

One of the most fruitful sources of one-parameter semi-groups is the theory of linear partial differential equations; this is the basis of chapter 20. In chapter 21, one-parameter semi-groups are applied to Abel summability, Hausdorff matrices, Markoff chains and probability matrices, Stochastic processes, and fractional integration. This chapter contains some highly interesting matter.

Finally, there is an appendix (chapter 22) on Banach algebras; here the emphasis is shifted from analysis to algebraic questions. There is an excellent bibliography.

The general presentation and style of the book is beyond praise. It is a book which is likely to promote copious research, and will be appreciated by mathematicians everywhere.

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<sup>1</sup> *Proc. London Math. Soc.*, (2), 50, 11 (1948).

<sup>2</sup> *Ann. Math.*, (2), 48, 827 (1947).

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## FARM CROPS

### Cultivated Plants of the Farm

By Dr. G. D. H. Bell. Pp. xii+199+36 plates. (Cambridge: At the University Press, 1948.) 15s. net.

THIS book on "Cultivated Plants of the Farm" breaks new ground both as regards its methods of treatment and the scope of its subject. Cultivated plants are not confined to any one area; but the same type is found over many parts of the world. The important point is that species and varieties vary, some being very widespread, and others more limited in scope. Cereals, such as wheat, barley and oats, have been in use for hundreds, even thousands, of years, and in one form or another are to be found all over the world. Others, such as potatoes and seed crops, are relatively younger and are in active process of being developed for use in various parts. Dr. G. D. H. Bell devotes a relatively small part of his book to a general survey of his subject, summarizing the main problems, dealing with the cultivation and economic conditions of crop plants, the present position of British crop husbandry, and the essential nature of crop rotation. After this the individual crops are dealt with separately, the wider scope of each being emphasized, though the greater part of the work deals with its relation to Britain.

Grassland in its various forms occupies a larger area of Britain than any other form of vegetation, and, owing to its ability to be used either as a short- or long-term crop, can fit in either as a rotation crop or as one which occupies the same ground for long periods of years. Its use as a rotation crop is one which is playing an increasingly important part in modern systems of agriculture. Wheat, barley and oats each play their separate parts in agriculture. Under present conditions it is more economic for Britain to import most of its wheat for milling, and to use much of its home-grown grain for feeding purposes. Barley has attained a great position owing to its suitability as a spring-sown corn, while oats fill in areas that are too wet for either of the other cereals. Leguminous plants, brassicas, potatoes, sugar beet and mangolds are the other chief crops grown in Great Britain, and each receives its meed of attention. As a finale, an outline is given of the position of seed stocks in Britain, with an indication of the improved varieties and strains that can now be produced by selection in existing stocks.

A final word of commendation must be given to Dr. Bell for his illustrations. These are presented in groups, each photograph being faced with a concise account of the crop to which the illustration refers, complete in itself, and giving a clear outline which obviates detailed reference to the text. Altogether, letterpress and illustrations alike combine in setting out a clear and concise account of present-day cultivated farm plants in Britain, and the way they are adapted to fit in with the national economy.

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## THE CASE AGAINST DARWINISM

### Darwin, Before and After

The Story of Evolution. By Robert E. D. Clark. (Second Thoughts Library No. 1.) Pp. 192. (London: Paternoster Press, 1948.) 6s.

THAT Darwin's particular hypothesis of natural selection operating upon small and random variations is incapable by itself of explaining the evolution of living organisms would be admitted even by Dr. Julian Huxley. That its widespread acceptance and exaggeration did grievous harm to the racial and political life of mankind is an easily arguable thesis. Dr. R. E. D. Clark in the present volume goes much further than either of these statements. He sets himself to denounce the whole concept of creative evolution—"every theory of evolution", he concludes (p. 145), "has failed in the light of modern discovery"—and to demonstrate not only that the evidence is against it but also that it conflicts with the principle of entropy or, as he calls it, "morpholysis", upon which "not merely physics but all science depends" (p. 150). In so doing he begins with the Greeks, has hard things to say about Cudworth and Spinoza, describes the conflict over preformation and epigenesis and the coming of belief in the fixity of species, and so arrives at the fore-runners of Darwin. Then his study becomes more detailed. He makes much of Darwin's youthful vagaries, assigns to him psychological and religious conflicts, and treats his ill-health and his theory of evolution as the outcome of the sense of guilt. He describes somewhat confusedly the publication of the "Origin of Species" and the causes of its influence; and in a vigorous chapter entitled "Good Squib" makes it responsible for irreligion and 'big business', for racial oppression and the glorification of war, for Marx and Nietzsche, Hitler and Mussolini. Finally, he devotes two chapters to showing that evolution is contrary both to biological science and to physics, and a final one to qualifying much of what he has previously said by drawing a distinction between two uses of the word evolution, whereby he admits abundant evidence that "over long periods of time species undergo changes" but argues that this does not involve any ultimate increase in complexity.

If such a summary seems to bring out little that deserves attention, it is fair to add that Dr. Clark writes not only with vigour and conviction but also with real knowledge and often with justification. Many of his points are soundly and shrewdly argued; many of his criticisms are justifiable. Unfortunately, he overstates his arguments so much as to produce manifest inconsistencies—compare the condemnation of 'preformation' on p. 144 with the praise of it on pp. 26 and 183, or the insistence upon disorder on p. 151 with that upon order on p. 153.