

A: 我真的不知道呀,以前还从来没有见过这样的家伙呢。你看,在它背后有一些像是涂鸦的东西呢!

B: 我来看看。能帮我把它挖出来吗?这像是个老古董了。哟!还挺沉的。这些雕文像是一些阿拉伯文字……不,等等,我觉得好像是希伯来文。我们把它翻过来这样看看。

A: 希伯来文!你确定吗?

B: 那个,我小时候学过不少希伯来文,这上面的文字应该差不多都能看懂……

A: 我并没有听说这一带有过很多考古发掘。也许我们又发现了一块罗塞塔石碑 (Rosetta Stone)<sup>1</sup>什么的。它上面写了什么,你能看出门道来吗?

B: 等一下,让我试试……那个上面,右上角是文字开始的地方,好像是“初,万物混沌苍茫,尔后……”

A: 好棒!这听起来像是《圣经》里摩西写的第一卷经书哦。那个不是摩西和他的追随者在动身去往以色列之前在阿拉伯彷徨了四十年的事儿吗?难道……

B: 不,不,这上面写的和古典经文可是大相径庭。咱们先把这个搬到帐篷里去,我想我可以把它翻译出来。

A: Bill,真不可思议啊,这正是你想要的!

B: 对,我是说过我想找点儿什么看看都快想疯了,对吧。尽管这玩意儿和我脑子里想到的东西并不太一样!可我已经等不及想仔细对这东西研究研究——它看起来有点儿不寻常,我还不能断定它上面写的是个故事还是什么别的东西。好像有一些和数有关系的内容,还有……

A: 这石头好像从底部断开来了,它原本更长一些的。

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<sup>1</sup> 一块制作于公元前 196 年的大理石石碑,刻有埃及国王托勒密五世 (Ptolemy V) 的诏书。由于这块石碑刻有同一段文字的三种不同语言版本,近代的考古学家得以有机会对照内容,解读出已经失传千余年的埃及象形文的意义与结构。

- B. A good thing, or we'd never be able to carry it. Of course it'll be just our luck to find out the message is getting interesting, right when we come to the broken place.
- A. Here we are. I'll go pick some dates and fruit for supper while you work out the translation. Too bad languages aren't my thing, or I'd try to help you.
- . . . . .
- B. Okay, Alice, I've *got* it. There are a few doubtful places, a couple signs I don't recognize; you know, maybe some obsolete word forms. Overall I think I know what it says, though I don't know what it means. Here's a fairly literal translation:

**In the beginning, everything was void, and J. H. W. H. Conway began to create numbers. Conway said, "Let there be two rules which bring forth all numbers large and small. This shall be the first rule: Every number corresponds to two sets of previously created numbers, such that no member of the left set is greater than or equal to any member of the right set. And the second rule shall be this: One number is less than or equal to another number if and only if no member of the first number's left set is greater than or equal to the second number, and no member of the second number's right set is less than or equal to the first number." And Conway examined these two rules he had made, and behold! They were very good. And the first number was created from the void left set and the void right set. Conway called this number "zero," and said that it shall be a sign to separate positive numbers from negative numbers. Conway proved that zero was less than or equal to zero, and he saw that it was good. And the evening and the morning were the day of zero. On the next day, two more numbers were created, one**

B: 好事儿,不然我们就搬不动啦。当然,如果说我们更走运一点儿的话,那就是在看到断开的地方之前,已经开始出现一些有意义的文字了呢。

A: 我们到了。我去找些枣儿水果什么的当晚饭,你就在这儿做你的翻译吧。可惜我实在不是搞语言的料,要不然我就帮你一把了。

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B: 好了,Alice,我搞定了。当然还是有些不确定的地方,有些符号我没看明白是什么意思,有些可能是已经废弃不用的构词。大体上我已经知道它讲的是什么内容了,但还没弄明白这些内容是什么意思。下面是严格逐字逐句的翻译:

初,万物混沌苍茫,尔后 J. H. W. H. Conway 始创诸数。Conway 曰,“创生二道,大小诸数盖由此出。其一曰:凡数,皆合于前创二数之集,其位左者,无一大于或等于其位右者。其二曰:甲数小于或等于乙数,当且仅当甲数之左集中无一大于或等于乙数,且乙数之右集中无一小于或等于甲数。”Conway 检视二道,连呼妙哉!此二道真妙绝。

元初之数,左右皆空。Conway 名之曰“零”,命其为正负两界分野之符。Conway 证得,零小于或等于零,此间妙也。夜去昼来,是为零日。次日,又得二数。其一以零为左集,

