MAKING THE ALPHABET DANCE – PART TWO – A. Ross Eckler

Since I wasn’t sure what would appeal to this audience, I assembled a potpourri of talks and audience participation for Friday evening. I led off with the observation that wordplay (1) is an intellectual pursuit in which anyone armed with patience, a dictionary, and alertness to possibilities can take part, and (2) is created out of materials at hand such as restaurant menus, beauty-parlor names, and the letters of President Reagan’s name. I started by challenging the audience to discover what was unusual about the word Mohonk (if the letters of the alphabet were written in a ring, its letters cluster in a narrow sector, K through O), and gave my set piece of beauty parlor nomenclature; then Faith came on stage to challenge the audience to construct a poem out of an alphabetized list of words (an overnight task which no one, apparently, tried). For the first piece of resistance: I donned a rather hot and stuffy Reagan mask, and was interviewed by Faith but constrained to answer in words using only the letters ADEGILNORSW (the letters in Ronald Wilson Reagan). I invited eighteen people onto the stage to hold the letters of his full name, and gave them instructions for rearranging themselves into various anagrams such as INSANE WARLORD and NO, DARLINGS, NO ERA LAW. The audience seemed to enjoy it, and Gloria thanked us profusely, but few if any subscriptions to Word Ways resulted and we weren’t asked back to the seminar in later years.

What about word-related columns in other magazines? I often thought that Martin Gardner had an ideal job as Mathematical Games columnist for a large-circulation magazine such as Scientific American. When he challenged readers to improve on the solution of a problem in recreational mathematics, he could count on hundreds of responses. How nice it would be if I could tap into a linguistically oriented audience of similar size! In May 1972 the British magazine Games & Puzzles was launched, and a month later Darryl Francis began to write a regular one-page column on logology for it. In February 1976 the puzzle editor of the magazine, David Wells, wrote me to say that Darryl had decided to give up his Word Row column because of work pressures, and asked if I would be willing to take his place. I pondered the offer awhile. Games & Puzzles did not have a particularly large circulation (about ten thousand, mostly in England), and I sensed that I would be at a disadvantage writing for an English audience. Furthermore, the pay was extremely nominal, only five pounds sterling per thousand-word column. However, I decided it would be very little additional work for me to adapt articles that had appeared in Word Ways, or ones which I had written for future issues, and it might be a stepping-stone to an American magazine. By moving quickly, I debuted in the May issue with a column on Russian-language Scrabble as depicted in Nabokov’s novel Ada and followed this in June and July with Q-words in which the next letter is not U, and a poem composed of the words of another poem (vocabulary mouth poetry). In all, I contributed nineteen articles to a total of 22 issues through May-June 1978. By then it was clear that Games & Puzzles was in some financial difficulty, for they had earlier issued two other double-month issues. In July 1978 new owners took over and transformed it to a quarterly magazine in 1979. Apparently they regarded Word Row as expendable, for instead of a general column on recreational linguistics the editors included the occasional word puzzle in a mathematical puzzle column.

I had asked the former owners of Games & Puzzles to hold my five-pound payments until I could collect them on my next visit to England. This was originally scheduled for the summer of 1977 but the ill health and subsequent death of Faith’s mother delayed it until September 1978. Upon our arrival in London I telephoned the offices of Games & Puzzles and announced I would visit them to collect my money. When I got there I found a classic case of what Lois called “creative inefficiency”—no one seemed to know how much I should be paid, and I had to reconstruct from memory the number of columns of mine they had published (only the last few issues were available at the editorial offices). Eventually we settled on 150 pounds sterling as a fair payment. They wrote me a check which I promptly cashed at a nearby bank. As they had
only two unused columns of mine on hand, I gave them five more, but none of these was ever published. Though I didn’t know it at the time, this was my last contact with Games & Puzzles.

In October 1976 Martin Gardner called up Haywood Cirker, the president of Dover Publications, urging him to publish a book of Word Ways material. Cirker in turn called me and arranged for a luncheon meeting with him and two Dover editors in New York on December 6. At the luncheon he explained I would receive a fee of $1500 instead of royalties, and agreed to give me a free hand in the selection of material. He also asked whether I could prepare a book devoted solely to word games, but I pointed out that I didn’t have enough material. I didn’t care much for the monetary arrangement, but on the other hand I liked Dover’s reputation for keeping a book in print almost indefinitely instead of selling to a remainder house in order to gain warehouse space.

He promised to send a contract at once, which would call for delivery of copy in nine months. Why should I take that long if all that was needed was a cut-and-paste job on existing Word Ways articles? In the next ten days I planned sixteen chapters, and typed up connective material for one-and-one-half of these. By mid-January I had completed 19 chapters totaling 219 pages, far more than the 128 pages Dover had proposed. My thought was that this would give Dover a chance to pick and choose, or (I hoped) they might be so impressed with the material that they would revise their 128-page limit upward. In view of their interest in word games, I prepared one chapter summarizing paper-and-pencil word games that had appeared in Word Ways and in one of the Games & Puzzles columns.

I had little trouble getting permission from Word Ways authors to use their material, with the exception of Dmitri Borgmann. He first requested a proportionate share of the royalties, but when I pointed out this would be only $150 if (say) ten per cent of the book was based on his work, he relented and said that it was all right to use his material without charge, up to a ten per cent maximum.

On January 21 I made a quick trip to New York to drop the completed manuscript at their Varick Street offices, only six weeks after the initial planning meeting. Perhaps, I thought, this would hasten the appearance of the book. How wrong I was! Months passed, and I heard nothing. In January 1978 I wrote Dover, inquiring about progress; they answered that “personnel changes and other problems” had delayed them, but they had hopes of getting to work on it in the next month. Again, silence. Exasperated, I wrote in November 1978, asking for the return of the manuscript if they did not plan on publishing the book. They again blamed a shortage of editorial staff, but pointed out that this had recently been corrected and I could expect to see Word Recreations in the fall of 1979.

At this juncture, Dover took a hard look at costs and proposed that the book not be set in type but instead photo-offset from Word Ways camera-ready copy. On March 15 I met at their office to discuss the new approach, in particular the necessary amendments to the original Word Ways articles. Robert Sietsema, the new editor assigned to my book, gave me paste-ups of the actual pages they planned to use, about 60 per cent of the material I had supplied them more than two years earlier, with the request that I supply them with the original camera-ready copy and that I type up a couple of pages of corrections. The length of the book was set at 135 pages. Noting that A. ROSS ECKLER anagrammed to SALES CORKER, he hoped that sales would be good.

A slight hitch arose in April when Cornell linguistics professor Charles Elliott had his article “Superl” accepted for publication in a Doubleday anthology series. The Doubleday publishers
threatened not to use his piece when they learned of its putative appearance in *Word Recreations*, and it looked as if Elliott would have to choose which place he wanted it to appear in. In view of the fact that “Superl” had already appeared in *Word Ways*, Doubleday’s fastidiousness was hard to understand. I think the problem was eventually resolved; at any rate, *Word Recreations* retained his work. Sietsema wrote “A substitution would weaken that chapter tremendously, to the detriment of the entire book.”

I received my 50 free copies of the finished book, plus my $1500 payment, in February 1980. Reviews were printed in the July 1980 Enigma (the magazine of the National Puzzlers’ League) and the January 1981 Four-Star Puzzler, but not in any magazine or newspaper of wide circulation. I thought the book quite attractive in appearance, and its price of only $2.95 seemed low enough to stimulate sales. In January 1981 Dover reported sales had been doing nicely, with 2712 copies sold the first year. However, in view of the fact that sales had declined during the last half of the year, they were unwilling to consider a sequel. By February 1982 the story was much the same. Sales were fair, enough to keep it in print awhile, and about what Dover expected for books in the intellectual recreations category.

