

Our own inheritance

Ben Carritt

Human Genetics. By Elof Axel Carlson. D.C. Heath: 1984. Pp.432. \$27.95.
Patterns of Human Heredity: An Introduction to Human Genetics. By James R. Brennan. Prentice-Hall: 1984. Pp.340. \$35, £31.90.

IT SHOULD not be imagined that a reviewer's heart beats faster with the arrival of a book based on a one-term course for non-science students. Moreover, chapter headings such as "Reflections on the Human Condition" (Carlson's first) fill the cynical and hard-bitten experimentalist with dread. And in Britain, where the contribution of science faculties to liberal studies teaching is negligible, it is tempting to dismiss such books as an irrelevancy. I was therefore pleasantly surprised by how much I enjoyed reading the first of the two reviewed here.

Carlson's *Human Genetics* is indeed intended as an introductory text for students with "no prior science course work", and the treatment of many important areas is therefore necessarily superficial. In some cases, additional depth is provided in the form of extensive legends to the excellent figures, and in others the details are contained in tables. At times, this device deprives the author of the space to explain his point with sufficient clarity: it also tends to give the impression that the transmission of scientific knowledge is not the primary purpose of the book. In a sense, it would be as well if this were the case, because viewed strictly as a genetics text it can be faulted. I thought, for example, that the coverage of chromosome abnormalities was too sketchy, and that there was too

much developmental biology. Neither could I see the reason for inserting an account of radiation damage as the third chapter when mutation is not covered until much later on.

Yet this is an immensely readable book, which seems to revel in the opening of controversy where almost any kind of biological principle is involved. IQ testing, the genetics of skin colour, the genetic basis of race and the "eugenics" programme of the Nazis are obvious inclusions, but there are many others besides. I particularly enjoyed the nuggets of useful statistical information, included in tabular form, such as the changing patterns of mortality, the causes of mental retardation in mental patients and so on.

Patterns of Human Heredity, aimed at a similar audience, is very much more a genetics text. The structure of the book is logical, proceeding through cell structure, DNA and chromosomes to Mendel, and then on to genetic diseases, polygenes and population genetics. The later sections of the book are well handled, particularly those which are mathematically based, such as polygenes and population genetics. One wonders, however, whether they might not be too advanced for a readership which is considered to be in need of the sort of detailed description of human reproduction which appears earlier in the book.

I found Brennan's use of language annoying and sometimes difficult to understand, but this may be a personal or a national difference in usage. Both he and Carlson provide review questions and summaries for each chapter — useful learning aids. Brennan also gives answers to his less discursive questions, which is helpful, if repetitive. □

Ben Carritt is in the Medical Research Council's Human Biochemical Genetics Unit, London.

Genetic similarities

D.J. Cove

Genetics, 2nd Edn.
By Charlotte J. Avers.
Willard Grant/Wadsworth: 1984.
Pp.644. \$27.50, £13.95.
Genetics, 3rd Edn.
By Ursula Goodenough.
Holt Saunders/Holt, Rinehart & Winston: 1984. Pp.894. Hbk £24.95, \$37.95; pbk £13.95.

THIS is the third opportunity I have had to review the annual crop of introductory genetics textbooks for *Nature* (see *Nature* 289, 702-704 (1981) and 295, 476-477 (1982) for earlier reviews) and I will not repeat here in detail my views on how I believe genetics teaching should cope with the integration of the classical concepts of the subject with the explosion of knowledge that has taken place as a result of

molecular analytical techniques. This year's books are new editions rather than new texts and so it would be surprising if either offered any radical change in its teaching strategy. Avers remains an example of the "Mendel before molecules" approach while Goodenough is a "Let's start with DNA" book. Although the two authors have adopted what at first sight appear to be completely different teaching strategies, these books illustrate clearly how such overall strategies are rather unimportant. Each contains a chapter on Mendelian inheritance and there is little difference between them. Both stick faithfully to history, introducing Mendelism with Mendel and so, like most other textbooks of genetics, the student is required to cope all at once not only with segregation but also with diploidy and dominance. Both texts give the initial impression that each gene is represented by only two alleles, one dominant to the other, although Avers introduces multiple alleles and incomplete dominance much sooner than

Goodenough. In both books, Mendelian genetics is set in a sealed compartment with little reference to modern knowledge of gene structure or function.

Population and evolutionary genetics are also treated similarly in both texts. The subjects are dealt with last, in another compartment almost like an embarrassing appendix. Set against the excitement of recent advances in genetics at the molecular level, it is now often difficult to interest students in population and evolutionary genetics even though these topics remain of central importance to the subject. The integration of these topics into the general body of genetics teaching is therefore crucial.

As is to be expected, the most significant changes which these two new editions incorporate is in the area of molecular genetics and both include an up-to-date account of modern techniques for the handling and analysis of DNA and of the findings to which these new techniques have led. Here Goodenough, building on the strength of the molecular and microbial side of her earlier editions, has the edge.

The treatment by both texts of the regulation of the use of genetic information and of the genetic programming of development remains anecdotal. Perhaps the most important principle to emerge out of the study of the regulation of gene expression is that general principles are sparse. The diversity of regulatory mechanisms involved in the control of metabolism is not stressed enough in either book, and, in both, developmental regulation consists of the best stories told in an unrelated manner. Here Avers, perhaps because she has less space, achieves slightly more integration. Except of course in the treatment of Mendelian genetics, neither book gives much space to plants. Avers in her table of the DNA content of "representative eukaryotic genomes" includes no green plant!

As our knowledge of genetics becomes more detailed, the subject becomes more challenging to teach especially in introductory courses. Conventional approaches become less satisfactory and integration more difficult since there is so much to be integrated. I believe that it is now best to begin such a course with a fairly complete but largely uncritical review of our current state of knowledge and then to deal with the experimental evidence which supports this overview, at the same time building flesh onto the initial skeleton. Neither of these texts adopt this approach. Both in fact offer us the same recipe as before and although they include all the necessary new ingredients the flavour is not much changed. If you liked either of these books before you should like the new editions more. If you are a first time buyer, however, I do not think they are among the best buys. □

D.J. Cove is Professor in the Department of Genetics at the University of Leeds.