done in collaboration). There is something else, though, at which he was clearly superior to Einstein or Rutherford or any other great genius: and that is at turning any work of the intellect, major or minor or sheer play, into a work of art. It was that gift above all, I think, which made him, almost without realizing it, purvey such intellectual delight. When *A Mathematician's Apology* was first published, Graham Greene in a review wrote that

along with Henry James's notebooks, this was the best account of what it was like to be a creative artist. Thinking about the effect Hardy had on all those round him, I believe that is the clue.

He was born, in 1877, into a modest professional family. His father was Bursar and Art Master at Cranleigh, then a minor public (English for private) school. His mother had been senior mistress at the Lincoln Training College for teachers. Both were gifted and mathematically inclined. In his case, as in that of most mathematicians, the gene pool doesn't need searching for. Much of his childhood, unlike Einstein's, was typical of a future mathematician's. He was demonstrating a formidably high I.Q. as soon as, or before, he learned to talk. At the age of two he was writing down numbers up to millions (a common sign of mathematical ability). When he was taken to church he amused himself by factorizing the numbers of the hymns: he played with numbers from that time on, a habit which led to the touching scene at Ramanujan's sickbed: the scene is well known, but later on I shall not be able to resist repeating it.

It was an enlightened, cultivated, highly literate Victorian childhood. His parents were probably a little obsessive, but also very kind. Childhood in such a Victorian family was as gentle a time as anything we could provide, though probably intellectually somewhat more exacting. His was unusual in just two respects. In the first place, he suffered from an acute self-consciousness at an unusually early age, long before he was twelve. His parents knew he was prodigiously clever, and so

Victorian 时代, 1831 ~
1901 年间

did he. He came top of his class in all subjects. But, as the result of coming top of his class, he had to go in front of the school to receive prizes: and that he could not bear. Dining with me one night, he said that he deliberately used to try to get his answers wrong so as to be spared this intolerable ordeal. His capacity for dissimulation, though, was always minimal: he got the prizes all the same.

看来,对数学的兴趣不一定从娃娃开始。

Some of this selfconsciousness wore off. He became competitive. As he says in the *Apology*: 'I do not remember having felt, as a boy, any *passion* for mathematics, and such notions as I may have had of the career of a mathematician were far from noble. I thought of mathematics in terms of examinations and scholarships: I wanted to beat other boys, and this seemed to be the way in which I could do so most decisively.' Nevertheless, he had to live with an over-delicate nature. He seems to have been born with three skins too few. Unlike Einstein, who had to subjugate his powerful ego in the study of the external world before he could attain his moral stature, Hardy had to strengthen an ego which wasn't much protected. This at times in later life made him self-assertive (as Einstein never was) when he had to take a moral stand. On the other hand, it gave him his introspective insight and beautiful candour, so that he could speak of himself with absolute simplicity (as Einstein never could).

自信、自省、坦白而单纯,是哈代的品格。

I believe this contradiction, or tension, in his temperament was linked with a curious tie in his behaviour. He was the classical anti-narcissist. He could not endure having his photograph taken: so far as I know, there are only five snapshots in existence. He would not have any looking glass in his

哈代的怪癖。



顾影自怜的 Narcissus (Francois Lemoyne 的画)

rooms, not even a shaving mirror. When he went to a hotel, his first action was to cover all the looking- glasses with towels. This would have been odd enough, if his face had been like a gargoyle: superficially it might seem odder, since all his life he was good - looking quite out of the ordinary. But, of course, narcissism and anti-narcissism have nothing to do with looks as outside observers see them.

This behaviour seems eccentric, and indeed it was. Between him and Einstein, though, there was a difference in kind. Those who spent much time with Einstein—such as Infeld—found him grow stranger, less like themselves, the longer they knew him. I am certain that I should have felt the same. With Hardy the opposite was true. His behaviour was often different, bizarrely so, from ours: but it came to seem a kind of superstructure set upon a nature which wasn't all that different from our own, except that it was more delicate, less padded, finer- nerved.