In June 1981 I received a new opportunity to create an anthology of *Word Ways* material. Leonard Ashley, who a few years earlier had introduced me to the Names Institute at Fairleigh Dickinson, wrote that he had been made general editor of a Library of Onomastics, and was planning to publish during the first year ten to twelve reprints of onomastic classics and an equal number of new works. Could I select 320 pages of onomastic articles from *Word Ways*, supplying Irvington Press of New York with the camera-ready copy? At first I didn’t believe that *Word Ways* could produce that much onomastic-related material, but a quick survey proved that it was possible if just about everything were used. I accepted his invitation, but I didn’t get the go-ahead until the end of October. I spent November and December assembling the camera-ready versions of 105 *Word Ways* articles, plus typing Colloquy inserts to be placed at the ends. In March I signed the contract with Irvington which promised delivery of the camera-ready manuscript by June 1982 and provided royalties of 10 per cent of the net revenues on the first 2000 copies, 12 per cent of the next 2000, and 15 per cent thereafter.

As before, most *Word Ways* authors were happy to give me permission to use their material. The one exception, again, was Dmitri Borgmann, who grumped “I have nothing whatever to gain from the inclusion of eighteen of my articles in the new onomastics series; I do not feel especially charitable, and I have always disliked Professor Ashley’s essentially nonlogological contributions to *Word Ways*.” He asked for either a payment of $10 per article, or else a copy of the anagram dictionary generated by Tom Kurtz. Checking with Tom, I discovered that the computer tape was in the possession of Stephen Waite, who by then had left Dartmouth College; Tom was unable to get in touch with him. So I ended up paying Dmitri the $180 instead.

I delivered the completed manuscript to Irvington’s New York offices on June 21. A month earlier, I sent Ashley a photocopy of it, to which he responded “I couldn’t put it down; I read right through the MS of *Names and Games* and was delighted at its vigor and variety. I think you have a winner here, with something for everyone. Some few parts find me a little ill-prepared, too technical, but others will enjoy these as well.” Irvington Press set the hardcover price at $39.50 which I though rather expensive, and listed it in *Books in Print*.

I hoped that the book might appear by the end of 1982, but months and months went by with no communication from either Irvington or Leonard Ashley. At the 1984 Names Institute meeting he reported that Irvington Press was stalled on the publication of some seven or eight books in the
onomastics series, being long on promises but short on performance. He talked of terminating their contract and moving the series to a college press instead. However, it was more than a year before the Irvington manuscript was returned to me.

The new publisher, University Press of American in Lanham, Maryland, wrote me May 13 1985 to say that they had accepted my book for publication. They talked in terms of a book costing between $7.75 and $19.50 in paperback, depending on the number of pages, and $10 additional in hardcover, with an initial press run of 500 to 750 copies. As long as at least 50 copies per year were sold, they would continue to reprint the book and keep copies in inventory. I was expected to provide them with camera-ready copy adhering to various typographical standards, including right justification of margins. Royalties were similar to Irvington: 5 per cent for the first 500 copies, with increments of 2.5 per cent for additional 500s up to a limit of 15 per cent for all copies beyond 2000.

I found all of this reasonable, and in fact welcomed the chance to revise the earlier book by weeding out weak articles and replacing them with material that had appeared in Word Ways since 1981. At once I started on this task, and completed 232 pages by mid-July of 1985. Interrupted by summer vacation and the illnesses of my parents, I didn’t get back to the project until early December, when I finished up the 280 pages of main text plus 15 or 20 of introductory material.

However, University Press included one exceedingly onerous condition in its contract: before printing of the book could begin: I had to obtain a non-returnable order of 85 copies from one or more bookstores, who would be allowed a 22 per cent discount on the list price. Apparently, University Press was thinking in terms of a college bookstore which would be forced to stock a book used in a professor’s course. Since I did not fit this pattern, I asked for a waiver of the requirement, but without success. I wrote Leonard Ashley, who said that other authors had similarly complained; he would see what he could do about it (nothing, it eventually turned out). I wrote Laurence Ur dang, editor of Verbatim, who in conjunction with his magazine ran a mail-order bookstore featuring dictionaries and other word-related books. It seemed clear that this was the single most promising outlet for Names and Games, but Ur dang was willing to order only ten copies on a non-return basis, and those only if a 50 per cent discount were offered. I finally decided that my best strategy was to have Word Ways order the 85 copies and offer them to its readers; in time I would be able to sell them and recoup my investment.

I delivered the camera-ready copy to University Press on January 30 1986 and signed the contract at the same time. They reluctantly agreed to the Word Ways purchase (they had a standing rule that the author could not purchase the 85 copies himself), and priced out the book: 225 copies in paperback at $13.75, and 150 copies in hardcover at $25.75. In April I forward the $911 to them and soon received my 85 copies. These I successfully sold at $12.95 apiece over the next several years by advertising in Word Ways, no doubt taking away many sales that otherwise would have directly enriched University Press. During the next 15 years I never found a used copy in an old bookstore, and only two, in hardcover, on the bibliofind.com website on the Internet (I was able to purchase one of these for about $15).

These two books were essentially anthologies of Word Ways articles. My ultimate dream, however, was to produce an encyclopedia of logology. It was easy to put off working on this on the grounds that the subject of logology had not yet been fully explored. In October 1984 George Levenbach, a retired Bell Labs statistician who subscribed to Word Ways, dropped by my Murray Hill office to show me a book a Dutch friend had sent him: Opperlandse Taal-
logology had stimulated the minds or at least brightened the hours of a few hundred people, and would continue in some recognizable form for many years to come.

It was hard for me to contemplate giving up Word Ways, even though I knew that ill health would eventually make this inevitable. Should I turn it over to a successor while there was still time, or rely upon my heirs to make a hasty transfer after I was incapacitated or dead? Two people, Philip Cohen and Eric Albert, volunteered many years ago, but the former became occupied with the monthly newsletter “Graffiti on the Sphinx” for the NPL, and the latter developed carpal tunnel syndrome which made it impossible for him to work long hours at a computer keyboard. For years I played the game of “Whom would I pick?” but almost always my candidates fell short; I could not identify anyone at least twenty years younger who had the breadth of interest combined with a measure of economic security.

By the turn of the century I realized that the future of Word Ways might well be on the Internet. After I gained Internet access via American Online in late 1997, Susan created a web page for me there, but few if any people ever found it. So, assisted by Chris Cole’s lawyer, I purchased the domain name wordways.com in 1999, although registration mixups delayed its availability until 2000. However, I hadn’t then defined what I would use the website for. Would making Word Ways freely available on line gain enough new aficionados to offset a possible loss in subscriptions? Perhaps the on-line version should be restricted to those authors who welcomed this exposure. In any event one more job requirement had been added for my successor: computer and Internet literacy.

In February 2000 I had an epiphany, realizing that Mike Keith was the most logical successor to come down the pike in a long while. I wrote him by email on March 8, 2000, asking whether I could put him on the short list of future editors, and to my surprise and delight he wrote back “I would be pleased and honored...I’ve been interested in logology since (at least) I was 12 years old and read Playing With Words by Shipley...If you would be interested in starting to ‘ramp up’ the wordways.com Web site now, I could start working in that area at any time. I’m very familiar with HTML and the mechanics of creating Web pages (and also the issues involved in packaging the articles so that the simultaneous creation of the print and electronic versions can be as automated as possible), so I think I could contribute a lot there...Publishing on the Web opens up interesting possibilities for the use of graphics and color.” During the late summer of 2000 I at last decided how to use the website. I identified approximately 100 landmark articles from old Word Ways which to me showed what logology could be, and spent considerable time typing those dated before August 1995 into the computer. These I sent via diskette to Mike, who quickly incorporated them, along with an author index of Word Ways articles from 1968 through 1997, onto the website. I also made a first pass at revising a Word Ways topical index which I had first created in the early days of the magazine, and which Chris Cole had urged me to add to the website. Now how could attention be called to this corpus to the potential wordplay enthusiast?