- B. True. I've got this mad urge to get up before a class and present our results: Theorem, proof, lemma, remark. I'd make it so slick, nobody would be able to guess how we did it, and everyone would be *so* impressed.
- A. Or bored.
- B. Yes, there's that. I guess the excitement and the beauty comes in the discovery, not the hearing.
- A. But it *is* beautiful. And I enjoyed hearing your discoveries almost as much as making my own. So what's the real difference?
- B. I guess you're right, at that. I was able to really appreciate what *you* did, because I had already been struggling with the same problem myself.
- A. It was dull before, because we weren't involved at all; we were just being told to absorb what somebody else did, and for all we knew there was nothing special about it.
- B. From now on whenever I read a math book, I'm going to try to figure out by myself how everything was done, before looking at the solution. Even if I don't figure it out, I think I'll be able to see the beauty of a proof then.
- A. And I think we should also try to guess what theorems are coming up; or at least, to figure out how and why anybody would try to prove such theorems in the first place. We should imagine ourselves in the discoverer's place. The creative part is really more interesting than the deductive part. Instead of concentrating just on finding good answers to questions, it's more important to learn how to find good questions!
- B. You've got something there. I wish our teachers would give us problems like, "Find something interesting about  $x$ ," instead of "Prove  $x$ ."
- A. Exactly. But teachers are so conservative, they'd be afraid of scaring off the "grind" type of students who obediently and

B: 没错。我们每天起得比上课还早,忙着给出我们的结果:定理、证明、引理、讨论。我们做得这么顺手,没人能猜出我们怎么想到的,但是都会觉得那么地令人印象深刻。

A: 或是不胜其烦。

B: 对,你说到点子上了。我猜想兴奋和美感是来源于发现,而不是听别人说。

A: 可是受教的确也很有美感啊。我在听你讲述你的发现,和自己亲自去发现同样享受。区别究竟在哪里呢?

B: 我觉得你说得有道理,在这一点上。我也曾为你的成果而欣喜若狂。因为我自己也早已为同样的问题而奋战多时。

A: 之所以我们以前会感觉厌烦,是由于我们完全没有参与进去。我们仅仅被告知要去吸收别人做出来的成果,所以我们对那些知识没有特别的感觉。

B: 从今以后,我只要在读数学书的时候,都会在看解答之前,尝试自己去想想所有的东西是怎么得到的。就算自己得不到结果,也可以发现证明之美。

A: 我想,我们还可以尝试猜想接踵而来的会有哪些定理,或至少可以猜想,为何人们一开始想要去证明这些定理。创新的部分真的是比那推导的部分有趣多了。比起为问题寻找更好的答案,学去寻找更好的问题才是更重要的!

B: 你确实说出了一些真知灼见。我希望我们的老师能给我们类似“寻找  $x$  的一些有意思的性质”这样的问题,而不是“证明  $x$ ”。<sup>2</sup>

A: 完全同意。但是老师们都太过保守,他们生怕把那些“当一天和同撞一天钟”的那类学生给吓倒了。那些学生只知道顺从地、

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<sup>2</sup> 有关“数学问题之位阶”的讨论,参见 Donald E. Knuth, *Concrete Mathematics*, 第 2 版, p72-73。

mechanically do all the homework. Besides, they wouldn't like the extra work of grading the answers to nondirected questions.

The traditional way is to put off all creative aspects until the last part of graduate school. For seventeen or more years, students are taught examsmanship; then suddenly after passing enough exams in graduate school they're told to do something original.

- B. Right. I doubt if many of the really original students have stuck around that long.
- A. Oh, I don't know, maybe they're original enough to find a way to enjoy the system. Like putting themselves into the subject, as we were saying. That would make the traditional college courses tolerable, maybe even fun.
- B. You always were an optimist. I'm afraid you're painting too rosy a picture. But look, the rain has stopped. Let's lug this rock back to camp and see what it says.

机械地把作业做完。还有,他们不喜欢为获得没有固定导向的问题的答案而花费额外的时间。

传统的做法是在直到学生毕业,都不会把创新的因素融入其中。也就是在十七年或更长的学习生涯中,学生们只被教导着去应试;尔后,在熬过了足够多的考试以后,他们突然被要求去做一些原创性的工作。

- B: 没错。我很怀疑那些真正有原创才能的学生能不能熬那么久。
- A: 哦,这我可说不好,也许他们的原创性足够强,以至于他们可以找到某种办法享受这个体制。比如,让自己投身于某些课题,就像我们刚才讨论的那样。这样做,也许可以使得传统的大学课程变得可以忍受,甚至充满乐趣了。
- B: 你总是这么个乐观主义者啊。不过,我觉得你恐怕把整件事想象得太过美好了。瞧,雨已经停了。我们把这块石头扛回营地,看看上面都说了些什么吧。