

Grubb, Ph. W.: *Patents in Chemistry and Biotechnology*. Oxford: Clarendon Press 1986. VII, 335 pp., several figs. and tabs. Soft bound \$ 24.95.

Patent acts protect methods and lifeless products which meet the criteria of novelty, inventiveness, usefulness to industry, and reproducibility. Animal and plant varieties are not patentable in countries adhering to the European Patent Convention, although some exceptions do exist in the USA and Hungary. In the United Kingdom, The Netherlands and other European countries, plant varieties can be protected by the plant breeders' right, which is comparable to copyright. However, plant breeding companies wanting to improve a crop by using expensive genetic manipulation techniques insist on protecting their product (and investment) with a patent as it provides more extended protection than the breeders' right. Numerous discussions have recently been opened on this subject. On the other hand, a microbiological process, or the product of such a process, which may, for example, be a micro-organism obtained by artificial recombination, can be granted a patent.

The present book is the second edition of "*Patents for Chemists*." The title has been changed to "*Patents in Chemistry and Biotechnology*" because of the rapid growth of biotechnology as well as its commercial importance. The book contains 24 chapters, compiled in four parts. The first part treats the general principles of patents, gives some historical developments and future trends, and explains what can be patented, and in which way. Here, a remark is made on the exclusion of patents for animal and plant varieties. The second part concentrates on the details of inventions in chemistry, pharmaceuticals, and biotechnology, and their patents and commercial exploitation. It provides clear explanations of biotechnology and the "new biotechnology" (recombinant DNA technology) and indicates the two basic types of patentable inventions in this field, i.e., related to techniques, and to products, respectively. It answers the question of why patent conflicts are more common for recombinant DNA products than for "classical" pharmaceutical products. However, a discussion on the patentability of plant and animal varieties, when they are the products of genetic engineering, is unfortunately lacking in this part. Patents for the chemical inventor is described in the third part. Among other interesting aspects, this section explains about infringements, from the viewpoint of both the patentee and the infringer. In addition, details are supplied on patent descriptions as sources of technical information. For example, the British Patent Office uses a classification system of approximately 400 subject headings and publishes a guide to this system to ease patent searches. The fourth part of the book focuses attention on the political aspects of patents. The European Community, the United States, the socialist countries, and developing countries all have their own individual patent systems and patent protections according to political and economical status.

The book contains an extended list of contents, a list of abbreviations, a nine-page long and very useful glossary of patent terms and jargon, a list of cases referred to in the chapters, a list of patent journals, and a subject index. The text of this pleasantly readable book is clear, well-informed and enchaining. Therefore, its purchase by lawyers and laymen, by scientists and politicians, is highly recommended.

However, it is to be hoped that a possible subsequent edition of the book will be extended with interpretations and changes in the legislation on patenting of biotechnologically improved animals and plants.

L. J. W. Gilissen, Wageningen

Evolution. Entwicklungsprinzipien und menschliches Selbstverständnis in einer sich wandelnden Welt. St. Pölten: Niederösterreichisches Pressehaus 1985. 124 pp., 8 figs. ISBN 3-85326-781-5.

Forum St. Stephan, an association of Christian intellectuals in Vienna, convened a symposium under the above title, in which various aspects of evolution were considered in relation to their relevance to human understanding. This volume is the result of this symposium. There were eight speakers. After a short but sharp analysis of the terms "chance" and "natural law" by Ferschel (the concept of chance needs a critical reconstruction), cosmological evolution is outlined by Aichelburg and Kogerler, and Darwinian and non-Darwinian evolution are discussed by Pirchler. Illies argues for the usefulness of the term evolution for describing the development of human culture. Vollmer gives an elaborate and critical exposé on evolutionary epistemology.