In July 2005 I seriously began the process of finding a successor editor. For the past year I had been bothered by arthritis in my right shoulder, incapacitating me perhaps once a month, and forcing me to contemplate my mortality. Were I suddenly to become unable to continue editing, what would become of the magazine? It might be forced to suspend publication for a year or more, just as Verbatim did when Laurence Urndag quit. Or it might never resume! An orderly transition was far more preferable—even though I hated the idea of giving up the editorship. (Ross, essay assessor palindromically recognized this role.)
But finding a new editor wasn’t easy. I first approached Mike Keith, who begged off on the grounds that he now needed time to mentor the interests of his teenage daughter, and was also busy with many work and personal projects. “I don’t think it would be right to take the helm of the magazine if, as I unfortunately think is the case, I couldn’t devote 100% of my heart and soul to it. O.K., well maybe not 100% — that’s never feasible, I guess — but a large fraction, at least. And I’m just not sure that’s possible for me right now.”

I approached Eric Albert (who had expressed willingness in 1999), Chris Cole, and Dan Tilque without success. Chris offered to subsidize Word Ways costs, and proposed Philip Cohen, who had edited a monthly analysis of NPL puzzles, Graffiti on the Sphinx, since 1983. Unsurprisingly, Philip replied that GotS was his prime interest, and confessed that he was unreliable with respect to on-time publication.

In June 2006 Anil (Charles Melton), one of Word Ways’ most enthusiastic contributors, came up with an extraordinary offer. Aware that Dave Morice was unable financially to act as editor, he proposed to pay up to $5000 per year the “excess cost over subscription monies”, and to rewrite his will and bequeath to the editor of Word Ways $50,000 (or $200,000 if his Dallas sister predeceased him). On the strength of this, I offered Dave the editorship, but he, too, declined, on financial and health grounds: “I am not good at all in administrative duties...Currently it’s difficult for me to dig up writing and drawing jobs pay the rent and my government loan that has been dogging me ever since 1972... If I were to take over Word Ways, I would be afraid that that would lead to the end of the mag, and I wouldn’t want to have that stress to bear”. Actually. I was somewhat relieved, for Dave had been consistently late in getting Kickshaws to me over the years.

So what now? On August 25 I offered the editorship to Jeremiah Farrell, a contributor of high-quality mathematical articles since 1992 (sometimes with his wife Karen). His work as co-organizer of the periodic Gatherings for Gardner proved that he could also handle deadline-sensitive administrative tasks, but I feared that he would refuse on the grounds that this required too much time. But to my great surprise (and considerable relief), he accepted. Jerry was the creator of the Nov 5 1996 NY Times crossword puzzle which had a clue (39 & 43 “Lead story in tomorrow’s newspaper”) that could be answered either with BOBDOLE ELECTED or CLINTON ELECTED! To this day Will Shortz considers this the greatest crossword puzzle he has ever seen.

Over the next few months, the wisdom of this choice became apparent, culminating in the on-time appearance of the first issue under his aegis in early February 2007. It was a Festschrift in honor of me and Faith, containing a dazzling variety of articles and puzzles based on our names and Word Ways. (The surprise would have been greater had Dave Morice not inadvertently sent me an e-mail meant for Jerry.) It seemed likely that Word Ways might endure awhile longer.

Faith maintained that I would badly miss being editor after 37 years, and to some extent this was true. However, Jerry asked me to stay on as part of an editorial board, and also asked me to contribute a regular column revisiting earlier articles (which I christened "Look Back!"). I deluged him with a cascade of short articles, even doing some new research. All this served to mitigate the pain of withdrawal.

On December 12 2010, I saw myself portrayed by an actor in front of an audience of 35 on a Jersey City stage (The Actors Shakespeare Company at New Jersey City University), the premiere performance of a week-long run there. The 90-minute one-act play, “Logomaniacs” by
Paul Fleischman, consisted of short sketches of 26 wordplay notables, one for each letter of the alphabet, from Walter Abish who wrote *Alphabetical Africa* (“Ages ago, Alex, Allen and Alva arrived at Antibes...”) to Ludwig Zamenhof, the creator of Esperanto. The play also featured Alastair Reid who collected word play like sea-shells ("ounce, dice, trice, quartz, quince, sago, serpent, oxygen, nitrogen, denim"), Howard Chace who invented Anguish Languish ("Ladle Rat Rotten Hut"), Ignatius Donnelly who insisted that Francis Bacon was the author of Shakespeare’s plays, Georges Perec who wrote both the E-less novel *La Disparation* and its E-full counterpart *Les Revenentes*, Colonel Robert McCormick who promoted spelling reform in the Chicago Tribune, and Arthur Wynne who constructed the first crossword in 1913. To smooth the narrative, Fleischman introduced related word people in adjacent letters, such as Perec followed by fellow Oulipian Queneau who created *One Hundred Thousand Billion Poems*, and Wynne followed by cryptic crossword constructor Ximenes. He followed me with Word Ways contributors Darryl Francis and Jeff Grant, but neither were represented by on-stage actors, the only two not so honored.

To economize, Fleischman employed only four actors, who rapidly changed costumes between vignettes. He had a challenging task, that of making the arcane subject of wordplay palatable to a general audience, which he solved by mounting a fast-moving production with melodramatic touches such as a circus Barker cracking a whip. Names and examples illustrating particular types of wordplay were projected on a screen at the rear of the stage, and the whole was accompanied by appropriate music, from Sousa to easy listening. It must have been particularly difficult for Fleischman to choose audience-friendly examples of hardcore logology from *Making the Alphabet Dance*. He settled on Letter Shifts (*add* to bee, *ice* to leg, *fusion* to layout), augmented by *Isograms* (Melvin Schwarzkopf), Scrambled Alphabets designed to maximize (or minimize) the number of four-letter Pocket Dictionary words in alphabetical order (*abet, bevy, chin*...), and Special Transpositions consisting of first names converted into last names (Gary Gray, Eric Rice, Ronald Arnold). In a preliminary version of the play, he included Self-Enumerating Sentences, from the pedestrian “This sentence has five words” to Lee Sallows’s remarkable computer-generated sentence specifying the number of a’s, b’s, c’s etc. in it.

Andy Warhol once said that everyone in the future will enjoy fifteen minutes of fame. I got less than ten...but few people ever witness themselves portrayed on stage by a professional actor!
ADDENDUM

In March 1979 I had lunch at Bell Labs at Murray Hill with David Kahn, author of *The Codebreakers*. He related a story about the famous cryptologist William Friedman who had, it seemed, once met a man with a large collection of *Gadsby* stored in a Los Angeles warehouse. The source of the story was Friedman’s son John, who then worked for Bell Labs at Murray Hill. When I talked with him about it, I learned that the man in question was a vice-president of Pacific Telephone who subsequently was transferred to Pacific Northwest Bell. But he couldn’t remember the man’s name! Going over the names of Pacific Telephone vice-presidents of the late 1950s and early 1960s with him, he thought the name William Straley sounded familiar. I obtained Straley’s retirement address in California from the Bell System Pioneers office and wrote him about the book. Straley conceded he had talked with John Friedman about cryptology and *Gadsby*, but he knew nothing of any cache. Finally I wrote the George C. Marshall Research Foundation library in Lexington, Virginia, the repository of Friedman’s papers. They owned three copies of *Gadsby* which had been obtained through Pacific Telephone. Was this the legendary cache?

