

PREFACE

In the course of editing this volume I discovered that I am temperamentally unsuited to the task, an impediment that in no small way accounts for the fact that its publication is later than I would have hoped or anticipated. I am, at heart, a pedant, particularly with respect to the use and abuse of the English language. Many of my scientific colleagues are a good deal less punctilious; they take the reasonable view that if the message is clear, the manner of expression is unimportant. Experience has taught me that what is clear to the author is often quite unclear to the reader unless the author takes the trouble to express himself with precision. I have also found that most scientists are unwilling to devote to the presentation of their results the care that they lavish on obtaining them. But I found myself slipping beyond this often justifiable complaint into a state of inexcusable self-righteousness.

It began innocently enough. Conscious of the need for speed, I read the first two or three texts with murmurs of approval, and scribbled 'no changes needed' on the title page of the copy. Then I began to notice one or two grammatical mistakes, plural verbs with singular nouns, mixtures of tenses, and so on, which had to be corrected; not serious, I told myself, a matter only of changing a word here, retyping a line there. Quickly I sank deeper. Sentences were reversed to provide clearer or less clumsy expression. Repetitive chunks were cut out. Unsatisfying idiom was frowned upon and altered. Colloquialisms were ruthlessly expunged. Soon red ink flowed like blood upon the pages. The massacre gathered momentum. I spent hours in the library immersed in Fowler. Whole mornings were devoted to the difference between 'that' and 'which'; sadly, it remained as before, clear in Mr. Fowler's mind but not in mine. I wallowed in the distinctions between 'shall' and 'will' and between 'should' and 'would.' I became embroiled in unresolved arguments over the merits of fused participles. I was like a pyromaniac let loose in a napalm factory, overwhelmed by the possibilities for destruction. Every comma was subjected to vicious scrutiny; some were removed, then replaced, then removed again in endless agonising. Colons and semi-colons were thrust upon unwilling prose. Texts were retyped in dozens. I was reviled by secretaries. All this without a word to the innocent victims, the authors, who were going blissfully about their daily business secure in the knowledge that publication was proceeding smoothly. Time, I told myself, did not permit; God did not create the world in six days by engaging in consultations. *Mea culpa.*

So, I offer my apologies to those of you who do not recognise what

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you have written. To the others go my regrets for the delay. My only excuse is that I did what I did for the common good, by keeping in mind the lonely reader in Ulan Bator who does not speak the NRAO jargon. I made every effort not to alter the scientific sense of what was said, and in fact avoided altering passages that no amount of rereading could help me understand.

The order of presentation of articles in this book is not the order in which papers were presented at the Symposium itself. The reasons are twofold: first, it was agreed that the volume should include the poster papers that were such a prominent and gratifying part of the Symposium; second, there were a number of late papers presented, not all of which fitted the context of the session to which time and convenience constrained them. For those who are interested, the programme for the Symposium is included elsewhere in this volume.

At first I tried to arrange the contents of this book into clearly defined sections. I quickly gave up. As is common in astronomy, my material defied attempts to divide and simplify it. Instead it presented itself as a prism spectrum, wherein the individual colours were obvious but the boundaries between them were not. I have avoided arbitrary division by arranging the articles so that each, where possible, follows from the preceding; there are obvious groupings within this continuum that are readily identifiable with various areas of research.

The question period that followed each talk was recorded in two forms: on tape, by means of a fearsome-looking parabolic microphone, for which we are grateful to the Canadian Broadcasting Corporation who loaned it to us on the understanding that it be returned in time for the next Ottawa Rough Rider football game; and in written form, each questioner being asked to paraphrase his question after the event, and each speaker to render once more his response. The comparison between written and recorded forms was often interesting. We also accepted questions in writing that shortness of time precluded in verbal form. On the other hand some questions have been omitted because they are answered in the published version of the talk or because they relate to diagrams that are not included in the published version. Finally I rearranged many of the questions in what seemed to me a more logical order than that in which they occurred.

