SCIENCE & HUMANITIES

WHO WANTS TO BE A SCIENTIST?

Choosing Science as a Career

Nancy Rothwell

剑桥科学素养读本

当科研成为一种职业

董悦生 修志龙 注译

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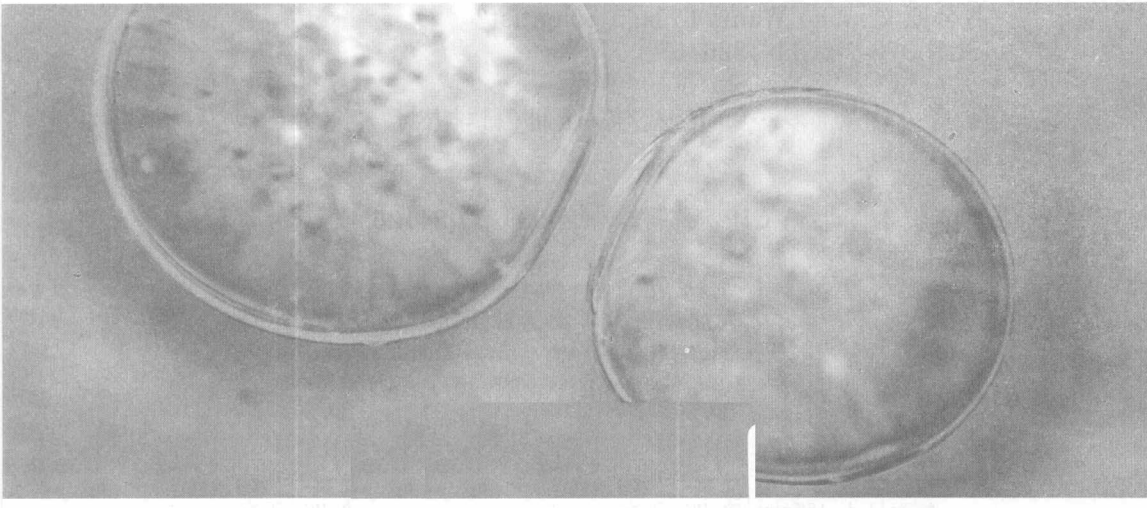

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Who Wants to be a Scientist?

Scientific research is about discovering new things and applying them to improvements in life style for people and animals. But careers in science are now very demanding, requiring much more than a keen scientific mind and practical ability. If you are considering a career in research, have already embarked on your career, want to succeed and are uncertain which route to take, or need to advise, train or supervise scientists, this book should offer some helpful advice. It covers topics ranging from choosing a Ph. D. or post-doctoral position, successful interviews and preparing your CV, to managing your supervisor, giving successful talks, publishing high-quality papers and getting yourself known, as well as broad aspects of science which are so important today, including ethics and fraud, intellectual property and exploitation and disseminating science to the public.

NANCY ROTHWELL is MRC Research Professor of Physiology, School of Biological Sciences, University of Manchester.

当科研成为一种职业

科学研究的目的是发现新事物并将之应用于改善人类及动物的生活状态。但是，现在的科学研究职业本身则很费力气，不仅仅需要对科学的热爱与动手能力。如果你正在考虑是否将科研作为自己一生的职业，或者已经踏上自己的职业之路，或者想有所成就但尚不确定未来的路线，急需一些从事科研工作的建议、训练和指导，本书都能给您提供满意的答案。本书的内容从选择一个博士生或博士后位置开始，讲述如何进行成功的面试，如何准备您的简历，如何与导师打交道，如何进行成功的交流，如何发表高质量的论文，如何提高自己的知名度，以及当今很重要的研究领域的其他方面，包括遵守科研道德，避免欺骗行为，保护知识产权，向公众宣传和传播科学等。

Nancy Rothwell 是曼彻斯特大学生物科学院医学研究理事会（MRC）生理学教授。

My sincere thanks to Professor Mike Stock for his characteristically astute and forthright comments on this book shortly before his untimely death. It was Mike who made me want to be a scientist and helped me to become one, so this book is dedicated to him.

剑桥科学素养读本

编译委员会

编者的话

科学研究的目的是发现新事物并将之应用于改善人类及动物的生活状态。但是，现在的科学研究本身则很费力气，不仅仅需要对科学的热爱。如果你正在考虑将科学研究作为自己一生的职业，或者已经踏上自己的职业之路，或者想有所成就但尚不确定未来的路线，急需一些从事科研工作的建议、训练和指导，《剑桥科学素养读本》丛书将给你提供满意的答案。

《剑桥科学素养读本》丛书全部从英国剑桥大学出版社引进。特邀大连理工大学几位有留学经历、具有丰富相关教学及科研从业经验的教授，对本套丛书逐一进行点评式注译。本系列丛书相辅相成，互为补充，涉及如何规划及实践科研职业，如何写作和发表科研论文，乃至如何作科学报告。我们认为，这套丛书将成为中国读者案头一套必备的科研实战指南。对于有志于从事科研事业的读者来说，实为甘醇雨露，春风化雨。