Two theologians, Schoonenberg and Biser, discuss the relevance of evolution within their discipline. Since creationism is considered to be quite irrelevant in the German-speaking areas of Europe, these are mostly conciliatory, mildly deploring, extra-territorial excursions by either the faithful or the evolutionists (for such behaviour by evolutionists, see Mary Midgley's "*Evolution as a Religion*", Methuen, 1985). Although this reviewer does not wish to comment upon the strictly theological themes of creation and eschatology, he wishes to remark that both authors seem to take the standard neo-Darwinian orthodoxy at face value (this despite the fact that Biser quotes from Spämann and Löw). In addition, both men sympathise more (Biser) or less (Schoonenberg) with the ideas of Teilhard de Chardin, while still recognising, with the zoologist Portmann, that, at the critical junction, "the mystic has taken the pen out of the hand of the scientist". In the final paper, "Science as a challenge", by the physicist Eder, several areas of the sciences and humanities are challenged to come to grips with modern science. Eder expresses a confidence in science that is not often seen these days. This author also enters into discussion with other speakers, most notably Vollmer (most evolutionists are "Evolutionskinematiker") and Biser (Teilhardism is pantheism). Thus, the selfconfident physicist concurs with the orthodox philosopher, Maritain, who classified Teilhardism as a gnosis.

Geneticists wishing to recognise that one part of their academic task is to be aware of the coherence of sciences will be stimulated by this little book. The easy-going application of the term evolution, and the apparent success of this diversification makes evolution an example of what evolutionary theory means by "adaptive radiation". Being exemplary of oneself constitutes the danger for keeping oneself as self-explaining, hence self-justifiable, and therefore exempt from normal critical considerations.

J. F. G. M. Wintermans, Nijmegen

Emerich, U.; Gerwin, R. (eds.): Max-Planck-Gesellschaft Jahrbuch 1987. Vandenhoeck & Ruprecht: Göttingen 1987. 967 pp.; numerous figs. in colour and black-and-white. DM 88,00.

This yearbook of the most important organisation for pure scientific research in Western Germany summarises the spectrum of its scientific activity. In three sections, the organisation's activities in the biological-medical field, in the chemical-physical-technical field, and in Art science are presented. The yearbook begins with four very interesting general perspectives. These are followed by progress reports, including complete lists of the works published in 1987, by all the institutes and laboratories encompassed by this large organisation with 2,189 scientists (26% of the total work force), 3,612 visiting scientists from abroad, and a total yearly budget of 1.143 billion. Topics related to genetics can be found scattered fairly frequently throughout the progress reports, e.g. molecular biology, gene expression in eucaryotes, infection and immunogenetics, developmental biology, intercellular communication, neuronal gene expression, genetic basis of plant breeding, molecular breeding, and yield genetics. What is noticeable is the large number of special temporary research groups designed for the upcoming generation of researchers, who get a chance to demonstrate their capabilities. In general, this yearbook provides the reader with the opportunity of becoming informed on just what is occurring in the most liberal and best funded organisation in West Germany.

H. F. Linskens, Nijmegen

Batygina, T.B.: The Grain of Cereals, Atlas. Leningrad: NAUKA 1987. 104 pp.; 127 figs. of which 12 are color, 2 tabs.

This book, introduced by a two-sentence citation of N.I. Vavilov, is a nicely illustrated volume on the fertilization process and embryo-caryopse development of cereals. These systems of plant embryology provide the basis for the formation of food for human consumption. The atlas contains original drawings, and light and EM micrographs selected from various literature sources, although the majority are of Russian origin or come from the author himself. This is more than acceptable as the researchers of the Komarov Institute in Leningrad have greatly contributed to our understanding of the origin and development of the first stages of ontogenesis in grasses used as human food. A short description of the special embryonic processes which result in grass seeds is given, with emphasis on the development of the stamen, ovary, and embryo. In addition, embryonic processes such as male sterility, far distant hybridization, and effects of external factors on the formation of reproductive organs is documented with words and pictures. Embryo culture, the long-term preservation of pollen, and viability tests are covered from the methodological point of view. The "Atlas" is directed towards plant breeders and selectionists because the author believes that a better knowledge of embryonic processes and the laws of morphogenesis is a prerequisite for more efficient breeding procedures.