In June 1978 Will Shortz mentioned to me that he had purchased a copy of *Gadsby* for $25 at a New York Antiquarian Book Fair. Hoping to duplicate his feat, I attended one at the Sheraton Hotel in the spring of 1979 without success. I asked Will if he would be willing to part with his copy. He agreed to trade it for Levine’s three-volume pattern word list. I wasn’t about to part with my own set, even for *Gadsby*, but I recalled that Bill Rawlings, a Word Ways subscriber, had written me a few months earlier asking for help in disposing of his Levine set. I got in touch with Rawlings at once and arranged to purchase his set for $54. I finally got my copy of *Gadsby* at the National Puzzlers’ League convention in Stamford Connecticut in July 1979.

Another rare item in my collection are back issues of the Enigma, the National Puzzlers’ League magazine. In the June 1966 issue, Oedipus (pseudonym for Charles Jacobsen) offered to sell his complete collection of some 750 back issues of the magazine, and donate 25 per cent of the money earned in this sale to the League. Apparently he was successful in locating a buyer, for a few months later the Treasurer received $35 from him. But not a word about the identity of the buyer was given. Oedipus died four years later, shortly before anyone interested in NPL history thought to query him about it, and his family was of no help. Nor did any of the present-day old-timers of the League know where the collection had gone. I wondered if the issues had been purchased by someone active in the League around 1966 who dropped out a few years later. Looking over old membership lists, I soon identified two candidates, Uncle Rebus (Leonard Greenberg) and Wortgaukler (Craig Melcher). I found Uncle Rebus in November 1982 by the expedient of writing another NPL member of that era whom he had recruited. Wortgaukler took longer, but was tracked down in September 1984 with the aid of Blackstone who remembered that he had some connection with a former NPL member whose son lived in Vermont. Unfortunately, neither man knew anything about the missing Enigmas. In November 1984 I wrote Damar (David McCord), another League member of that era who was a book collector, but he likewise could not help. To this day the issues are still missing. I eventually acquired a complete set back to 1926 by making the high bid of $1500 on Larry’s bound collection in 1989.

Like genealogy, hiking and caving, I was defined by the field of logology. Yet it was more than just another enthusiasm. Certainly since Dmitri Borgmann’s death, I was the world’s foremost practitioner of this subject, and I believed that logology in general and Word Ways in particular would be the reason for which I would be longest remembered by the world at large. Even though it would never have the social or intellectual impact of a vaccine for AIDS, the reduction of the carbon dioxide buildup in the earth’s atmosphere, or contact with extraterrestrial beings,
Beginning in the 1970s I assembled a considerable collection of books related to logology and wordplay. The scope of the collection, at first limited to unabridged dictionaries and specialized wordplay dictionaries (anagram, reverse, pattern) spread to general books on wordplay, books written under literary constraint, and old puzzle material. I also subscribed to (or exchanged Word Ways for) journals such as Logophile, Verbatim, Maledicta, Cryptologia, Semagames (a Catalan journal of palindromy), Wordsworth, and The Palindromist. I found many out-of-print books in used bookstores, and my collection was substantially augmented by review copies sent me by various publishers.

The most unusual—certainly the rarest—book in my collection was undoubtedly Gadsby, a fifty-thousand-word novel without the letter E. It was written by Ernest Vincent Wright in the late 1930s when he was a patient in a Los Angeles Veterans Hospital, and published by the Wetzel Company in Los Angeles in 1939. When I began to look for it in used bookstores along Fourth Avenue in New York City in 1975, few dealers had heard of it and none had it in stock. In the August 8 1975 New York Times I read of a book-search service in Atlantic City rated the most successful in the country, a “super-sleuth” with a stock of 150,000 volumes and a 75 per cent success rate. I wrote them in February 1977 asking them to search for the book but they were unsuccessful.

I wondered what had happened to the unsold inventory. Boris Randolph, a Word Ways subscriber living in Los Angeles, located a sister-in-law of the publisher. I wrote her and soon heard from the publisher’s daughter, Mrs. Ralph McIntosh. She said that the Wetzel Company had gone out of business long ago, and there were no unsold stock of Gadsby in the family’s possession.

Randolph also sent me a death certificate for Ernest Wright which opened up a new line of inquiry. Since Wetzel had been a vanity press, it seemed likely that the inventory would have been turned over to Wright’s estate after his death in 1939. Perhaps there was a stock of books squirreled away in someone’s dusty attic. Unfortunately, the death certificate indicated that Wright was single; to find present-day descendants I would have to look for brothers or sisters. The death certificate indicated that he was born in 1871 in Boston, the son of Henry and Clara (Clarke) Wright. A check of Wright and Clarke genealogies failed to turn up any leads. I thought surely that I could locate brothers or sisters by examining the Soundex files for the 1880 Federal Census, which indexed by surname all families having one or more children under ten years of age. Alas, when I checked the Massachusetts Wrights I could not find any Henry and Clara with a son Ernest! The death certificate stated that Ernest’s father was born in Belchertown, Massachusetts. A few hours examining church and cemetery records in that community in August 1978 revealed Henry Wright born in 1814 who married Christina Hawes in 1838; could he have been the grandfather?

In 1979 I learned from Boris Randolph that the Veterans Administration file on Ernest Wright was located in Denver. This revealed a bit more information: in 1939 his sister, Mrs. M. W. O’Leary, then living at 285 Tremont Street, Newton, Massachusetts, was the person to whom royalty payments for the book were to be sent after Ernest’s death. Eric Albert, a Word Ways subscriber and National Puzzlers’ League member in the Boston area, visited this house in March 1982. The present resident had never heard of Mrs. O’Leary, nor had a next-door neighbor who had lived there for almost 40 years. I asked a couple of Newton weekly newspapers to run a query; I don’t know if they ever complied, but in any event no one came forth with information.
His amazing feats in computerized word squares were ended by his untimely death from lung cancer in March of 2007.

I had neither the time nor the inclination to master the intricacies of logological programming for the computer. Perhaps if I had, I might have developed a profitable sideline to Word Ways. Jay Comras, the founder of a thriving software company operated out of his East Hanover home who had developed numerous manuals and personal computer disk programs preparing students for the SAT and ACT college examinations, wanted to extend his offerings to include a disk devoted to wordplay. Having discovered Word Ways a few years earlier in the library of the Fairfield school system where he worked, he thought that it contained much ingenious material that could be adapted for his purposes. Faith and I had a get-acquainted session with him the evening of October 19, 1984. Two further meetings on January 20 and February 10 clarified my understanding of the type of wordplay he wanted, and I agreed to produce a scenario with five examples, written with sufficient detail that a competent programmer could put it into machine language. We agreed verbally to go partners on a 50-50 basis, involving perhaps a few thousand dollars of expense for advertising. He dangled the financial plum of $50,000 to $100,000 in earnings if the disk had a good sale. I constructed five examples:

1) Matchword: a logological version of tic-tac-toe
2) Scrambleword: the National Puzzlers’ League anaquote, in which one reassembles a message from an alphabetized set of three-letter segments (as in ELL ISH WAR = war is hell)
3) Crashword: a game in which the object is to be the last person to add a word to the list which doesn’t crash with any of the earlier words (the game of Uncrash, featured in Word Ways Logomachy in 1973)
4) Guessword: guess a three-letter target word selected by the computer with as few probe words as possible, the computer telling you after each probe word whether it is alphabetically earlier or later than the target word
5) Twistword: find a set of six words containing three different letters in all possible orders, using as few extra letters as possible (for example, hEIR, mERIt, pIER, IRE, REIt, dRIEs uses only seven extra letters)

I turned this proposal over to him on May 2. As always, Jay was extremely enthusiastic about what I had done, and promised to get a programmer to work on it—but I never heard from him again! Perhaps he found it impossible to find a programmer, or was too busy with other projects to arrange for one; I never called him to find the reason. Had I been able to do the programming myself this collaboration might have flourished; no doubt I paid the price for a lack of technical aggressiveness.
via Dave Dennison. By the end of the year Tom sent me a sample printout of a few pages of anagram dictionary. We agreed it would be better to sort the words by length first, since one could then deal with smaller lists, 35,000 words or less. However, the task proved more difficult than Tom had expected, and the project languished until 1976, when his colleague Stephen Waite actually produced the dictionary (seven side inches of computer printout). Tom tantalized me with reports of long transposable words and short multi-transposable words, but didn’t offer to make me a copy (at $63) or send me his. When Faith and I visited him in 1978 I asked if he would lend me his copy for Word Ways research. Since it had been gathering dust in the corner the past two years, he readily assented, and at last I had my anagram dictionary. When Word Ways subscribers heard of its existence, they wanted copies, and I arranged for seven to be printed for $136 apiece in 1982.

