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 hand-
book. 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 omis-
sions 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 man-
kind'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 popu-
lation 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 mecha-
nisms 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. Understand-
ably much space is devoted to energy conversions
involved in photosynthesis, indeed there is a consider-
able overlap in the treatment of this topic. Diagrams
illustrating electron transfers in photosynthesis, for
example, feature on no less than six occasions through-
out the text. Despite this, and the emphasis that is
placed upon the efficiency with which radiant energy
is transduced in the photosynthetic process, no men-
tion is made of photorespiration which is often respon-
sible for considerable reductions in net yield particu-
larly in plants that fix carbon dioxide by the C3
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
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 — hence the name photosynthesis, from the Greek φῶς, “light”, and σύνθεσις, “putting together”. In most cases, oxygen is also released as a waste product. Most plants, most algae, and Photosynthesis: Photobiochemistry and Photobiophysics is the first single-authored book in the Advances in Photosynthesis Series. It provides an overview of the light reactions and electron transfers in both oxygenic and anoxygenic photosynthesis. The scope of the book is characterized by the time frame in which the light reactions and the subsequent electron transfers take place, namely between $\leq 10^{-12}$ second and $\geq 10^{-3}$ second. Photosynthesis is the biochemical pathway which converts the energy of light into the bonds of glucose molecules. The process of photosynthesis occurs in two steps. Photosynthesis Equation. $6 \text{CO}_2 + 6 \text{H}_2\text{O} + \text{Light} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2 + 6 \text{H}_2\text{O}$. Above is the overall reaction for photosynthesis. Using the energy from light and the hydrogens and electrons from water, the plant combines the carbons found in carbon dioxide into more complex molecules.