For readers lacking some proficiency in the Russian language, there is a four page introduction in English as well as an English table of contents. Apparently, the Russian embryologist can still handle a pencil with fine results while using the light microscope, whereas a few of the micrographs should either have been eliminated or better reproduced. The whole volume is printed on glossy paper, indicating the progress of Russian printing techniques. The monograph is edited by M.S. Yakovlev, one of the great old men of Russian plant embryology, and has a list of 277 references, nearly half of them in English.

H. F. Linskens, Nijmegen

Nagl, W.: Gentechnologie und Grenzen der Biologie. Dimensionen der modernen Biologie, Band 1. Darmstadt: Wissenschaftliche Buchgesellschaft 1987. 210 pp., 46 figs., 5 tabs. Hard bound DM 39,00.

The term "genetic engineering" has become well-known by the general public who often discuss it in an excited and subjective way. In providing detailed and accurate information on the chances and risks involved in this field, as well as its technical and ethical limits, W. Nagl attempts to discuss this topic objectively.

In seven chapters, his book, Genetic Engineering and the Limits of Biology, (written in German) describes a historical overview of biology, the organization of the eukaryotic genome, common methods of genetic engineering accompanied by some detailed protocols, the application of genetic engineering in industry, agriculture, zoology and medicine, the limits of genetic engineering, and an outlook on the future. The chapters, written in an easy-to-understand style, are clearly articulated and, where necessary, embellished by figures, quotations from well-known persons, and essays written by students. Although the author takes the definite position that genetic engineering is necessary to science, even a non-scientific reader will feel that he is receiving extensive and objective information on the chances, risks, and limits of this technology.

This book is very appropriate to anyone, whether scientist or non-scientist, who wants to reflect upon his own opinion about genetic engineering. However, the chapter describing some detailed protocols of methods, like a laboratory manual, is unnecessary and serves only to confuse those readers with non-specialized knowledge. The comprehensive list of references allows those readers who become more interested to search for further circumstantial information about genetic engineering and its problems.

K. Döhler, Bayreuth

Matthews, S. (ed.): Advances in Research and Technology of Seeds. Part 11. Wageningen: PUDOC 1988. 112 pp. Soft bound Dfl. 45.00.

The final edition of this commendable series from the International Seed Testing Association once more contains four important reviews: herbage seed production (J.G. Hampton), seed vigour and field establishment (A.A. Powell), mobilisation of reserves during germination (A.C. Slaughter), and seeds of woody plants (F.T. Bonner). Although its primary purpose is to familiarise seed scientists and technologists with the most recent literature and progress in this wide field, this series has always had some bearing on breeding. Thus, in this last issue, useful information on breeding for seed production, detection of differences in seed vigour, and seed orchard production, as well as complete reference lists, is available.

The termination of this series "because there are now many abstracting journals and ways of scanning literature" should serve as a warning to similar undertakings: data banks and terminals are menacing the traditional ways of publishing and reading. It may even be possible that future generations of scientists never will become familiar with printed pages – the turning over of a leaf, the search for references. Be that as it may, seed biologists today should be grateful to the generation of reviewers who, as in "Advances in Research and Technology of Seeds", delivered more than just references, but critical and annotated opinions, evaluations of advances, and suggestions for future research.

H. F. Linskens, Nijmegen

Sterba, G.: Süßwasserfische der Welt. Stuttgart: Ulmer 1987. 915 pp., 1425 photographs; 526 drawings, 73 maps. Hard bound DM 128,00.

This excellent illustrated work has been available since 1959, and with the publication of a new edition, its well-deserved position as an aquatic standard reference book is reaffirmed, although both editions have no direct implications on the breeding of fish for consumption purposes. The volume is an encyclopedia of the freshwater fishes of the world, and this latest edition includes up-to-date information on the extension and rearrangement of several groups. More than 2,000 species are described in detail. The present state of ichthyological research is described, and the most recent information on aquatics and the taxonomy of freshwater fishes is provided. For breeders of aquatic species, it must be considered a standard reference book. The price is remarkably low considering the quality of the printing and its layout. This may be due to the fact that it is a licence edition of the Urania Publishers.

