cerning the biochemical and physiological basis for the recognition process which precedes 'mating' of micro-organisms such as bacteria, algae and fungi.

I hope that these comments illustrate the very wide scope and interest of this attractively produced handbook. Certainly it serves as a valuable and accessible introduction to the recent literature on these topics (although, of course, all the fields are expanding very rapidly) and on the whole is clearly written. One could obviously quibble with the necessary omissions that have had to be made, and with the rather large number of typographical errors that have slipped through. Yet I think that the paperback version at £ 6 will prove to have wide appeal for biological scientists and perhaps also to postgraduates who wish to keep abreast of developments in the field of cell–cell communication.

J. R. S. Hoult

Living Systems as Energy Converters

Edited by R. Buvet, M. J. Allen and J.-P. Massue
North-Holland; Amsterdam, Oxford, New York, 1977
x + 347 pages. Dfl 72.00, $ 29.50

This text documents the impending threat to mankind's survival on earth as pressures on renewable energy resources mount and the limited supplies of fossil fuels dwindle at an accelerating pace. Certainly, by the turn of this century, a life style sustained by the profligate consumption of energy will have largely disappeared. It is also clear that alternative sources of, so-called, high-grade forms of energy will have to be developed before then simply to meet the minimal demands of the present population let alone the population projected on present demographic trends.

The aim of the work is to review current research into the way biological systems harness and utilise energy for their own purposes and to identify those processes that could be developed to provide useful forms of high-grade energy on a commercial scale. The book originates from a meeting held under the auspices of the Parliamentary Assembly of the Council of Europe in collaboration with the Commission of European Communities and consists of 25 chapters each contributed by a participant of the meeting. The text is divided into three sections of about equal length, dealing with energy in biological molecules, biological membranes as energy transducers and energy in cells, organisms and populations. The theme is established in an excellent introduction by G. Porter and useful résumés are included at the end of each section.

The progress to date in our understanding of energy conversions that take place in biological systems such as the photolysis of water, the evolution of hydrogen and oxidative phosphorylation is impressive but there is still some distance to go before the precise mechanisms are fully resolved. Attempts to derive high-grade energy in the form of hydrogen gas from photosynthetic systems coupled to iron–sulphur hydrogenase are reported but many problems remain especially in achieving stable and productive systems. Understandably much space is devoted to energy conversions involved in photosynthesis, indeed there is a considerable overlap in the treatment of this topic. Diagrams illustrating electron transfers in photosynthesis, for example, feature on no less than six occasions throughout the text. Despite this, and the emphasis that is placed upon the efficiency with which radiant energy is transduced in the photosynthetic process, no mention is made of photorespiration which is often responsible for considerable reductions in net yield particularly in plants that fix carbon dioxide by the C_3 Calvin cycle.

An often expressed criticism of multi-author works of this type is the unevenness of presentation and this book is not exceptional in this regard. Possibly stronger editorial intervention could have helped in matters like the standardisation of units according to the S.I.

convention and the elimination of misspellings; I encountered three versions of stoichiometry. Apart from these shortcomings the book is a must for directors responsible for allocating resources for research aimed at developing alternative energy sources because biological systems offer great promise. Research workers in this and related fields will also find this book a welcome and timely addition to the literature.

P. J. Quinn

Biochemistry of Photosynthesis (2nd edition)

by Richard P. F. Gregory
John Wiley and Sons; Chichester, 1977
xiv + 221 pages. £ 8.50, $ 16.50

Having reviewed the first edition of this book some 5 years ago for *Nature* (1972, 236, 298.) it is a pleasure to read it again and see how the author has kept up with the field and also presented the latest ideas so well. It is a difficult task to present the biochemical aspects of photosynthesis in about 200 pages but it is done admirably with a wealth of figures, diagrams and tables. The book is well suited for advanced undergraduate and postgraduate courses in photosynthesis and the plant sciences.

Part one of the book deals with the absorption of light and its conversion into chemical energy explaining the electron transport system in detail. The path of carbon in its three main variations is then presented. This part sets the scene for part two where photosynthetic electron transport via the photosystems and its accompanying phosphorylation reactions are correlated with the structure of the thylakoid membranes. Considerable coverage is also given to the relationship between the metabolism of the chloroplast and that of the cell. The importance of this aspect of photosynthesis has only recently been recognised and is well treated in the book.

In appendices a set of numerical problems is given (with the answers later!) as well as a list of topics for class or tutorial discussion. There are over 200 references – both modern and 'classic'. The author and subject indices would not disgrace much more comprehensive treatises.

The combination of topics, presentation, figures, references and indices make this book a 'good buy' for more advanced students and their teachers.

D. O. Hall

Plant Biophysics

(translated from Russian)

Edited by D. M. Grodzinskii
Israel Program for Scientific Translations; Jerusalem, 1976
John Wiley and Sons; Chichester
ix + 236 pages. £ 18.95, $ 32.00

In photosynthetic bacteria, the process takes place where chlorophyll or a related pigment is embedded in the plasma membrane. The oxygen and water produced in photosynthesis exit through the stomata. Key Takeaways.Â What Is Not a Product of Photosynthesis? If you're asked about photosynthesis on a test, you may be asked to identify the products of the reaction. That's pretty easy, right? Another form of the question is to ask what is not a product of photosynthesis.

The biochemistry of photosynthesis is broken down into two cycles. The Light-Dependent Reactions (the Photo part of photosynthesis), takes place in the thylakoid membrane. Itâ€™s during these reactions where photons interact with chlorophyll, allowing their energy to be converted into chemical energy for later, in the forms of ATP, and NADPH. During this process, Oxygen (O2) is released into the atmosphere as a leftover byproduct after extracting an electron from water (H2O). Photosynthesis is a process used by plants and other organisms to convert light energy into chemical energy that can later be released to fuel the organisms' activities. This chemical energy is stored in carbohydrate molecules, such as sugars, which are synthesized from carbon dioxide and water â€“ hence the name photosynthesis, from the Greek phÅs (Ï†á¿¶Ï‚), "light", and sunthesis (ÏƒÏÎ½Î¸ÎµÏƒÎ¹Ï‚), "putting together". In most cases, oxygen is also released as a waste product. Most plants, most algae, and Photosynthesis is the process by which plants, some bacteria and some protistans use the energy from sunlight to produce glucose from carbon dioxide and water. This glucose can be converted into pyruvate which releases adenosine triphosphate (ATP) by cellular respiration. Oxygen is also formed. Photosynthesis may be summarised by the word equation: carbon dioxide + water. glucose + oxygen. To know that photosynthesis can convert light energy into chemical energy. To understand how the light reactions convert solar energy into ATP and NADPH. To understand that the Calvin cycle uses the chemical energy of ATP and NADPH produced in the light reactions to reduce CO2 to sugar. To understand the relationships between cellular respiration and photosynthesis. Session Activities. Lecture Video. Watch the lecture video excerpt. Photosynthesis (00:17:02).