During the long gestation period for the anagram dictionary, the Mathematics Research Center independently created an anagram dictionary listing only anagrammable combinations. I obtained a copy from Dennis Ritchie in 1975, and eventually pried loose two more copies for Darryl Francis and Dmitri Borgmann, then planning to issue such a dictionary themselves (this never came to fruition). Ritchie incorporated a program that automatically pluralized nouns, added past tenses to verbs, and so on, uncovering many anagrams that Tom’s straight dictionary listing had overlooked. Both anagram dictionaries helped me greatly in research.

During my editorship of Word Ways, the computer in logology evolved from a compiler of specialized word lists to an essential tool for logological research. Fortunately, computer-literate logologists also appeared, beginning with occasional Word Ways contributors like Doug McIlroy, Eric Albert, Anthony Sebastian, Frank Rubin and Stephen Root. The earliest use of a computer for other than list-compilation was probably Doug McIlroy’s 1975 discovery of all possible seven-squares that could be generated from the Merriam-Webster Collegiate dictionary, and a similar unveiling of double six-squares from the Collegiate the following year. About the same time Dennis Ritchie mined from Webster’s Second Edition 3330 sets of pangrams, published in Word Ways in November 1983. However, my first attempt to “seed” a logological problem with a computer expert was less than successful. In 1978 I constructed the word set HATED HORNY FITLY FAUNS WIRES WOULD in which each pair of words had exactly one letter matching in both alphabet and position. I proposed to Bernie Cosell of the National Puzzlers’ League in the summer of 1984 that he use the computer to find eight seven-letter words having the same property (I had come within three letters of solving this by hand). In January 1985 he reported “Crash Groups report: no joy. Although it was certainly not for lack of trying—I think I’ve now consumed roughly two hundred hours of VAX CPU time on this one.” He detailed how he had called in a “truly great computer-hacker,” Mike Beefer, to help him reduce the search time for the six-word problem from two years of computer time to only 60 hours, but the eight-word problem still needed an unacceptable 12,000 hours. Advances in computer power eventually made it possible in 1998 to do this on a personal computer!

In 1989 Leonard Gordon arrived on the scene, the first Word Ways contributor who could at the drop of a hat write computer programs to solve specific problems that I proposed. He was shortly joined by Lee Sallows and Christopher McManus, and after Leonard dropped out of sight in 1996, he was replaced in 1998 by the equally-prolific and versatile Mike Keith. More than once, I would email Mike with a problem and receive a computer-based answer in a day or two. However, after the turn of the century Rex Gooch became the premier Word Ways expert using the computer to solve intractable word problems. He put prodigious effort into the construction of a ten-square, and was eventually rewarded with the following nonpareil:
later I experienced a measure of schadenfreude when his next two books, *Le Ton Beau de Marot* and *Eugene Onegin*, suffered equally negative *Times* reviews.

Perhaps because of Hofstadter’s review, sales were modest. In only one six-month royalty period did I earn any money (3602.95) beyond my advance. By April 30 1999, when the hardcover edition had been remaindered, 2294 hardcover copies and 1780 paperbacks had been sold. (I was told that the original printing was 9500.) By 1999, typically 30 copies of my book were being offered on the Internet secondhand book market, at prices from $5 to $25. I purchased 200 copies for $635 from St. Martin’s Press for future sales through Word Ways. In the summer of 2000 the paperback edition was remaindered, but I declined to acquire any from St. Martin’s.

In 1998 I asked Bob Weill if he would be interested in a follow-on book, *A Word Ways Sampler*, consisting of less-technical articles. I sent him ten sample chapters but he said no, because the paperback sales of *Making the Alphabet Dance* had been disappointing. In May 2008 Chris Cole suggested I submit the chapters to Peter Gordon, the executive editor of Sterling Publishing. When Gordon agreed to look at it, I spent the next couple of months quickly creating 21 additional chapters, for a book 200 pages long. But on Aug 14 he turned me down as well.

Faith has always deplored the use of computers in logology, saying that they spoil the fun of searching for logological oddities by hand. It is true that computers trivialize formerly laborious tasks like finding long dictionary examples of pair heterograms (words containing exactly two occurrences of each letter, such as HORSESHOE or HAPPENCHANCE). I contend, however, that computers merely change the class of interesting problems to be worked on, allowing one to look at previously impossible problems.

In the early days of Word Ways, computers were principally used as tools to compile specialized word-lists. The most famous of these were the reverse dictionary based on the Merriam-Webster Second Edition which was compiled in the early 1960s by A.F. Brown of the Linguistics Department of the University of Pennsylvania under an Air Force contract, and the pattern dictionary based on the Merriam-Webster Second and Third Editions compiled by Jack Levine of the Mathematics Department of North Carolina State University in the early 1970s. (In a pattern dictionary, words with the same letter patterns, such as EXCESS and BAMBOO, are grouped together.) The Brown dictionary was available for $40 in eight volumes from the government, but amazingly the three Levine books were free! They soon went out of print, and later were highly prized collector’s items; Dmitri Borgmann sold his three volumes in 1976 for $96. I found both references extremely valuable in researching Word Ways articles.

I personally encouraged the creation of another specialized word list, the anagram dictionary. In the 1960s Martin Gardner suggested in a Mathematical Games column in *Scientific American* that an anagram dictionary (one in which the letters of each word are arranged in alphabetical order and these “words” then alphabetized) would be valuable for logologists to have. In such a dictionary anagrams are brought together (for example CEORST is the alphabetical order “word” for both CORSET and ESCORT). Two varieties of this dictionary are possible, a full dictionary listing every word, and a limited dictionary listing only those words for which one or more anagrams exist. Small dictionaries of both kinds were already available, but I argued that a full dictionary based on the Merriam-Webster Second Edition would be much more useful to logologists. In 1969 I learned that the Mathematics Research Center at Murray Hill had a copy of Webster’s Second on magnetic tape, and acquired a copy of this from Doug McIlroy. In July 1972 I discussed the idea of an anagram dictionary with Tom Kurtz, then Director of the Kiewit Computation Center at Dartmouth. He was intrigued, so I sent him the magnetic tape in August
of one minor discovery: By assignment of the values 1/6, 2/6, ... 13/6 to the letters EFHINORSTUVWX, one could make the six number-names ONE through SIX all convergent.

In 1994 I revised and enlarged my 1986 plan for an encyclopedia of wordplay, and typed the chapters into my computer. On January 10 1995 I wrote Martin Gardner for suggestions on a publisher; he recommended St. Martin’s Press, passing along my table of contents and introduction to Bob Weill, his editor there. To my surprise and delight, Weill called me on February 10, and only five days later agreed to publish the book. By February 20 he had sent me a contract providing for a $7500 advance royalty payment, half upon my signature and half upon the delivery of the manuscript. I was to receive 10 per cent royalties on the first 5000 hardcover copies sold, and 12.5 per cent on the next 5000. In April I sent him the manuscript, and St. Martin’s spent the rest of the year preparing it for publication at $23.95, which occurred in December, a bit too late to take advantage of Christmas. I was the guest of honor at two book signings, one at the Union Square branch of Barnes & Noble on February 4, and one at the Book Shop on South Street in Morristown on January 17. The audience at the former was sparse, consisting mostly of customers in the store that day who saw the posters advertising it. Perhaps ten or fifteen came to the Book Shop, where I signed half a dozen copies plus a small stockpile for future sales.

