

**Build and Sustain a Career in Engineering.** Anindya Chatterjee. Notion Press, CIT Colony, Mylapore, Chennai 600 004, India. 2021. 239 pages. Price: Rs 230. ISBN 978-1-63781-623-3.

The imperative mood in the title of the book *Build and Sustain a Career in Engineering* makes it clear that it is a no-nonsense self-help book. The author's intent is not just to tell the readers how to do it; rather, he earnestly wants the readers to build and sustain a career in engineering.

Self-help books are aplenty today. Most bookstores, especially those in airports and malls, have dedicated shelves and aisles for them. They sell well. They offer free advice (nah, it is not free because one must buy the book) with easily readable narrative and seemingly intelligent logic. Problem-focused self-help books serve as bibliotherapy and their positive impact is studied and documented. The impact of growth-oriented books is yet to be systematically ascertained in academic psychology research, notes Bergsma in a paper in the *Journal of Happiness Studies* (2008, 9, 341–360). The books that offer advice on career development come under the growth category. There is a danger in such books because they may give false hope to the readers. The advice given in them may be impractical and unrealistic. The book in question here, written by Prof. Anindya Chatterjee, avoids that pitfall. The book begins by painting a gloomy picture of the future engineering careers and then moves on to give practical advice on how to survive as an engineer. The author clearly states at the outset that it is for a small fraction of engineers who want to develop a long-lasting and fulfilling career.

Written in a conversational style, the book is engaging with ample analogies and

examples to drive home the points it wants to make. The author uses models, simple arithmetic, and effective statistical arguments to make the reader grasp the reality of the engineering job market today and its extrapolation into the future. The future is bleak, he concludes, if another intervention such as the information technology and business process outsourcing does not happen. So, it is imperative to start working to stay relevant in a changing world. He gives advice that is 'actionable and useful' going beyond clichéd soft skills, whether it is on speaking English, making a presentation, giving an interview, choosing between job offers, planning for higher studies, or investing in one's career. All the advice is hinged upon long-term planning and acquisition of skills that keep one relevant in the dynamic job market.

The premise for author's argument in giving a wakeup call to young engineers (or perhaps older ones too) is the *wage rate pyramid*. The concept of the wage pyramid is well known: fewer people get higher wages. By bringing in the *rate* into the picture, the author emphasizes the dynamic nature of the wage pyramid. What flattens the pyramid and what fattens it? The author's argument is that a larger number of people becoming qualified for the higher posts flattens the pyramid. What fattens it? New work that requires new skills. This dynamism could have been captured pictorially better in the illustration (which looks somewhat static now) perhaps using a mechanical model with forces shown and changing profile of the wage pyramid. A small end-of-the-chapter exercise for readers to work it out would have brought the engineering spirit. Why is such an exercise beneficial?

The effectiveness of self-help books depends on the readers. How much of what is conveyed is transmitted to the readers? How does one ensure that what is transmitted stays in the minds of the readers? Self-help books tend to be convincing while reading them because of their compelling arguments. Sometime later, both the points and the arguments may be forgotten. The analogies and models are more quickly forgotten if the mind is not engaged in a mental exercise that involves the user. For example, there are two chapters in the book that focus on campus interviews. A lot of sage advice is given. Would it work for a student who reads this book in the sophomore year? Would it all be remembered two years later? Just like the author, in another context, discussed fluid intelli-

gence and crystallized intelligence, there is transient memory and residual memory. The details of arguments may be forgotten but the essential point should stay. Since this book is intended for young jobseekers, it may not be out of place to have some exercises that test the assimilation of the readers. In the case of interviews, the author emphasizes honesty, command on the basics of the subjects, and the strength of character. A few questions that test the understanding of the young reader will be useful.

There is a mention of an engineering graduate who tried multiple careers and settled finally as a restaurateur. The author says that this person is successful in the restaurant business because he uses engineering principles. What are those? One wonders. Fortunately, there are three case studies written by individuals who worked in the industry. They are listed as external opinions in the book. They are external from the author's perspective but internal to the subject matter of the book. One of them brings home a fine point about Indian engineers engaged in outsourced work from the US. Many of them have the tendency to commit to doing something without thinking through the time and effort a task needs. Trouble arises if the commitment is not fulfilled and sincere effort is not put in. Then the trust erodes, costing the individual. How do we ensure that such fine points are grasped and retained by the readers? Reading a self-help book is somewhat like listening to a moral discourse. It all makes sense while listening, but it may soon evaporate and not be recalled at the time of need.

Since the book is just written and the author is an active academic researcher, it is not a bad idea to conduct a study on the influence of this book on the readers. Would it sway a fresh engineering graduate towards a job that offers lower salary but better long-term prospects from another that gives higher salary but less promise in the future? Would it make a student focus on improving mathematical and modelling skills? Would it open an engineer's mind to take risks and innovate than going for low-hanging fruit?

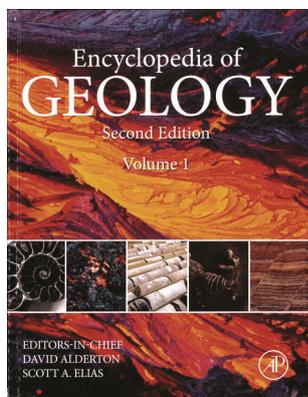
Even if a young reader does not imbibe the essence of this thoughtful book, there is another use for it. It is a great resource for experienced people who are often approached by youngsters seeking advice. The little anecdotes, compelling analogies, and statistics arguments are extremely useful for mentors as much as it is for mentees.

