H. P. LUHN: pioneer of information science

selected works

edited by Claire K. Schultz

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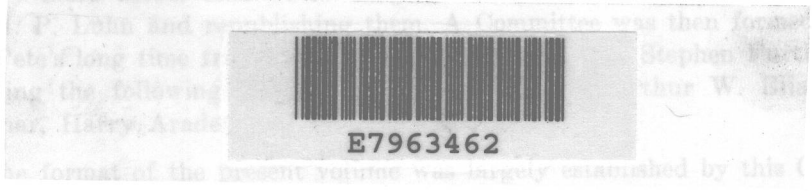
Edited by: Claire K. Schultz

Senior Research Associate
Institute for Advancement
of Medical Communication
Philadelphia, Pennsylvania



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Foreword

When the shock and sense of loss at Hans Peter Luhn's death had diminished a little, many of his friends considered that there should be some form of memorial to him. A resolution was adopted in the ADI Council meeting held at the 1964 Annual Meeting to the following effect:

"Resolved: That, in memory of Hans Peter Luhn, the American Documentation Institute establish a fund to be devoted to the advancement of communication through information science; and be it further resolved, that the Council of ADI authorize the President to appoint a committee to solicit, receive, and administer this fund and to define the specific uses of this fund in pursuit of the general purpose herein stated. Council directed that the above fund shall be known as 'The Fund for Information Science'." (At the December 1964 meeting of the Council, the name of the fund was changed to The Scholarship Fund for Information Science).

Having established the fund, consideration was given to means of obtaining money for it. A solicitation of the membership was made in the ADI Newsletter in March of 1965, but in the meantime, Mrs. Claire Schultz, former president of ADI, had suggested that a Festschrift in honor of Luhn might be an appropriate project for ADI and that income from such a book might be used to endow the Scholarship Fund for Information Science. After a number of informal discussions it was decided that the original Festschrift idea should be modified and that a more useful contribution might be made by collecting all of the works of H. P. Luhn and republishing them. A Committee was then formed, chaired by Pete's long time friend and colleague at I.B.M., Mr. Stephen Furth, and including the following members: Claire K. Schultz, Arthur W. Elias, Gerald Sophar, Harry Arader, and Pauline Atherton.

The format of the present volume was largely established by this Committee who recognized that many facets of Luhn's career should be treated. It was also recognized that the resources of ADI and volunteers would not be sufficient for the task, and in 1965 a request was made through the offices of Stephen Furth, to the IBM Company, for a grant in the amount of $1000 to support the project. The request was favorably received by IBM and the funds were made available to the Committee.

Since 1965 the volunteer editor, Mrs. Claire K. Schultz, and the Committee have worked to assemble the complete bibliography and list of patents, detect equivalent publications, get "perspective" papers written, provide indexes and design the book. For this book we have used the only known example of typography specifically chosen by Luhn, that used in his design of *American Documentation.*

As Chairman of the ADI Publications Committee and as a participant in this project, let me say that for all who participated that it has been a "labor of love." Any virtues that this book may possess have come from its inspiration.

A. W. Elias
Chairman—American Documentation Publications Committee
Sub-Committee on the publication of the works of H. P. Luhn

Acknowledgements

The help and good wishes of many people have assisted preparation of this volume. First thanks go to Hans Peter Luhn's close friend, Stephen E. Furth, who obtained $1000.00 through International Business Machines Corporation to defray cost of manuscript preparation. Throughout preparation of the volume, Mr. Furth was available to expedite any task for which personal or IBM cooperation was needed; he aided many of the editing tasks materially.

Mrs. Genevieve Luhn, Hans Peter's widow, and Kurt Luhn, Hans Peter's brother, were most gracious in making materials and information available.

In alphabetical order, Mr. Robert Fairthorne, Mrs. Helena Moore and Miss Mary Elizabeth Stevens, have the gratitude of the Luhn family as well as the ADI Publications Committee for their unselfish response to a request to write "perspective" papers about Hans Peter Luhn's work.

Mr. Arthur Elias supplied editing know-how and chose the typefont for this publication; he also obtained the necessary clearance for publications reprinted in this volume.

Several of my graduate students, especially George Makovetz, Jacques Tocatlain, Jacqueline Morelock and Louise Walsh, helped with preparation of the Luhn bibliography and list of U. S. Patents. Several local librarians helped to check references for the Partial Citation Index, especially Mrs. Roberts, Univac Division of Sperry Rand, and Reginald Smith, Institute for Advancement of Medical Communication. Reginald Smith helped with many bibliographic "chores," throughout.

