one-dimension in a capillary and in two-dimensions in a monolayer of cells, both pioneered in the author's laboratory. The result is a blend of the macroscopic, microscopic and molecular views of development. Taking us through the fascinating molecular studies on development, Bonner compares this to 'following a rainbow at breakneck speed looking for the pot of gold at the end'. While acknowledging the immense contributions of the molecular studies, he cautions us that the 'search for gold may involve an infinity of regressions'. So what is the solution? The best is an integration that brings together different approaches and ideas, including mathematical models, that address the central issues of development. The bottom line is, we are trying to understand what happened millions of years ago by studying organisms that have gone through the process of natural selection, time after time. In this connection, the mathematical models help us strip the inherent complexity and redundancy present in living systems that have become complex over the years.

In summary, in a world that is exploding with information, generated predominantly by the reductionistic approach of molecular biology, Bonner's book helps us to keep in perspective the fundamental conceptual issues of multicellular development. The book's message is that initially, there was a selection for larger size, easily achieved by multicellularity. The evolution of signal-receptor systems helped the maintenance of the multicellular state by a process of integration. Subsequently, efficiency was achieved by cell differentiation, aided primarily by the polarity conferred by the environment. The multicellular organisms of today are the ones that have successfully gone through these processes several times in evolution. This simple message will appeal to both professional developmental biologists as well as students of biology initiating their study of development.

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**A Treatise on Fluorosis.** A. K. Susheela. 2001. 119 pp. Price: Rs 300.

In *A Treatise on Fluorosis*, A. K. Susheela emphasizes the toxic effects of excessive fluoride ingestion. Skeletal fluorosis, dental fluorosis and non-skeletal fluorosis, like the involvement of skeletal muscles, red blood cells and gastrointestinal tract are highlighted and their differential diagnosis is discussed in detail. Early examination methods are suggested and the book is illustrated with detailed case reports of toxic fluorosis. The tables and illustrations are clear, the book is student-friendly and made easy to read. Prevention of fluorosis with special reference to proper diet is very well brought out. The recipes given seem to be well tried-out. Screening tests recommended are practical and useful.

A statement appears in the book (p. 60) that 'dental caries has no correlation with water fluoride content' and again 'fluorosis occurs even with 0.6 mg/l of fluoride in drinking water' as shown in a study in Machgar village. This statement is made on the basis of an MDS thesis by Gajender Singh Meena in 1983. This is however debatable. In 1901, Fredrick McKay (*Dent. Cormos*, 1916, **58**, 477–484) of Colorado, USA noted that many of his patients had permanent stains on their teeth. These brown stains were related subsequently to the presence of fluoride in the drinking water. Systemic investigations by Dean *et al.* (*Public Health Rep.*, 1931, **54**, 852–888) from 1920 to 1936 concluded that water containing 1 ppm fluoride had maximum cariostatic effect. This led to a major breakthrough in preventive dentistry.

In spite of the abundance of data on the role of fluoride as a most safe, economical and effective tool for prevention of dental caries, controversies erupt from time to time throughout the world and the scenario in India is no different. Its safety has been repeatedly established and a voluminous literature exists on this subject. The Federal Register of US Food and Drug Administration has declared fluoride as an essential nutrient for human health and the WHO expert committee (WHO Tech. Rep. Series No. 532.5, 1977) on trace elements in human health also includes fluoride among 14 trace elements essential for the normal growth and development of human health.

So convincing has been the effect of water fluoridation as a public health measure to curb dental caries that by mid-1980s, approximately half of the population of USA (105 million) was consuming optimally fluoridated water. Approximately 60 million people in 40 countries elsewhere are protected by artificial fluoridation.

In India, 5% of the population lives in endemic fluoridated areas and another 3% in optimal fluoride areas (Tewari, Amrit, *J. Indian Dent. Assoc.*, 1986, pp. 9–10). Thus, 85–90% of the population lives in fluoride-deficient areas. Systemic research in the various physiological, metabolic and toxic aspects of fluoride reveals that 1 ppm of fluoride in drinking water has no biological side effects on the vital organs of the human body. Observations in endemic fluorosis areas reveal that fluoride up to 4 ppm in drinking water produces skeletal fluorosis and above 8 ppm, coupled with malnutrition, causes not only skeletal fluorosis but also irreversible bony changes and deformities.

Therefore, in the human system fluorides have a dual role, i.e. a harmful effect above 4 ppm and a caries-preventive and health-promoting effect at 1 ppm.

Susheela's treatise deals only with the toxic effects of fluoride. It is however necessary to balance this against the merits of controlled fluoridation of water supply for the prevention of dental caries. The book will appeal to all students of dentistry and dental practitioners.

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