essays are not in any specific order. He suggests that you dip into it at random. Yes, indeed. It is an excellent arm-chair book for both professionals and amateurs.

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The State of Food and Agriculture 2000 – FAO Agriculture Series No. 32. Food and Agriculture Organization of the United Nations, Rome. 2000. 329 pages. Price not mentioned.

This annual report issued by Food and Agriculture Organization (FAO) contains authentic data on trends in food production in different parts of the world. It serves as a monitor of progress and problems. The problems considered relate to both natural factors like climate and political factors which determine public policy.

The year 2000 report points out that world agricultural production during 1998 and 1999 registered only modest growth. There is a general slowing down of agricultural growth in developing countries. Yield plateaus in major cereals and a steady decline in factor productivity (such as response to fertilizers) are widespread.

Besides providing data and analysis relating to the current agricultural situation, the year 2000 report contains a comprehensive chapter on the progress made in world food and agriculture during the 50-year period, 1950–2000. The progress made during each decade is discussed. On the positive side, it is evident that in spite of the increase in population by 2.5 times between 1950 and 2000, food availability and intake have shown significant improvement. Progress has, however, been uneven in various regions of the world, with sub-Saharan Africa registering the slowest growth rate.

Since 1970, the number of undernourished has doubled in Africa, while it has been halved in east and south-east Asia. Overall, more than 800 million people are still chronically undernourished. Nearly 30% of them are in India. In addition, over 2 billion suffer from hidden hunger caused by micronutrient deficiences, particularly iron.

The report clearly brings out that development strategies that emphasize on agricultural growth have proved to be cost-effective in providing the poor with entitlement to food. The 'technological capital' of a country plays an important role in determining the pace of progress in crop husbandry, animal husbandry, fisheries and forestry. However, the threat to progress in a country like India, which is endowed with a rich technological capital, comes from the serious damage caused to the ecological foundations essential for sustained advances in biological productivity. There are still no regulations in India which can prevent either prime farmland from going out of farming or the unsustainable exploitation of groundwater. The indiscriminate application of chemical pesticides and mineral fertilizers and lack of attention to micronutrient deficiencies in the soil are other factors which threaten the future of agriculture. Production agriculture still suffers from integrated attention to soil health care, water management, based on the principle 'more crop per drop', control of pests, pathogens and weeds and post-harvest technology.

The report concludes with the statement, 'It is humankind that is responsible for having imposed hunger on itself for so long, but humankind is also capable of eliminating this burden. There can be no greater challenge than this'. The report also refers to the 'window of opportunity' opened up by globalization. However, all the evidence since 1994 when the World Trade Agreement came into force indicates that the Agreement on Agriculture has resulted in an unfair and unequal trade bargain. OECD countries have been increasing domestic support to their farmers, providing export subsidies and restricting market access through both tariffs and sanitary and phytosanitary regulations. The Trade Related Intellectual Property Rights (TRIPS) component of the agreement is resulting in a rapid expansion of proprietary science and shrinking of public good research supported from public funds.

Indian agriculture is now at the cross-roads. Without attention to sustainable natural resources management and to improving crop productivity and post-harvest technology, it may be difficult to sustain the economic viability of farming. At the same time, agriculture is the backbone of the livelihood security system of the country, since 70% of the population depend on agriculture for income and employment. External threats include competition for important foods and transnational super-markets, expansion of proprietary science and potential changes in climate and sea level caused by global warming. We should develop packages of technology and public policy to address these issues.

The report refers to the impact of the far-reaching agrarian reforms introduced in China in 1978. China is unique in developing an integrated strategy for on-farm and non-farm employment. Over 100 million agricultural workers were provided with employment opportunities in Rural Township enterprises. This reduced the pressure of population on land. India can benefit from the Chinese experience and develop a strategy for providing 100 million workers belonging to landless labour families, opportunities for skilled livelihoods in the off-farm sector. This will call for well-planned efforts in farming systems intensification, diversification and value-addition.

FAO is to be complimented on the design of these annual *State of Food and Agriculture* reports. They are both descriptive and prescriptive. In addition to a critical analysis of the available data relating to agricultural production and food security, one or two topics of general interest are taken up for more detailed attention. This year's special chapter provides a synoptic account of global agricultural evolution since 1950. The technological and public policy landmarks are flagged. The report is user-friendly. The report also included a SOFA 2000 diskette containing time series data for 150 countries in English, French and Spanish. The diskette includes FAOSTAT TS softens to ensure easy access and use.

All institutions interested in food and nutrition should possess a copy of this valuable report.

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Dorothy Hodgkin – A Life. Georgina Ferry. Granta Books, 2–3 Hanover Yard, London N18 BE, UK. 1998. Price: 20 £. 423 pages.