## BOOK REVIEWS

The two closing chapters make the reader want more. There is a mention of ‘engineering temper’ in the foreword of the book written by Prof. Abhay Karandikar. The book includes at least three anecdotes where engineering temper of the author is evident. What one learns in an engineering course of study ought to be the savior for an engineer. Soft skills, managerial abilities, personality traits, etc., are necessary but not sufficient to thrive in the long run. A person who can analyse things around, look at them from an engineering perspective, and constantly think about how to improve them is the one who is likely to climb towards the top of the wage pyramid. Such a person can also fatten the pyramid by bringing in new work. Cultivating the engineering temper would certainly help one build and sustain a career in engineering.

G. K. ANANTHASURESH

*Department of Mechanical Engineering,  
Indian Institute of Science,  
Bengaluru 560 012, India  
e-mail: suresh@iisc.ac.in*



**Encyclopedia of Geology, Second Edition, Vols 1 to 6.** David Alderton and Scott A. Elias (Editors-in-Chief). Academic Press, an imprint of Elsevier, 125, London Wall, EC2Y 5AS, UK. 2021. 5622 pages. Price: US\$ 2900.00.

Encyclopedias as compendiums that provide state of the knowledge either of one field of study or all the branches of knowledge have always found a respectable niche in libraries and educational institutes of the world. Encyclopedia as a cultural artefact has evolved over the ages and acquired a universal format as preserving

medium of human knowledge. The first encyclopedia in history, with all its traditional attributes, is said to be Pliny’s *Naturalis historia*. Prepared in the first century CE, and the first of its kind, this work is considered as an ambitious work that ranges from astronomy to geology and from art to zoology. This work reflecting the pre-renaissance understanding of the world and containing widely speculative and often packed with erroneous explanations, however, offers a peephole of the world as it was understood in the earliest part of the first millennium. Primarily an explorer-cum-science communicator, Pliny, the elder himself died while investigating the volcanic eruption that famously destroyed the ancient city of Pompeii in 79 CE. The post-renaissance cultural period in Europe along with the popularization of printing techniques witnessed a large transformation in the format of encyclopedias that also resulted in their wider diffusion. The 21st century saw the domination of digital and crowd-sourced versions, such as Wikipedia, as reference tools, partly replacing the traditional formats. The development of the electronic, multimedia encyclopedia also resulted in transforming the market and growth of readership. When I initially viewed the hefty tomes of *Encyclopedia of Geology*, the immediate question that came to my mind was how a new generation prospective user would approach such heavy print volumes, who is probably more at ease using digital platforms. And, as I started leafing through these volumes, the old-fashioned book lover in me, however, could not help liking its weight in my hands.

*Encyclopedia of Geology, Second Edition*, as indicated by its editors-in-chief, is an improvement over the first edition, reflecting the advances in geological sciences in the last 15 years, since the original publication. In contrast to the first edition that was primarily rocks-based, the editors-in-chief say that the second edition has expanded its coverage to include solid-Earth interactions with the atmosphere and hydrosphere. This broader perspective is necessitated by the realization that the geology has evolved into a multidisciplinary area of research, now coming under an all-encompassing umbrella-term ‘Earth sciences’, wherein increased application of chemistry, physics, mathematics, biology, and astronomy has become a norm. *Encyclopedia of Geology* in six volumes totaling 5622 pages presents state-of-the-art reviews on the key aspects of Earth and

planetary research. The sections include: the solar system, tectonics and structural geology, geophysics, geochemistry, mineralogy, igneous geology, metamorphic geology, surface processes and sediments, history of life, regional geology, geological resources, palaeoclimates and applied geology. Mainly targeting the undergraduates and teachers as well as general readership, each of the 340 articles follows a standardized format that includes fundamental concepts and theory, followed by future directions. New areas of discussion cover mass extinctions, origins of life, prospects of life beyond Earth, plate tectonics and its influence on faunal provinces, new types of mineral and hydrocarbon deposits, methods of dating rocks, and surface processes. The techniques of remote sensing and other tools of investigations such as electron microprobe analysis and fluid inclusion, are discussed in detail. Commenting on each one of the articles in these volumes, as expansive as these are, is not a practical proposition. Naturally, a researcher is expected to go more carefully through the chapters that are of immediate interest to him. That is what I am doing in this commentary.

The first volume begins with an article on the history of geology most comprehensively written by the distinguished scholar and geologist, Celâl Şengör (Istanbul Technical University). Growth of geological knowledge from pre-history to classical Greco-Roman times and the awakenings during European renaissance, ending finally with the plate tectonic revolution receives a broad-brush treatment in this article. This article sets the stage for rest of the chapters – as if the acquired geological knowledge waiting for a cue to break open its seams to spread over the rest of the pages of encyclopedia. The succeeding chapters in the volume deal with the solar system and planetary geology, and of course meteorites – the geological time slice freebies delivered to us from the outer space, as it were a bonus for all our expensive nail-biting technological feats to understand the planetary geology. The chapter on ‘Prospects for life beyond Earth’ summarizes the new scientific clues on the possibilities for life in some of the planets and the moons (by Davila and Parenteau). The tragic destiny of Mars – where a life-supporting environment had existed in its early phase is particularly a gripping story. The authors say that ‘it is a “tale of two planets”, one that is barren inhospitable desert today and the other that