Thanks too, to my secretary, Mrs. Mildred Kriebel, who not only typed the manuscript, but helped to compile the citation index.

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Part 1—Biography

H. P. Luhn, The Man

Claire K. Schultz
Institute for Advancement of Medical Communication
Philadelphia, Pennsylvania

PROLOGUE

The week before Hans Peter Luhn died he and I had a last supper together in his favorite French restaurant in Washington, D.C., L'Escargot. It was a joyous occasion, with Pete speaking fluent French with the waiter, Maitre D' and wine steward, all the while. He had arranged to spend the evening recounting his biography for me, because he had been told he was to receive the Delaware Valley Chapter, American Documentation Institute, Award of Merit, in October, and that I was helping to arrange the presentation. Much of what is recorded on the following pages is part of the story he told me that evening. I did not record any of it until the next morning, and then only fragments, but some of what he said was burned on my memory, and the phrases that I feel certain were his I have placed in quotation marks in what follows.

THE FORMATIVE YEARS

Hans Peter Luhn was born in Barmen, Germany, July 1, 1896, the first child of the noted printer,* Johann Peter Luhn. His boyhood years brought him into constant contact with the printing trade because the family home was close to the family business. As was the custom with the eldest son, Hans Peter was expected to become a printer.

Apparently he took this occupational responsibility seriously until he reached early manhood, to the point of having completed a printer's apprenticeship; but as a youngster, his inventive mind had him using the house's lead for more boyish devices. His favorite early memory was of the miniature railroad he and his younger brothers,** and some cousins, built and maintained during their childhood. Hans Peter was chief engineer in these activities, beginning at approximately age 15. Materials for the railroad included printers' lead, melted and remolded into rails. The first setting, with 240 feet of track, was the garden; the indulgent sponsor was Hans Peter's father. Father Luhn urged advance notice of the original railroad's completion, so he could arrange a garden party to which the prominent townspeople would be invited, as witnesses to this important family achievement. Hans Peter reported that his ambitious schedule caused him anxiety; he had to work until the last minute to get everything operating satisfactorily. However, he was successful, and the townspeople were duly impressed. After two summers of fun with the railroad, his next challenge was how to move it indoors for year-round activity; that challenge was met in 1913, much to the delight of the other boys.

Another of Hans Peter's memories was of the family puppet theater, which he enjoyed helping to operate. He described it as having several levels on which a drama could unfold; the multiple stages allowed scenery to be changed in the unused portions; thus, the action could move from stage to stage as required. One of the difficult stage-management tasks was that of swift lighting changes. Hans Peter accepted the stage lighting as his major assignment and designed a switching panel controlled by punched cards which programmed the lighting for each performance. The panel contained 20 contacts arranged in a straight line about 24 inches wide. Openings were cut in the program card for each contact or contacts which were to be "on" at any given moment. As lighting

* Hans Peter's father was known throughout Germany for the quality of his printing, also for his pioneering color work in cooperation with the Lumière Brothers of France.

** Klaus, Horst and Kurt.

changes were required, the card was pulled through the contacts for each subsequent lighting arrangement. This was his self-introduction to punched cards and to the automation of processes. His ingenuity intrigued the other members of the family, and, in retrospect, seems to have been a sure signal of the kind of career for which Hans Peter was suited.

From 1902–1913 Hans Peter attended elementary school and gymnasium (High School) in Barmen. In 1913 he went to St. Gallen, Switzerland, where he served as an apprentice, without pay, in the famous printing establishment of Zollikofer. He met and made friends with many of the students from the St. Gallen Hochschule, but his stay in St. Gallen was interrupted during 1915–17 by the need to serve the German Army, which he did as a communications officer, with assignments in France, Romania, Bulgaria and Turkey. According to his brother Kurt, Hans Peter's peaceful nature made him dislike intensely even this association with the war.

From 1918–20 he continued his education at St. Gallen, taking courses in technology, physics and accounting, because, he said, he became aware of the slim chance that his father's business would be turned over to him in the forseeable future. During this time he also worked on a design for a double-entry bookkeeping machine which recorded a transaction on both credit and debit account cards, held on a cylinder; this "Bi-Luhn" accounting machine design was never completed because Hans Peter became acquainted with the Hollerith machines then gaining prominence.