本套丛书具有以下特色：

• **题材广泛，内容丰富，表达地道**　本套丛书直接选自国外原版，内容广泛。读者可细细品味欣赏，也可随手借鉴，均有开拓视野、提升能力之功效。

• **作者学识渊博，有丰富的教学科研经验**　作者均是在各自学科领域颇有建树的专家学者，他们绝不单纯是知识技能的传授者，更是引导人生道路的前辈。读者在书中可随时感觉到其爱心和耐心，也感受到科学研究作为职业乃至事业的独具魅力的意境。他们的写作风格不尽相同，但能够洞悉母语为非英语的学生学习和使用英语的心态，均使用浅显易懂的语言对各种问题及对策加以解说、诠释，像和朋友在聊天，更像导师在引导你一步步上路。对这套丛书，读者们完全可以用一种轻松的心情去品读。

• **英语原文与中文点评相得益彰，易学易用** 为了让读者品读原文的韵味，丛书采用了点评的注译模式，特别有助于读者在潜移默化中掌握地道的英语、培养英语语感，减少许多不必要的摸索时间。

• **装帧精美，常读常新** 丛书的装帧设计精美大方，品质高雅，以国际水准的精美版面呈现于读者的面前，令读者赏心悦目。加之内容实用可读，在科研的不同阶段，均能从本套丛书中得到不同的收获，颇具收藏价值。不但收藏起图书，更是收藏起你科研道路的足迹。

从作者的“闲言絮语”中，读者尽可体会个中的激情与周到：

> “我喜欢作为一名科学家的我。这是一个让我为之陶醉、为之痴迷的职业。科学领域中像我这样的人比比皆是，他们都专注于在常人看来很抽象的目标。他们很忙碌，甚至全神贯注。这使得通常的交往远非容易。一下子投入到科研领域……职业道路很不稳定……对于一个新加入者来说，看起来前途是如此暗淡。但是，如果你能坚持下来，回报将是巨大的……当你发现了前人没有发现的规律时，这种兴奋会使你义无反顾，这就是一切。”

> “当人们决定要成为一名科研工作者时，通常是因为他们喜欢科学，而不是因为想成为作家。然而，一旦人们开始职业生涯，很快就会发现，一个管道工可以不会写关于管道的文章，也可以生活得很好，而科学工作者的成功则依赖于其写作能力。”

建议读者通读本套丛书，若时间有限，也可以根据自己的需要，以按图索骥的模式选择性地阅读其中的一本或其中的有关章节。相信读者通过本套丛书的帮助，能够增强自己进行科学研究的兴趣和信心，驾驭未来的能力会有质的飞跃，会更自信地应对未来的各种挑战，满怀信心地踏上科研之路。

我们期待着本套丛书能够为读者的事业之鹰插上腾飞的翅膀，能够帮助读者达成理想，从此走向成功。

To Chinese Readers

I am delighted that my book has now been translated into Chinese and I hope that it will prove of value to Chinese students and scientists at all stages of their careers.

Science is an international activity, and increasingly so. Barriers of geography, language and culture are minimal in science and disappearing fast. The best scientists in the world all need rigorous training, extensive experimental expertise, judgement, objectivity and the ability to interpret complex experiments and to plan future studies. But they also require high ethical and moral standards, honesty and integrity, the ability to communicate verbally and in writing and an understanding of how their research fits with the wider communities which they inhabit. They will need to be collaborators, partners, supervisors, mentors and at the highest levels, leaders in the field. Very often young scientists are expected to " acquire" these diverse and challenging skills as if by magic. In some Institutions, training and mentorship is well established, in others it is still emerging. This books attempts to provide some tips and directions on the key issues of attaining success in science.

In visiting Chinese Universities and training Chinese Ph. D. students, I am aware of the wealth of talents in this country. China is rapidly emerging as one of the leading countries for scientific research. It is not by chance that major industries

are seeking to invest research facilities in China, or that the most research active countries in the West are keen to develop partnerships and exchange schemes. China has huge talents, a rich history of discovery and increasing investment in science. So, it is important that its young scientists and aspiring leaders recognise the challenges (and indeed the rewards) they face and are well prepared for these.

This book was written based on my own career, on my supervision of over 40 Ph. D. students and many post docs, and on much time spent on funding bodies and other committees, in the UK. My experiences in Europe and the USA suggest that the principles of that I have written apply similarly in those countries, and the feedback I have so far, suggests that this is the case. I hope that this book also has some value for scientific scholars in China.