On the one hand, to write a biography of a much-loved scientist who remains in the near-memory of her colleagues cannot be an easy task. On the other hand, a more intriguing subject for biography than Dorothy Hodgkin – one of the most important crystallographer-chemists of the 20 century – would perhaps be hard to come by. Georgina Ferry's biography written four years after Dorothy's death in 1994 overcomes the former and rejoices in the latter resulting in a scientific biography that is a pleasure to read.

The book starts by describing the early years (1910–1928) with the children of Molly and John Crowfoot (Dorothy being the eldest) being shuttled between Africa and England; war and a colonial lifestyle ensuring that from the age of four onwards, Dorothy and her parents never truly lived under the same roof. Despite this rather shaky start, one cannot lose sight of the fact that for England in the 1920s and 1930s Dorothy had a rather privileged childhood and certainly her entry into Somerville, Oxford to pursue a university education was not at all seen as out of the ordinary. Her interest in science was kindled at an early age, starting with a fascination for the chemical analysis of minerals – the story of 'Uncle Joseph' and the analysis of ilmenite is familiar. This interest was nurtured in the Sir John Leman School, where Dorothy was permitted to attend the chemistry lab. Encouraging of her scholastic turn, her mother also seems to have instilled a strong sense of responsibility in Dorothy.

From the chapter describing the period 1928–1932, we gather that Somerville was not successful in quenching Dorothy's having 'got to know' and this was the period when her interest in crystallography reached fruition. Interestingly, she does not seem to have been mentored in this interest, although she was exposed to the mineralogists Barker and Porter, the latter having taught her in Somerville. In 1929, she read a special issue of *Transactions of the Faraday Society* on the determination of crystal structures by the use of X-rays and this seems to have decided her future career. For a 19-year-old to browse the literature and be inspired to follow a certain career path is clearly quite out of the ordinary and given the time, perhaps reminiscent of a young S. Chandrasekhar in Madras. Combining her quest for an education with the somewhat onerous task of taking care of her sisters (her parents now somewhere in the Middle East) seemed to come naturally, auguring well for a career that would call for being able to do a number of things at once. This is narrated quite poignantly. By the time she reached her honors year in Oxford, she was ready to start her work with H. M. Powell in the Mineralogy Department, on the crystal structures of dialkyl thallium halides. These compounds were cleverly chosen as a bridge between the then uncharted territory of organic structures and the structures of already well-known salts.

Her real break as described in the third chapter (1932–1934) came when she spent two years with Bernal in Cambridge, establishing herself as a very competent crystallographer, working on the structure of sterols – a problem of great relevance in Bangalore in the way that sterols relate to liquid crystals. We see that Dorothy was by no means a lone woman in crystallography. Kathleen Lonsdale had already performed pioneering work on benzene in the lab of Bragg *fils* in the Royal Institution and Helen Megaw, a co-worker of Bernal in Cambridge, had started her incredibly productive career correlating properties of inorganic materials to their crystal structures. Ferry emphasizes throughout Dorothy's own assertion that gender was never an impediment to her career, nor to the manner in which she was treated by her colleagues. This viewpoint should by no means be taken as universal. Crystallography (particularly, British crystallography) had been associated with distinguished women from the very beginning. The reason was that Bragg *père et fils* in their respective labs recognized women to be perfectly capable of doing science. This tradition was continued by people like Bernal. The importance of such a tradition receives unfortunately little mention in the book.

In 1934, Oxford won back Dorothy with a fellowship. In setting up a lab, she wrote out a list of what she needed and Robert Robinson passed this on to Imperial Chemical Industries, which obliged with the royal sum of £ 600. In return, Robinson expected to be helped out with the X-ray analysis of compounds prepared in his vast lab, but in this he seems to have more than redeemed himself when he gave Dorothy her first insulin samples. The 1934–1937 chapter also describes Dorothy's near-affair with a separated Conrad Waddington, her affair with a married Bernal and her meeting and marrying Thomas Hodgkin – the man with whom she would share nearly as much of her life as she did with the structure of insulin. In all this, I should emphasize that Ferry provides just the right amount of detail and this must be no mean task. Certainly, one *does* wish to hear about the vicar interspersing the marriage service of Dorothy and Thomas with quotations from Marx.

The chapter describing the years 1938 and 1939 includes the birth of her first child and her first serious attack of rheumatoid arthritis (the condition of her hands later immortalized by Henry Moore). Amidst all this she continued to pioneer the crystallography of proteins – out of the seven proteins examined by X-rays at that time, four were her work.

The war years (1939–1945) were enormously productive for Dorothy. With her student Harry Carlisle, she determined the complete three-dimensional structure (more precisely, a mirror image thereof) of cholesteryl iodide. At that time, no complete structure of any molecule of that size had been attempted. It was certainly the first molecule of any biochemical significance to have its complete crystal structure revealed. The first of many Rockefeller grants started pouring in and the Oxford scientists Florey and Chain sensitized her to an important molecule called penicillin. Her letters to her husband at this time seamlessly go from describing the weight of her second child to her efforts to crystallize penicillin. We also learn that she pioneered the