St. Martin’s had me solicit well-known authors for jacket blurbs, and I found their response most gratifying. Willard Espy wrote “Your mind will be right out there on the dance floor with those letters—whirling, leaping, two-stepping—having the time of its life.” Richard Lederer commented “Master logologist Ross Eckler shows that, in the whirled world of words, the play’s the thing. The author invites his readers to cavort in the playground of our language with words that clamber over jungle gyms, bounce up and down on seesaws, swing on rings, career down sliding boards, and merrily spin around on merry-go-rounds.” Martin Gardner added “No one living is a greater authority on English linguistic play than Ross. Making the Alphabet Dance will delight, amuse, and stagger the mind of anyone fond of the endless ways that letters and words can be manipulated” However, I cherished Lee Sallows’ comment the most: “I believe that Martin Gardner’s quote on the dust jacket is the simple truth, and those of us who love wordplay and letter play have to count themselves very lucky that it was you who took over Word Ways rather than anybody else. In who else could we have found such a perfect balance, as well as depth, of mathematical and literary interests, I wonder? One has only to run through the list of regular contributors (myself included) to see how narrow is the normal range of pursuit. No, we have you to thank for the thriving state of the field, and Making the Alphabet Dance will become the standard reference work for years to come.”

On the other hand, a two-page review by Douglas Hofstadter in the March 10 1996 New York Times Review of Books titled “Stunt Man” damned the book with faint praise. Hofstadter felt that 90 per cent of the material in the book could be characterized as “arbitrary sets of constraints devised with but a token regard for esthetics...maneuvering within the limits imposed by an arbitrary, ugly straitjacket and then resorting to vast data bases of unheard-of pseudowords to try to lend legitimacy to one’s awkward finds, seems to be just another ingenious way to waste huge amounts of time and mental energy.” (As an example of pseudowords he cited the 157 anagrams of AEGINRST.) To Hofstadter, what mattered more than “vacuous virtuosity ... [like] the spectacular yet empty pyrotechnics that permeate so many third-rate 19th century piano pieces” is a “sense of good taste and self-censorship.” St. Martin’s Press, apparently subscribing to the thesis that any sort of recognition by the New York Times was an undiluted benefit, was highly pleased by this review. I refrained from answering the diatribe, but was somewhat gratified to note that Soren Schoff anagrammed “Douglas Hofstadter” into “Gödel’s author’s daft” and many months
transposition square in which the letters in each row and column can be rearranged to form a word. In another variation, there are 120 ways one can select sets of letters, one from each row and column of a five-by-five array; with computer aid from Mike Keith in 1999, I showed that it was possible to anagram all of these into words. As already noted, my very first Word Ways article looked at the mathematics of partially overlapping word groups. As early as 1978 I was fascinated by the problem of finding eight seven-letter words, each pair of which crashed exactly once (had the same letter in the same position, as whOse and prOud). However, it was not until 1998 that Steve Root found 62 sets, including five restricted to the Merriam-Webster Collegiate Dictionary. (The best set was probably BIOLOGY DEATHLY SLOSHED BASTARD SELVAGE FISSILE DALLIES FLAVORS.) For mutually non-crashing words somewhat longer lists can be constructed, typically 15 to 17 words long for three-letter through six-letter words from the Merriam-Webster Pocket Dictionary. I labeled the faces of the five Platonic solids in such a way that words could be read off from the faces of a vertex, and similarly labeled the vertices so that words could read off from the vertices sharing a face. I also found ways to introduce words onto triangular and hexagonal tilings.

The seventh and final chapter in my original plan for the encyclopedia of wordplay was a bit different from the others, concentrating on letterplay tailored to the needs of the cardinal numbers ONE, TWO, THREE ... One exercise involved alphabetizing the number-names between 1 and 999, and then rearranging them in the sequence EIGHT, EIGHT HUNDRED, EIGHT HUNDRED EIGHT, ... TWO HUNDRED TWO. Did any of the alphabetized numbers appear in their original places? It was easy to show that none did, and to extend the argument to all number-names between one and one thousand vigintillion. I discovered that if one stopped the list at other points, matches did occur; for example Jeremy Morse found that the 231-list matched at 101, 200, 205, 224 and 227. Another exercise lined up the letters in an alphabetical horse race, each one advancing according to the number of times it had cumulatively appeared in the number-names. Although T bested E for a short time (in a race of length 39 up to a race of length 83), Dan Hoey showed by computer that E then kept the lead for a long time, not being bested (by N) until 1,908,414,049,538,005,261!

Many authors became interested in self-descriptive sentences of the form “This sentence contains five words” or “This sentence contains thirty-six letters”. It was much harder to balance sentences enumerating the numbers of each alphabetic letter in them, and this problem was not generally solved until Lee Sallows constructed a special-purpose computer to do the job. (Later, it became easy to do it with a general computer program.) More austere versions were also developed by Sallows, in which one merely listed the alternatives (five f, five i, five v, five e) or even embedded these in a crossword.

But the most elaborate number-name structures, and the ones I found most charming, involved numerical convergence. It has long been known that if one replaces a number-name with the number-name of its letter-count, all names converge to four (for example, eighteen to eight to five to four). Howard Bergerson found that if one replaces a number-name with the number-name of its letter score (summing the letters with A=1, B=2, ...), then all number-names converged to the number circle 216-228-288-255-240-. I wondered how many number-names could be made self-convergent by rearranging the alphabet (for example, starting the alphabet SIX or any permutation of it would ensure that SIX converges to itself). With computer aid from Leonard Gordon, I found that 38 could be so accommodated, using the rearrangement REFSW-VG--IXYD----T-NULOH of the alphabet. Lee Sallows generalized the problem to assign any number (not just a rearrangement of 1 through 26) to each letter, and by computer found that 74 of the number-names ZERO through NINETY-NINE could be made self-convergent. I was rather proud
SPONGE 654321. Noting that a word such as ABoDE has a high degree of alphabetic invariance (four of its five letters match the A-alphabet), I generalized the concept to local invariance (for example, coOPeRa)iVeY has 6 letters matching the M-alphabet). I devised a way to characterize the different shifts that occurred in a typical word. For example, WRETCH has four shifts: a W-alphabet for Wretch, a Q-alphabet for WReTch, a C-alphabet for WrEtcH, and a Y-alphabet for wretCh, summarized by the shifted-alphabet pattern WQCOYC. Shifted alphabet patterns can be studied just like word patterns; for example QUANTIFICATIONALLY, with no repeated letters in its shifted-alphabet pattern, is analogous to DERMATLOGYPICS with no repeated letters. I was much intrigued by letter-shifts such as COLD which, moved three letters along the alphabet, becomes FROG. I generated a taxonomy of all possible shifts, from one to thirteen, for three-letter, four-letter and five-letter words, noting that six-letter words only lacked shifts of lengths 3, 5 and 12. Using Levine’s pattern word list I found only one shift pair of length eight: WILIWILI to COROCORO. Leonard Gordon and Christopher McManus showed how letter shifts could be plotted on lines in an n-dimensional space.