From 1920–23 Hans Peter was Assistant Manager of a textile mill in Italy, the name of which is given in his papers, in abbreviated form, as Soc. An. Nastri & Treccie. In 1923–24 Hans Peter lists himself as a free-lance designer, apparently still associated with the textile field, which his brother reports was booming at that time, forming combines all over Europe. In February 1924, acting as an agent for a German textile firm, Hans Peter entered the United States at Boston Harbor, with an assignment to investigate favorable locations for European-sponsored mills in the United States.

In his verbal account of this period, Hans Peter said an arrangement had been made for him to receive funds through a textile company in New York City. At the end of his first week in the United States he presented himself at that place and asked to be paid his salary. The reception was a bit cold because the New York company said there had been no word of this from Germany, but they paid him anyhow. When he returned the following week, he was told that investigation showed the German firm to have become bankrupt since Hans Peter's arrival in the United States.

This news left Hans Peter alone and jobless in a foreign country, but not without his ever-present ingenuity. He said his first thoughts were of money and that this "Naturally led me to think of banks." What could he do to legitimately obtain money from a bank? Perhaps he could persuade someone to make use of his language facility in German, French and Italian? He reported having gone through "one revolving door after another" looking for a job as a translator. Finally he was successful and was told to come to work the following Monday morning. When he did, he found that a relative of the bank's president had unexplainably obtained the job. In his desperation, however, he learned that there was an opening for a bank clerk. His cunning response was, "Why, that is exactly what I am best qualified to do." According to his own amusing account this is what followed: for three days he had a tutor; the job consisted of recording the day's receipts, totaling them at the end of the day, verifying the total with a second person, and going home at 3:30 p.m. Clearly, he said, this was a simple job. On the fourth day, his first to work alone, he could not get his total to verify; he did not get home until 3:00 a.m., meanwhile missing a date with a young lady whose acquaintance he had made. The next day was equally frustrating. However, he said, it was not long until he "learned to add flawlessly" and began a meteoric rise from "plush" to "plusher" offices, serving as a financial secretary.

From 1924–27 he lists himself as a financial secretary at International Acceptance Bank, on Wall Street, in New York City. He was thrilled to remember this portion of his life. He described himself as "one of the four most-eligible-bachelors" among the monied set during those gay '20's. The other three "most-eligible-bachelors" were his best friends; the four of them are shown (Photo 1) in their typical costume of that period which Hans Peter called "1001 tuxedoed nights." The four remained friends throughout life; one of them Gustave Staude, is shown (Photo 2) in a snapshot at a private party in the Luhn home during the later part of Hans Peter's life. Early in 1927 Hans Peter was approached by the President of the Textile Machine Works in Reading, Pennsylvania, about the possibility of becoming his assistant and

once again indulging his inventive proclivities on behalf of the textile industry. This "darling of Wall Street" consented, and soon maneuvered his three friends into positions just as lucrative as his own, in Reading. Hans Peter's assessment was: "with my good friends there we had an enjoyable time all week, but especially on weekends, which we spent with the New York set." Apparently hard play was matched by hard work, because during the three years, 1927–30, Hans Peter accumulated 10 patents for innovations related to textile manufacture.

The Lunometer, which is still being manufactured in the United States and Germany, is a simple, widely-used device, about the size and shape of an ordinary slide-rule, for making instant thread counts on fabric.* Another of the ten inventions was a punched-paper-tape method of controlling every change to be made during the course of knitting and shaping a woman's silk stocking. This invention automated the knitting process, with some resemblance to the way Jacquard automated the weaving of rugs, with punched cards. A third invention got rid of rings in silk stockings by twisting three raw-silk threads together in advance of knitting, to average the unwelcome, but natural, variation in thread thickness.

THE MATURE YEARS

On December 21, 1929, in a Park Avenue wedding, Hans Peter Luhn married Margaret Herreshoff. During the summer of 1930 Hans Peter accepted what he then considered an irresistible offer to become associated with a newly formed company pioneering the development and manufacture of tissue handkerchiefs. However, this turned into a frustrating three years, 1930–33, in Shamokin, Pennsylvania, at Cellulose Products Corporation, in a position identified by him as a manufacturing "Officeship."

