national characteristics.) Difficulties have inevitably arisen from the variations in the organization of academic research from country to country, as is evident from the absence of information for many major CNRS (France) and CNR (Italy) centres; thus, for example, the reader will look in vain for information about R. Corriu (CNRS, Montpelier) and J. Satgé (CNRS, Toulouse), or A. Alberti and G. Seconi (CNR, Ozzano-Emilia.)

There is an interesting Statistical Survey, giving the numbers of staff, post-doctoral fellows, and enrolled graduates, and of master's and doctoral level degrees awarded in 1980/81 or 1981/82. The data stimulate speculation and provide some puzzles. For example, in Australia the Flinders University apparently had a graduate enrollment of only 5 in September 1982, but produced 1 master's and 4 doctoral level degrees in 1981/82, whereas Monash, with a corresponding graduate enrollment of 60, produced only 2 master's and 6 doctoral level graduates. Again, in West Germany the University of Stuttgart, with a graduate enrollment of 124, produced a total of 107 master's or doctoral level graduates, whereas the Johan Wolfgang Goethe University of Frankfurt am Main, with a graduate enrollment of 657, produced only 59 such graduates. In Switzerland, the University of Basel, with a graduate enrollment of only 62, produced a total of 57 master's or doctoral level graduates.

In spite of the limitations mentioned, this is a very valuable reference book, and I have already made considerable use of it in the few weeks it has been in my hands. All advanced chemistry students should have access to it. I suspect that later editions will be even more valuable, because institutions which did not send in information for this one will realize how unwise they were.

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Inorganic Chemistry. Topics in Current Chemistry 124; edited by F.L. Boschke, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1984. vii + 138 pages, DM 68. ISBN 3-540-13534-0.

The title of this volume, "Inorganic Chemistry", is scarcely informative about its contents, which consist of three reviews: the problems for the two-electron bond in inorganic compounds; analysis of the coordination number *N* (Ch. K. Jørgensen; 31 pages, 125 refs.), cationic and anionic complexes of the noble gases (H. Selig and J.H. Holloway; 58 pages, 172 refs.), and extraction of metals from sea water (K. Schwochau; 43 pages, 166 refs.). These will now be considered in reverse order.

Remarkably, some eighty elements have been detected in sea water to date, at molar concentrations differing by more than twenty orders of magnitude; open ocean water contains 33—37 g l^{-1} of dissolved salts, but 99.5% of these consist of Na^+, K^+, Mg^{2+}, Ca^{2+}, Cl^- and $[SO_4]^{2-}$. Schwochau's review of the extraction of metals from sea water concentrates upon methods which are based upon complex formation, and is very concisely written; unfortunately, of the many metals discussed, only the four metals mentioned above are recovered in commercial quantities, and strontium is the only other metal which might conceivably be profitable.

Selig and Holloway have written a fascinating, comprehensive, detailed and readable review of the cationic and anionic complexes of the noble gases, and the compounds featured include $[Xe_2]^+$, $[EF]^+$ (E = Ar, Kr, Xe or Rn), $[E_2F_3]^+$ (E = Kr or Xe), $[XeF_3]^+$, $[XeF_5]^+$, $[Xe_2F_{11}]^+$, $[XeOF_3]^+$, $[XeO_2F]^+$, $[XeOF_5]^+$, $[XeOTeF_5]^+$, $[\{FXeO\}_2S(O)F]^+$, $[\{(FO_2S)_2NXe\}_2F]^+$, $[XeF_8]^{2-}$, $[XeF_7]^-$, $[XeOF_5]^-$, $[Xe_3O_3F_{13}]^-$, $[XeO_3X]$ (Y = F, Cl or Br), $[XeOF_3]^-$ and $[XeO_2F_3]^-$. Undoubtedly the most unusual of these compounds is $[Xe_2]^+$, a green mixed-valence, xenon—xenon bonded ion.

Excellent though the above reviews are, the article by Jørgensen is an outstanding, thought-provoking and stimulating discussion which should be compulsory reading for all inorganic chemists: if this volume only contained this one article, it would be more than worth its price. Jørgensen's style is unique (indeed Jørgensen himself is unique), and to capture its flavour, the following quotations are reproduced from his considerations of the validity of the two-electron bond concept: "If need be, adult chemists can certainly survive without the Lewis paradigm", "There is no physical basis for the view that there are two separately localised pairs of non-bonded electrons in H_2O", "The hybridisation model was a refreshing innovation, when it was made by Pauling in 1931, but the commentators in text-books have gone very far along a sterile scholastic desert trail", and "It is a stress for many chemists not to possess a fixed set of axioms and a rounded-off fundament for everything, and they are willing to accept an imitation lasting for their life-time. After all, many people prefer Khomeiny rather than Hamlet". I defy even the most narrow-minded chemist to read this polemic, and then to describe methane as containing four idential sp^3 hybrid orbitals, without feeling the uneasy pangs of a guilty conscience. Jørgensen is one of the few free thinkers in chemistry today — contributions of this calibre are truly invaluable. This book should be in every chemistry library that exists, and should be available to undergraduates and postgraduates as a caveat not to believe everything they read in text-books or hear in lectures.

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