The final part of the fifth chapter was devoted to letter scoring in which A=1, B=2, ..., Z=26 and each word is characterized by the sum of its letter-values. I found such characterizations less interesting than purely alphabetic ones, but balanced words (those with an average value of 13.5) turned out to have interesting geometric properties. Following up on Keith Jones’s 1992 Internet suggestion that the letters of the alphabet could be represented by vectors pointing from the inside cubelet of a 3x3x3 array to each of the 26 outside cubelets, I suggested that words could be geometrically represented by a sequence of such vectors, forming a segmented “worm” in three-dimensional space. For balanced words, the segments formed a closed loop, the last one returning to the center of the cubic array—in effect, a worm biting its own tail. (Tom Day suggested that these be called Ouroboros worms, in honor of a 1922 science-fiction story by E.R. Eddison.) Three-letter Ouroboros worms consisted of 30-60-90 right triangles (ANY, CUP, PAW, TOE), isosceles triangles (KEY, MEW) or equilateral triangles (BOW). Four-letter Ouroboros worms came in a wide variety of shapes, both planar and non-planar, the most interesting being TAXI which traced out two-thirds of the edges of a tetrahedron. Some, like LOVE and BEVY, had degenerate (foldback) sections in which segments traced earlier segments in reverse. The longest-known non-degenerate Ouroboros worms, having neither a foldback section nor an internal intersection, were SEMICONSCIOUS and TRYPANORHYNCHAN. I wondered whether one could find a word corresponding to a knotted Ouroboros worm. The minimum number of segments needed for such a word was apparently nine.

The sixth chapter, on word groups, covered my favorite topic in logology. The classic work in this field consists of searches for ever-larger word squares, culminating in the collection of perhaps a thousand nine-squares devised by members of the National Puzzlers’ League during the last century. (Most of these are extremely unsatisfactory, using words from obscure references.) With the advent of the computer, systematic searches for all word squares in a word list became possible, and after running his computer for several weeks Eric Albert in 1989 finally found the only one lurking in the pages of the Second Edition of the Merriam-Webster Unabridged Dictionary. I defined the support of a word square to be the size of a randomly-drawn list of n-letter words that would, on the average, yield one square. I devised a scaling formula showing that for large word squares, the support draws an increasingly-sharp line—as the number of words increases modestly, many more squares become likely. Chris Long derived a theoretical estimate of the support under idealized conditions (words formed at random from letters with English-language text probabilities). His support value was more than 60,000 for a nine-square and nearly 250,000 for a ten-square, showing the impossibility of finding the latter using dictionary sources. I discovered variations on the standard word square, for example the
from many small islands to a main network with a dense center and outlying tendrils, accompanied by a cloud of smaller unconnected networks down to isolated words. I examined the detailed structure of the main network in terms of the vowel-consonant patterns of its words, noting that it is often far more difficult to go from one vowel-consonant pattern to another than it is to stay within the same vowel-consonant pattern. In particular, I showed how networks could be characterized by skeletons joining different subnetworks, each with its own vowel-consonant pattern.

In the networks described above, one can always proceed in either direction between adjoining words. In directed networks, this is no longer the case. As a simple example of a directed network, transform one word into another by removing the beginning letter and adding a new letter at the end to form another word (a simple example: nth-the-her-era-rag-age-gem-emu-mug). The structure of such a network is much more baroque. It consists of one or more cores in which any word (called an insider) can be reached from any other. Outside the core, there are starters, predecessors (all words in a string connecting a starter with an insider), followers (all words in a string connecting an insider with an ender), and enders. A final variety, bypassers, form strings which join starters and enders but never access a core at all. Other directed networks consist of words which overlap less than in the above example; one particularly useful one has half-overlapping words.

The final part of the fourth chapter concerned itself with transpositions. I introduced a taxonomy of transposals, showing by example the 397 different ways one six-letter word could be transposed into another. I presented the most transposable letter-combinations for various dictionaries, including Jeff Grant's tour de force of 157 transpositions of the letters AEGINRST, stretching the definition of an acceptable "word" to its outer limits. I searched through endless telephone directories seeking real persons whose first name transposed their last. More than one half of the cases turned out to be GARY GRAY, with RONALD ARNOLD the second most common combination. After the advent of CD-ROM national telephone directories this search became much easier. I constructed a transdeletion pyramid, a set of words starting with ANTICEREMONIALIST in which I repeatedly removed one letter and rearranged the remainder to form another word, ending up with train, rant, tan, at, a. The one dubious word was RECLAMATIONIST, not found in any dictionary, but used in a 1946 Saturday Evening Post article. I pointed out that one could construct the roots and branches of any given word, the roots consisting of all possible repeated transdeletions, and the branches all possible repeated transadditions. (For example, OLYMPIC can be transadded in several different ways, including olympic-olympics-polysomic-polyoecism-compositively as well as olympic-polyemic-polyaemic-polyhaemic-myelopathic-polycythemia.)

The fifth chapter examined letterplay based on the order of the alphabet. An alphabetic sequence in a word is said to be undominated if a word can be found containing all the letters in that sequence, but no word can be found containing a longer sequence including the original one. Three cases can be distinguished: the consecutive alphabetic letters are adjacent and in alphabetic order, are only in alphabetic order, or are not necessarily in alphabetic order. (For example, in the Pocket Merriam-Webster the first few undominated words in the first case are boBCat, aneCDote, DEFt, and aFGHan, in the second case AmBusCaDe, DEFog, prizEFiGHunG, and in the third case FEeDBACK, lIGHt-FaCED and straGHiJacket.) A related diversion consisted of constructing the shortest possible word list containing the alphabet in order or reverse order (for example nAB CoDE Fig HIJack LiMN Op QuRSh TuVes WaXY Zip). One of the largest word-sets I ever collected consisted of 720 words, each one containing a different alphabetical ordering: ALMOST 123456, CHORUS 123465, DEPUTY 123546, ...
proved that there were many undiscovered riches in the logological field. With my extensive knowledge of logology, I was in a better position than most to find them, to build on seemingly trivial tidbits.

The third chapter examined letter-fragments within words. My attention was first drawn to this branch of logology by the previously mentioned dictionary of trigrams. When Edgar Gilbert published a near-complete dictionary of bigrams in the 1969 Word Ways, I took this as a challenge to find examples for all 676 cases. However, I found this could be done only if one admitted place names from the Times Index-Gazetteer and obscure Indian names from Hodge’s Handbook of American Indians North of Mexico. When national telephone directories became available on CD-ROM in the early 1990s, I added a few surnames from this source: ToloDXI, MolyneVX, AFXentiou. This chapter seemed the logical place to present definitive results on the famous -GKY problem of the 1970s and 1980s—various Word Ways authors such as George Scheetz, Murray Pearce and Harry Partridge found nearly 100 of them. More appealing to me were lists of 24 words containing all possible permutations of a tetragram, possible for AIRT and AGIN.

Generalizing compact letter-groups such as bigrams and trigrams, I considered patterns of a given letter distributed throughout a word. The classic question here was: how many of each letter of the alphabet could appear in a word? I looked for other things to do with fragments. I introduced the concept of a cadence, a set of identical letters spaced at equal intervals, such as hUnUl-hUnUnUkUnUkUapuau or EffEvEscEncE. I observed that all six orders of the three letters A, L and F appeared in ALFALFA (ALFalfa, ALFAlfa, aLFaLFa, aLFALFa, aLFaLFa, alFALFa) and generalized this to the 24 orders of L, N, R and T in TRINITROPHENYL-METHYLNITRAMINE. In theory this could be achieved with a twelve-letter word having a pattern such as abcdabcdcba, but I could find no real word satisfying the proper constraints, although names of hypothetical individuals such as ROGER O. GREGOR or ERNIE N. REINER did. There are 3276 ways that three letters can be chosen from the alphabet with repetition allowed. I suspected that most of these could be identified in words, from bAnAnA to ZyZZze; and in fact all but 17 can be recognized in a Merriam-Webster word. However, I could not place isolated results like these in a satisfactory intellectual structure.