In 1933 Hans Peter established H. P. Luhn & Associates, an engineering consulting firm for mechanical and electrical designing, in New York City. By then, two of the three Luhn children, Diana and Peter had been born. Christopher was born in 1936. It was through the offices of H. P. Luhn & Associates that William Maxen developed the computing gasoline pump, a device which all of us take for granted at gasoline stations today. Hans Peter's personally held patents during the 1929–41 period include an inexpensive foldable raincoat, a game table, a cocktail-oracle recipe-guide (which interests information retrieval specialists as an early application of the optical coincidence principle of searching) and a miniature modular building kit, used to construct three-dimensional scale-models of houses and furnished rooms.

His patents are conclusive evidence of his inventiveness and the wide range of his interests. His mind seems to have applied itself to nearly everything with which he came in contact, but not all of his inventions during this period were for the things of everyday life. He was quite concerned about the need for better computing devices in many spheres of activity, and had begun work on counting and control mechanisms activated by electricity. It was with these that he was able to discuss common interests with Thomas J. Watson, Sr., in 1941, when he was asked to join the International Business Machines Corporation, as a development engineer.

The move to IBM took the Luhns to Armonk, New York, where Hans Peter had a large New England clapboard home built on a lovely wooded property. The home was christened "Windy Hill" (Photo 3) and was the setting for the rest of Hans Peter's many-faceted existence. It was also home for Hans Peter's brother Kurt,** a nephew, and from 1949, when he brought her to this country, for his mother. When Johann Peter Luhn died in Barmen in 1948, Hans Peter made arrangements for his mother, Emmy, to have an apartment at "Windy Hill," which she still occupied, in good health, at the time of his death.†

Members of the family bear testimony to Hans

* This device, U.S. patent 1,831,536, was erroneously reported in *Information News,* March 4, 1965, as the Luhnometer (sic); a device for measuring yardage of cloth. This error occurred through a misunderstanding on the part of this author.

** Kurt Luhn gives the following details: "'Windy Hill' was the culmination of many years' planning and dreaming. Pete wanted a comfortable home in a rural setting. A tract of 6 acres was bought in 1938; some adjacent acreage was added over the years. There followed almost weekly visits to the tract to explore every square foot of woods, meadows and rocky ledges until the ideal situation for the house was chosen. Ground was broken in late 1939 and a house-warming party attended by friends and neighbors 'launched' the finished house in the early summer of 1940."

† Mrs. Emmy Luhn, who turned 91 on March 18, 1967, stresses that Hans Peter was always a positive person, even as a boy. For example, when he was a child he wouldn't say, "Help me look for—"; instead he would say, "Help me find—." She says he always looked for the *good* qualities in people and deemphasized anything negative.

Peter's happy generous nature, and to his concern for the welfare of every friend and relative. He helped to bring quite a few people to America to live, so they could enjoy the country of which he had proudly become a citizen. Probably the greatest sadness in his life was that caused when his wife, Margaret, decided to leave him in the mid-1940's, taking the children with her to California to set up a new household there. Later, in spite of a 1948 divorce, he did everything he could to make it possible for his children to return to him if they should ever desire to do so. Each of them eventually did reestablish a warm relationship with their father, and many persons who knew Hans Peter during his later life will remember the pride and happiness he had in his grandchildren. When he was traveling he never missed an opportunity to visit his children. I remember an occasion when he was in Denver for a meeting, and chartered a private helicopter, at $75, to take him to his son's house at Aspen for an overnight visit which he would have missed if he had depended on commercial flights.

In the absence of his family during the 1940's, Hans Peter immersed himself in his job, accruing patents at a phenomenal rate during his first 10 years at IBM. Also, in 1951 he lists that he was a member of several local clubs, and that tennis, skating, mountain climbing and painting were all hobbies at which he was "good." Even though he had a serious interest in his work, and was in the habit of working long hours, Hans Peter was very active physically and socially. He loved parties and in spite of his slim 5′9″ figure, was well-known as both a gourmet diner and a gourmet cook.

Hans Peter's introduction to documentation came in 1947–48. It was the result of James Perry and Malcolm Dyson having approached Thomas Watson about the possibility of an IBM machine for searching chemical structures, coded according to a system of notation Dyson was developing in England.* After having several other engineers in conference on how such a machine might function, Mr. Watson called on Luhn to see what attack he would take. Hans Peter quickly became interested and began work on what, in 1948, he called an electronic searching selector. This machine later came to be known as the Luhn Scanner.** By the time he had two prototype models of this machine under construction he discovered, he said, that there would not be enough coded chemicals to make searching them by machine of any practical value, so far as the general public was concerned. He, therefore, canceled plans for mass production of the machine, but, as was his habit when he was introduced to a problem, he went on to consider from other angles the matter of machines for what he called "literary data processing."