H. F. Linskens, Nijmegen

Herzog, H.: Source and Sink During the Reproductive Period of Wheat. Development and its Regulation with Special Reference to Cytokinins. Advances in Agronomy and Crop Science, Vol. 8. Berlin, Hamburg: Parey 1987. 104 pp., 43 figs., 14 tabs. Soft bound \$ 29.00.

The author summarizes more than ten years of experimental work and describes our present knowledge on the developmental steps involved in yield formation during the caryopse development of wheat. Emphasis has been given to the development of source and sink, and its regulation by both external factors and such internal factors as phytohormones. Whereas the photosynthetic capacity of the flag leaf as an indicator of plant source capacity receives detailed treatment, transport phenomena in the flowers is neglected, perhaps due to the size of the grass flower. The author distinguishes between a current source and a buffer-source during the reproductive period. Strangely enough, genetical aspects, which are crucial for the translation of the findings into a breeding program, are absent from this book. For the rest, it is an excellent monograph on the "yield potential" of wheat, whatever that may be.

H. F. Linskens, Nijmegen

Denkewitz, L.: Heidegärten. Stuttgart: Ulmer 1987. 356 pp., 69 color photographs, 39 drawings. Hard bound DM 128,-.

There are only a few plant breeders, and these very daring, who venture into heather breeding. For decades, heather gardens have been familiar sights in England and the Netherlands and are now becoming increasingly popular. The heath-

er plant is no longer only the potted plant on graves on All Soul's Day. The heather garden can be ever flowering, displaying spectacular colours the whole year round. This is due both to the many species and varieties of the genera of the more common Ericaceae family, like *Calluna* and *Erica*, which possess vivacious colours, and also to the more rare genera of *Andromeda*, *Arctostaphylus*, *Cassiope*, *Empetrum*, *Ledum*, *Vaccinium*, and others.

Two chapters of this wonderful book are of interest to anyone wanting to know more about this up-and-coming ornamental: the chapter on hybrid heath and the one on the origin of new heather varieties. Both demonstrate that heather breeding is a field that needs to be opened up. The chapter on hybrid heather describes in detail *Erica* × *darleyensis*, × *stuartii*, × *watsonii*, and × *williamsii*. Most of these originated spontaneously in Ireland and on the English peninsulas of Pirbeck and Lizard. There are only a few synthetic hybrid species, most of which appeared on natural biotops without the interference of man. Man is, in heather breeding, only the discoverer, not the manipulator. Apparently, natural mutations (especially in the genus *Calluna*) are common: on the Scottish island of St. Kilda dwarf forms have developed and been maintained by isolation. For commercial gardeners, the filled double flowers and variation in leaf colour are of interest. In some varieties, a series of mutations are responsible. This was found to be the case in a variety discovered by H.E. Beale in 1925: subsequent mutations produced varieties with intensified colours, variegated and yellowing leaves, and very large flowers. The reason for the high degree of mutability found in *Calluna vulgaris* is largely unknown. Experts suppose that a certain genetic instability provides, under various environmental conditions such as radiation, wind exposure and extreme soil conditions, the observed variations. Interestingly enough, the plants with filled flowers are sterile and have to be propagated vegetatively; not so the spontaneously generated variegated leafed forms. There is an open field for future heather breeders according to the author: up to now no directed breeding programme has been started.

The book is additionally an excellent handbook for all the problems of heather culture, arrangement of heather rock gardens and parks, and pot culture. Heather can even be used in roof gardens and balconies. This monograph provides detailed information on the construction and maintenance of heather gardens, their propagation, and on combining them with species like rhododendrons, grasses, perennials and wood plants. The Appendix provides a wealth of information: the occurrence of the most important heather species in Europe, heather gardens worth seeing in Germany, England and the Netherlands, and information and addresses about horticultural firms specialising in heather production.

This book is an excellent successor to the older monographs (1972) of both Underhill and Gimingham on the ecology of heathlands.

H. F. Linskens, Nijmegen