In the Preface to the Proceedings of Symposium No. 90 my colleagues Ian Halliday and Bruce McIntosh write that they did not abdicate their responsibility to summarise the Symposium, but instead transferred it to a worthy recipient, Peter Millman. I, braver than they, have no such qualms. I abdicate my responsibility, resoundingly, fearlessly, and without heavy heart; partly because I was too busy locally organising while at the Symposium to hear much of what was going on, and too preoccupied to understand much of what I did hear; partly because the mind, while editing, tends to absorb words without digesting their meaning; but mostly because I have no insights to offer. I have the

feeling that at Symposium No. 87 the tide of scientific progress flowed inexorably forward, making obvious headway without engulfing any familiar landmarks.

The Symposium itself had its roots in the decision in 1976 to hold the XVII General Assembly of the IAU in Montreal. There was a general feeling at the Herzberg Institute of Astrophysics that we ought to 'do something' appropriate to the occasion. A symposium was the ready answer, and a symposium on interstellar molecules was clearly apt, since just two years previously the Herzberg Institute had been established with interstellar spectroscopy very much in mind, combining as it did the diverse astronomical and laboratory spectroscopic interests of the National Research Council. The permission of the IAU was sought and granted.

Symposium No. 87 on Interstellar Molecules lasted five days, had two hundred and twenty participants, plus wives, children, and travelling companions, nine sessions, twenty-one invited talks, forty-eight presented papers, about seventy poster papers, a round table discussion, and several papers submitted to the Proceedings that would have been posted had the authors only been able to attend the Symposium. Luckily for everyone's sanity the organisers chose to hold the event in relaxing surroundings at a resort hotel in the scenic Laurentian Mountains. Several members of the Local Organising Committee found it an agreeable part of their duties to investigate in detail the competing attractions of the various resort sites throughout Québec and Ontario. It was their good fortune to choose Mont Tremblant Lodge, and thanks are due to its management and staff, who far exceeded the level of hospitality and efficiency that might reasonably have been expected. Legion are the astronomers who pushed themselves from the dinner table glassy-eyed but smiling beatifically.

Obviously, in an undertaking of this size there are many to thank, all of whose contributions were invaluable. The members of the Local and Scientific Organising Committees were, of course, a *sine qua non*. Their names are listed elsewhere in these preliminary pages. They all contributed eagerly, but I hope the other members of the Scientific Committee will forgive me if I single out the Chairman, Professor Charles Townes, for particular mention; he did a mountain of work in drawing up the scientific programme, inviting the speakers, and fitting together the contributed papers, and it is due in no small part to his insight, breadth of knowledge, and tactfulness that the Symposium was the scientific success that most participants seemed to feel that it was. On the social and administrative sides of affairs we managed to avoid disasters, and as Chairman of the Local Committee I can testify to the enthusiasm and devotion to duty of each of the members, without whom all plans would have been as dust in the wind. We enjoyed the financial and moral support of Natural Sciences and Engineering Research Council of Canada, the International Astronomical Union, the Canadian National Committee of the IAU, the National Research Council of Canada, and of Dr. J.L. Locke, Director of the Herzberg Institute of Astrophysics, who placed the considerable resources of the Institute at our disposal.

I must mention the memorable contributions of Drs. Bok and Morimoto to the after-banquet speeches. Their oratory, alas, is recorded only in the minds of their audience. Dr. Morimoto presented me with a bottle of saki large enough to take a bath in, and was later kind enough to give repeated demonstrations of its appropriate disposal. Dr. Bok by his colourful reminiscences added much to the younger generation's appreciation of the early days of radio astronomy. I retain the handwritten notes of his talk, and had some thought of publishing them, but I decided eventually not to risk a libel action. I originally asked him to give the after-dinner speech at "our meeting" while he was attending a conference at the Herzberg Institute. He readily agreed. Unfortunately Bart, dedicated to the task at hand, had but one meeting in mind, the one he was attending, while I, immersed in the organisation of Sympoisum 87, had thought only of that. He retired immediately to his hotel and prepared his talk, then sat through the conference dinner that night without being invited to the microphone. All's well that end's well. The speech, like good wine and Bart himself, must have improved with age, for when it was eventually given, it was more than a success.

Finally, I know that all who attended the Symposium will join in expressing their appreciation to Mrs. Ghislaine DesChênes and Mrs. Mary Saver for their unflinching cheerfulness and efficiency at the information desk. Their ability to cope with every crisis smoothed many a potentially rough moment. They both contributed enormously to the pre-conference preparations. Mary, in addition, shouldered the burden of the typing load created by the editor's megalomania.

Bryan Andrew