Nancy Rothwell

致中国读者

很高兴得知本书被引进到中国出版，真诚希望本书能够对中国的学生和科研工作者有所帮助，指导其顺利经历职业生涯的各阶段。

科学是一项日趋国际化的活动。在科学领域中，地理、语言和文化隔阂的影响很小，而且正在迅速消失。世界上最好的科学家都需要经过严格的训练，掌握多方面的实验技术，具有判断力、客观性，具有阐述复杂实验和设计下一步实验的能力。同时他们也必须具备较高的伦理道德标准，诚实和正直的品质，口头和书面交流的能力，并且懂得如何使研究工作与社会需求紧密结合。他同时又扮演着不同角色，合作者、合伙人、导师、顾问，如果能达到一个最高层次，还将扮演本领域的领军人物角色。许多年轻的科研工作者常常希望能够掌握某种魔力迅速具备上述各式各样极具挑战性的能力。一些研究单位建立了比较好的训练和指导体系，但很多单位这方面还刚刚起步。希望本书能够在科学研究成功与否的关键问题上提供一些建议和指导。

在访问中国的大学和指导中国的博士生的过程中，我认识到中国具有丰富的人才资源。中国正在迅速发展成为科学研究方面的领军国家之一。很多大企业在中国进行研究机构的投资、西方科研发达国家在中国发展合作伙伴、制定交流计划，这些现象都并非偶然。中国拥有大量的人才、悠久的科学史和日益增加的科研投资，所以中国年轻的科研工作者和有抱负的领导者应该充分认识到他们所面临的机遇，并为此做好充分的准备。

我曾经指导过 40 多名博士生和许多博士后，有长期的在英国基金委和其他委员会的工作经历，本书就是以我的职业生涯为基础撰写的。我在欧洲和美国的经历告诉我，我写的这些准则在这些国家同样适用，而且目前得到的反馈意见也证实了这一点。我希望本书同样对中国的科研工作者有益。

Nancy Rothwell

Preface
前　言

科学是复杂的，它影响到我们每个人的方方面面。

选择科研为职业，有些人是为了追求真知和承担一份社会责任，而有些人则是出于好奇或其他因素。写作本书的目的就是要勾勒出以科研作为职业选择的优缺点，告诉读者在科学研究中必须了解的一些事情，以及影响科研工作成功与否的一些主要因素。本书适于那些打算以科研为职业或已经从事科研工作的各个阶段的人。

Science is a complicated business. It affects everyone, in every aspect of their life. It can be argued that anyone who tests variations on a new cooking recipe, studies a new way to manage their garden, compares different methods of travel or new mixtures of paint to decorate their home is employing scientific principles. Of course we are all influenced by science – more so now in the twenty-first century than ever. We all benefit (and sometimes suffer) from advances in technology, medicine, agriculture, often without realising.

Some choose to enter a career in science with real knowledge and commitment, others with naivety and uncertainty. This book is an attempt to highlight the good and the bad aspects of such choices, the things you need to know to get on in research, and factors which may help in making career decisions and in determining success. It could be read by those making the choice about entering research, or those in a scientific career at any level. It is written, without apology, as a personal view on what it takes to achieve success. Not everyone will share these views.

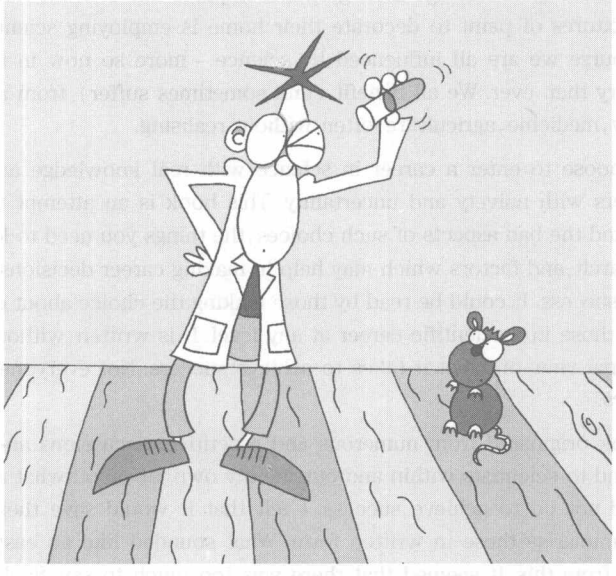
The book originated from numerous and repetitive discussions and presentations by and to scientists within and outside my own lab, aboutwhat they should and should not do to achieve success. I felt that it would save their time and mine to summarise these in written form. What sounded like an easy and brief task, grew from this. It seemed that there was too much to say. Such a book is not, and cannot, be used as a definitive text on what is needed to be successful

as a scientist. I would challenge anyone to write such a book – though many could do so from a position much stronger than mine.

The inspiration to write such a book and much of the content comes from working with very excellent scientists who had not only a great passion for science, but also a real desire to train, transfer experience and impart knowledge to those who worked with them. In particular, Professor Mike Stock was recognised by many in his field of obesity and energy metabolism as a remarkable individual. He was also an outstanding mentor who questioned and challenged, advised and informed on every aspect of science, from designing experiments and writing papers to 'why are you doing research', and 'why should it matter to the man on the street'. Most of these discussions were conducted in the pub. He encouraged me to read widely – from scientific philosophy to the Rubyat of Omar Kyam and Edward Lear. During this reading I learnt a great deal from books written by Sir PeterMedawar. Medawar had much to say about science and scientists and the quotations in each chapter are all from his work. One of these summarises my feelings about this book:

I have tried to write the kind of book I myself should have liked to have read before I began research.

Peter Medawar



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