The fourth chapter constituted the core of letterplay: the transformation of one word into another. There are two basic ways to accomplish this: by inserting a letter in a word or deleting a letter from a word to form another, or by replacing a letter in a word to form another. The latter is the older device, going back to Lewis Carroll in the form of a word ladder, but the former has the advantage of allowing one, at least in principle, to travel from any word to any other, even one of a different length. For both I introduced the concept of the word network, a structure (often too complicated to diagram on a piece of paper) of points representing the various words, and lines joining those points corresponding to words that can be transformed into each other. These networks have a number of interesting properties in their own right, such as the span. If one defines the distance between any two words in a network as the minimum number of lines one must traverse to go from one to the other, then the span is the maximum value of this distance, taken over all possible pairs of words. In brief, the span characterizes the distance between the farthest-apart pair of words (a simple example: in the Official Scrabble Players Dictionary, the farthest-apart pair of three-letter words is ivy-icy-ice-aye-aye-the-thy-try-fry-fro.) Within a network, I looked for words a minimum number of steps apart which were maximally different—that is, which had no letters in common in the same position (a simple example: settle-settee-setter-better-batter-banter-banter.) By starting with the commonest words in English-language text and adding them one at a time, one could show how networks evolve
The second chapter looked at the various patterns of letters formed by words—not only the well-known palindromes and tautonyms, and the switch words I encountered in 1969, but more subtle ones such as heterograms in which each letter in a word is different, and pangrams in which all the letters of the alphabet are used at least once in a set of words. I was rather proud of my discovery that the latter two concepts imperceptibly shaded into each other, for one could on the one hand look for the longest word, the longest two words, etc. without repeated letters, and on the other hand look for the fewest number of letters in a pangram set of four, five, six, ... words. If the dictionary from which these words are drawn allow a perfect pangram (no extra letters), then both series terminate with this set of words. (In the Merriam-Webster Pocket Dictionary no final convergence is possible, as the heterogram set ends with the 25-letter CHINTZ, FJORD, PLUMBS, GAWKY, VEX, and the pangram set with the single extra A in LAMB, SQUAWK, FJORD, CHINTZ, VEX, GYP.) I was also proud of the concept of the pangrammatic window—the shortest set of n consecutive letters in running text which include the full alphabet. (Finding short pangrammatic windows in literature has become easier with the advent of the computer, but the shortest one, of 65 letters, was found by hand a century ago.) I also devised the pangrammatic highway game: finding the shortest distance along an interstate highway containing permanent road signs having all the letters of the alphabet. New Jersey clearly has the advantage as it is the only state containing a J, but I was still surprised when the shortest such interval, only a quarter of a mile long, occurred on Route 287 South within Morristown (the relevant signs included Washington’s Headquarters, Bridge Freezes Before Road Surface, Entering Morristown, Exit, Lafayette Avenue, and New Jersey Shakespeare Festival).

Gary Bloom, a professor in the Computer Sciences Department of the City College of New York, introduced me to the concept of the eoderdrome in early 1980. Take the different letters of a word and place them on a sheet of paper. Is it possible to trace out segments of a curve which visits the letters of the word in order, without having any segment cross another one? The coinage “eoderdrome” is the shortest possible word for which it is impossible to construct a curve with non-crossing segments. In mathematical terms one is dealing with a graph (a set of points connected by lines), and there exists a famous theorem by Kuratowski which states that all non-planar graphs (that is, ones with crossing segments) can be reduced to either K(5), the complete graph on five points, or K(3,3), the bipartite graph on six points, by eliminating one or more lines, as well as any points joined by only two lines. I discovered that eoderdromes are quite rare, there being approximately 75 Merriam-Webster words that reduce to the bipartite graph, four that reduce to the complete graph on five points, and only two—OVERCONSCIENTIOUSNESS and PHENOLTETRACHLOROPHTHALIN—that reduce to both. I also discovered the shortest dictionary eoderdrome, the 13-letter METASOMATOSES. It wasn’t long before I discovered king’s-move words, those which could be traced out by a king’s move in chess when the different letters were suitably placed on the squares of a chessboard. Words which could not be traced by a king’s move turned out to be closely related to, but not identical with, eoderdromes. In the early 1990s I recast eoderdromes and king’s-move words in terms of word graphs and word tiles, generating a type-collection of all possible word graphs for words of up to five letters. I also generalized king’s-move words to queen’s-move words. Checking words to see whether or not they were king’s-move or queen’s-move was a tedious trial-and-error procedure until Dan Tilique supplied me with a short computer program to find a word tile if it existed. Leonard Gordon looked at word tiles on hexagonal and triangular pavements as well as the standard square pavement of the chessboard, and even words on three-dimensional “pavements” created by letters inscribed on stacked cannon balls! I marveled at the elaborate logological structure that had been created out of Bloom’s original insight. To me, this
"Letterkunde" by "Battus", a pseudonym for Hugo Brandt Corstius. This was a general survey of Dutch wordplay, reprinting articles that for the most part had appeared in the NRC-Handelsblad, the Dutch analogue of the New York Times. With some aid from George, I deciphered the various types of wordplay presented therein. Of course, since much letterplay is independent of language, I was frequently able to determine what was going on by looking at the examples. I eagerly searched for examples of wordplay I had overlooked in Word Ways, but found little. What charmed me most about that book was its organization: each chapter section began with a short discussion of a given type of wordplay followed by lists of examples or short poems and stories illustrating the principle. I decided that this was what my encyclopedia of wordplay needed—a mix of theory with examples and illustrations to leaven the narrative.

Battus's book forced me to define what topics I wanted to cover in my encyclopedia. I created in November 1984 a table of contents, and during the final month of my Bell Labs career I spent quite a bit of time at work writing four-and-one-half chapters, including the preparation of one (Chapter 2) in camera-ready form. This I sent to Martin Gardner in February 1985, who commented "the material for your projected encyclopedia looks marvelous" and forwarded it to one of his publishers, Birkhauser, in Boston. Apparently they weren't interested, for they never bothered to reply. It was a source of some frustration that the Netherlands, a nation of only 14 million people, could support such a book of wordplay whereas the United States, with twenty times as many people, could not.

In defining the scope of recreational linguistics, I realized that words could be regarded as collections of letters to be manipulated, as sequences of sounds, and as carriers of meaning. All three attributes were represented in Word Ways articles, but my personal preference was for the first—I decided that the encyclopedia should be devoted to letterplay. After some cogitation, I organized the material into seven chapters, each more or less organized around a central theme, described in the next several pages. I have emphasized those aspects of the book which I personally researched and developed, and in a few cases I have noted my researches that occurred too late for the book. Thus, I summarize not only the organization of the book, but those things which most excite me in logology.

The first chapter was organized around the challenge of writing intelligible prose with one hand tied behind one's back—either by omitting certain letters as I had done in "Mary Had a Little Lamb" or by always including certain letters such as Mary Youngquist's "I'm living nigh grim civic blight; I find its victims, sick with fright..." I discovered subtler versions of this game, such as texts in which every two successive words (1) had one or more letters in common, or (2) had no letters in common. Howard Bergerson devised a self-replicating acrostic in which the initial letters of a text repeated the text, as in "Midnight intombed December's naked icebound gulf..." This chapter was home to my AEIOU collection, 120 different words containing these five vowels (and no more) in all possible orders, as well as a more open-ended collection of words in which QU was not followed by a vowel, or Q was not followed by a U. I reported on my research on polyphonic ciphers, in which the object was to assign the 26 letters of the alphabet to ten symbols (the digits 0 through 9) in such a way that one could most readily reconstruct the original text from the digital stream by replacing each pair of two successive digits with its most likely letter bigram. (For example, if A,R,M were all assigned to 0 and T,Y,L to 1, then the most likely translation of 01 is AT, though MY would also rate consideration.) Could logology be used to address problems in other fields? I determined that the probability that the initial letters of a six-line speech by Titania in "A Midsummer Night's Dream" would accidentally spell out T,I,T,A,N,I,A was quite small, suggesting this was a bit of wordplay deliberately inserted by Shakespeare.