enhancements observed in this study are significant and promise to be applicable to a variety of problems. For example, in mobile systems[11] that do not cross polarize efficiently, single-pulse experiments with NOE enhancement could be a superior alternative. NOE measurements in solids may also be useful for probing high-frequency motions, for studying relaxation mechanisms and pathways, and for spectral assignments.

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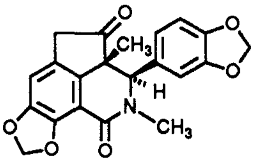
[11] Haw, J. F.; Richardson, B. R.; Oshiro. I. S.; Lazo, N. D.; Speed, J. A. *J. Am. Chem. Soc.* **1989**, *111*, 2052.

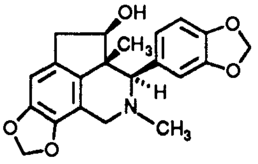
Additions and Corrections

Total Synthesis of (±)-14-Epicorynoline, (±)-Corynoline, and (±)-6-Oxocorynoline [*J. Am. Chem. Soc.* **1983**, *105*, 2873]. MARK CUSHMAN,* AZIZ ABBASPOUR, and YASH PAL GUPTA

In 1988, the isolation and characterization of 13-epicorynoline was reported (Zeng, W.; Liang, W.; He, C.; Zheng, Q.; Tu, G. *Phytochemistry* **1988**, *27*, 599). The spectroscopic data of this natural product did not match that of our earlier prepared synthetic compound **31**, which had been assigned a structure identical with that of 13-epicorynoline. An X-ray analysis of **31** has indicated that the previously assigned structure is incorrect. Since **31** was prepared by $LiAlH_4$ reduction of **30**, structure **30** as given in the publication is also incorrect. The correct structures of **30** and **31** are shown below. Since these compounds were not on the synthetic pathway to the natural products listed in the title, the synthesis of the title compounds is still valid.



30



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Book Reviews

Second Quantized Approach to Quantum Chemistry. An Elementary Introduction. By P. R. Surjân (Chinoin Pharmaceutical and Chemical Works Ltd.). Springer-Verlag: New York and Berlin. 1989. xii + 184 pp. $79.50. ISBN 0-387-51137-7.

The purpose of this book is to make the second-quantized approach accessible to chemists. By discussing a number of topics that ordinarily are not encountered in a standard course of quantum chemistry, Surjân helps to bridge the gap between chemists and physicists. However, this is a very thin book that should be a bit thicker.

Surjân assumes that the reader is familiar with basic quantum mechanics and has a good working knowledge of quantum chemistry, including σ–π separation, Hückel theory, spin orbitals, antisymmetrization, Slater determinants, the Slater–Condon rules, Hartree–Fock theory, and projection operators. Chapters 1–5 introduce the particle-number representation, creation and annihilation operators (and their anticommutation relations), particle-number operators, the second-quantized representation of operators, and the evaluation of matrix elements. The particle-hole formalism is introduced, although it is not used in the book. These chapters are rather terse; additional explanation would be very useful in several places. However, most students should be able to work through them and thereby obtain a working grasp of the second-quantized approach.

The remainder of the book purportedly shows the utility of second quantization in treating a number of chemical problems. In most cases the author is content to develop equations, without much explanation of their significance.

Some parts of the book are confusing, probably because of the author's brevity. At the end of Chapter 8, Surjân shows that the use of incomplete basis sets leads to some mathematical inconsistencies. However, the reader is told nothing about their practical consequences, or how to get around them in actual calculations. In Section 10.4, students will be confused by the sudden insertion of extra electron-interaction terms to convert the electronic Hamiltonian into the Fockian. The discussion of quasi-particle transformations in Chapter 16 contains too many gaps to be very useful to inexperienced readers.

The book contains some inconsistencies. In Chapter 7, Surjân employs commutators rather than anticommutators for Fermion creation and annihilation operators. In developing the second-order density matrix, he uses a unitary transformation between basis functions and Hartree–Fock orbitals. This implies that the creation and annihilation operators for the latter anticommute, just like those for the basis functions. However, the desired result cannot be obtained by using that anticommutation. The development of the Brillouin theorem in Chapter 11 is confusing because basis functions and Hartree–Fock eigenfunctions are not differentiated.

Several chapters are quite interesting. Chapter 10 shows that second quantization provides a very neat path to the particle-hole symmetry relations in alternant π-electron systems. Chapter 13 is a concise discussion of the difficulties encountered with non-orthogonal basis sets. The chapters on the Hellmann–Feynmann theorem and intermolecular interactions are really thought-provoking. Unfortunately, not enough space is devoted to any topic. However, the careful reader will gain a modicum of familiarity with second quantization, and may then be able to understand papers where more complete discussions are given.

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Laser Micro Analysis. By L. Moenke-Blankenburg (Martin-Luther-University). Wiley-Interscience: New York and Chichester. 1989. xvi + 288 pp. $69.95. ISBN 0-471-63707-6.

This monograph (Volume 105 in the Chemical Analysis series of monographs) discusses the use of laser-based techniques for analysis of materials, with the term micro implying the emphasis on high-spatial resolution through the use of tightly focused laser beams. The principal methods discussed are optical emission spectroscopy and mass spectrometry. The most sensitive of these methods can provide ppm detection limits while using only picograms of the sample. These analytical methods, coupled with laser excitation, are illustrated through a large number of referenced applications (tabulated references make up one-third of the book). The broad overview of this important topic will be useful to most beginning practitioners, while the detailed lists and tables