The other unusual feature of his childhood was more mundane: but it meant the removal of all practical obstacles

越熟悉爱因斯坦的人越觉得他怪；哈代则“见怪不怪”了。

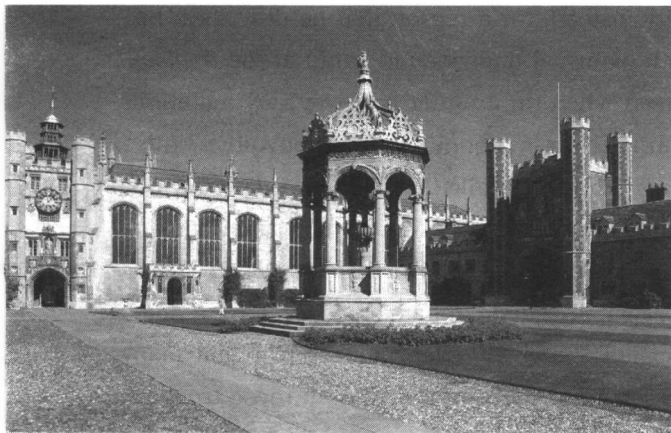
这个 Wells 大概指那位著名的科幻小说家 Herbert George Wells, 他小时候是在图书馆偷偷学习的。

向往自由自在的文法学校。

throughout his entire career. Hardy, with his limpid honesty, would have been the last man to be finicky on this matter. He knew what privilege meant, and he knew that he had possessed it. His family had no money, only a schoolmaster's income, but they were in touch with the best educational advice of late nineteenth-century England. That particular kind of information has always been more significant in this country than any amount of wealth. The scholarships have been there all right, if one knew how to win them. There was never the slightest chance of the young Hardy being lost—as there was of the young Wells or the young Einstein. From the age of twelve he had only to survive, and his talents would be looked after.

At twelve, in fact, he was given a scholarship at Winchester, then and for long afterwards the best mathematical school in England, simply on the strength of some mathematical work he had done at Cranleigh. (Incidentally, one wonders if any great school could be so elastic nowadays?) There he was taught mathematics in a class of one: in classics he was as good as the other top collegers. Later, he admitted that he had been well-educated, but he admitted it reluctantly. He disliked the school, except for its classes. Like all Victorian public schools, Winchester was a pretty rough place. He nearly died one winter. He envied Littlewood in his cared-for home as a day boy at St Paul's or other friends at our free- and - easy grammar schools. He never went near Winchester after he had left it: but he left it, with the inevitability of one who had got on to the right tramlines, with an open scholarship to Trinity.

He had one curious grievance against Winchester. He was a



Chapel at Trinity

natural ball-games player with a splendid eye. In his fifties he could usually beat the university second string at real tennis, and in his sixties I saw him bring off startling shots in the cricket nets. Yet he had not had an hour's coaching at Winchester: his method was defective: if he had been coached, he thought, he would have been a really good batsman, not quite first-class, but not too far away. Like all his judgments on himself, I believe that one is quite true. It is strange that, at the zenith of Victorian games-worship, such a talent was utterly missed. I suppose no one thought it worth looking for in the school's top scholar, so frail and sickly, so defensively shy.

哈代是天生的板球手。

It would have been natural for a Wykehamist of his period to go to New College. That wouldn't have made much difference to his professional career (though, since he always liked Oxford better than Cambridge, he might have stayed there all his life, and some of us would have missed a treat). He decid-

一本书影响人生抉择。

At the University of Cambridge, a wrangler is a student who has completed the third year (called Part II) of the mathematical tripos with first-class honors. The highest - scoring student is named the "senior wrangler"; the second highest-scoring student is the "second wrangler"; the third highest is the "third wrangler", etc.

ed to go to Trinity instead, for a reason that he describes, humorously but with his usual undecorated truth, in the *Apology*. 'I was about fifteen when (in a rather odd way) my ambitions took a sharper turn. There is a book by "Alan St Aubyn" (actually Mrs Frances Marshall) called *A Fellow of Trinity*, one of a series dealing with what is supposed to be Cambridge college life... There are two heroes, a primary hero called Flowers, who is almost wholly good, and a secondary hero, a much weaker vessel, called Brown. Flowers and Brown find many dangers in university life... Flowers survives all these troubles, is Second Wrangler and succeeds automatically to a Fellowship (as I suppose he would have done then). Brown succumbs, ruins his parents, takes to drink, is saved from delirium tremens during a thunderstorm only by the prayers of the Junior Dean, has much difficulty in obtaining even an Ordinary Degree, and ultimately becomes a missionary. The friendship is not shattered by these unhappy events, and Flowers's thoughts stray to Brown, with affectionate pity, as he drinks port and eats walnuts for the first time in Senior Combination Room.

'Now Flowers was a decent enough fellow (so far as "Alan St Aubyn" could draw one), but even my unsophisticated mind refused to accept him as clever. If he could do these things, why not I? In particular, the final scene in Combination Room fascinated me completely, and from that time, until I obtained one, mathematics meant to me primarily a Fellowship of Trinity.'

Which he duly obtained, after getting the highest place in the Mathematical Tripos Part II, at the age of 22. On the way,