THE GOLDEN YEARS

On April 2, 1953, in New Orleans, Hans Peter made his second, very happy marriage, to Genevieve Taliaferro. They had been acquainted for twelve years. "Gennie" had been a professional singer in her earlier years, and more recently had been a teacher of music at the University of Texas. She brought her lilting ways to "Windy Hill," and spent the next eleven years as a devoted companion to Hans Peter, and as a charming hostess for his many social "occasions," large and small. She encouraged him to indulge his interest in painting, and was successful in taking him away from his newly-found career in Documentation long enough to accumulate a number of interesting water colors, which she blended into the cheerful décor of their home. She says Hans Peter felt that if he had not been successful in technical pursuits he could have developed his artistic ability to a point sufficient to have supported him financially—just one more talent of the many-talented man.

In January 1953 Hans Peter had an article published in *American Documentation,* [B2†] the fiirst publication of his life. He had begun attending meetings of librarians, literature chemists and documentalists, because he was excited about the possibilities of applying machines to "literary data processing" now that he had the scent of this new problem, to which Perry and Dyson had introduced him. Because he was a realist he wanted to understand the problems as well as possible, so he wanted to talk with the people who had a work-a-day concern for them. I first met Pete in the summer of 1953 at a Special Libraries Association Meeting in Toronto, Canada. We met by chance at a social mixer and found so much to talk about that we continued through dinner. I couldn't help noticing his rich baritone voice, elegant man-

* G. M. Dyson, *A new notation and enumeration system for organic compounds,* 1st ed., Longman's Green and Co., London, 1947.

** An article by James W. Perry and Robert Casey in: *Encyclopedia of Chemical Technology,* Interscience Encyclopedia Inc., New York, 1952, p. 460, describes the principle of the Luhn Scanner. Mrs. Moore, this publication, also describes it more fully.

† B keys a reference to an item in the Luhn bibliograhy, beginning p. 287.

ners and immaculate grooming; but most of all, I was struck by his intelligence and his interest in Documentation. There were very few culturally polished people interested in Documentation in those days, and those few who claimed interest in the field tended to want to be King of it. They considered others who professed to be documentalists their natural enemies, to be fought off, or at best ignored; not so with Pete.

I have taken the liberty of printing here (pp. 7-10) the four letters Pete and I exchanged just after we met, for several reasons: the first is to document some of his interests at that point in time, the second is to demonstrate that once in a while he did write a letter (those of us who knew him well learned to know him as a telephone communicator), and the third is to show one example (letter of July 20) of his generosity in throwing bouquets, to encourage anyone who in his estimation had a good idea. Oliver Buchanan pointed to this same trait in the tribute he paid Pete at the H. P. Luhn Memorial Meeting of the New York Metropolitan Chapter of the American Documentation Institute on November 14, 1964.*

From 1953 until 1956 Pete continued to invent machines and components for machines, according to his IBM record, but after that Documentation, now called Information Retrieval, became almost a fulltime interest. Some of his Documentation activities on behalf of chemists had been recorded in the magazine, *Chemical and Engineering News* from time to time, beginning in 1948.** The Luhn bibliography (pp.) shows that between 1948–56 Pete managed to squeeze a few technical reports on Documentation subjects between those on engineering tasks. In 1957, and for a short time thereafter, IBM gave him the title: Manager of Information Retrieval. Pete the laboratory-bound inventor suddenly became Pete the international traveler, lecturer and inventor, all rolled into one.

These were truly golden years for Pete; he was enjoying life to the hilt. Everyone who had contact with him between this and the time of his death was aware of his exuberance.

On February 6, 1958, IBM released an announcement of the 704 auto-abstracting technique. During the next several months it was picked up by a number of newspapers and magazines. The

SHARP & DOHME RESEARCH LABORATORIES

WEST POINT, PENNSYLVANIA

July 8, 1953

Dr. H.P. Luhn
I.B.M. Eng. Lab.
Box 390
Poughkeepsie, N. Y.

Dear Dr. Luhn:

I got back to the office yesterday after a vacation trip in Canada and found your manuscript. I have not had time to read it as yet, but I am anxious to get to it.

I am enclosing a rough draft of the manuscript for the new edition of Casey and Perry, which I think will give you an idea of how our system is set-up.

I hope we can compare notes in the near future.

Thank you very much for the hurried but enjoyable dinner in Toronto.

Sincerely,

Claire K. Schultz
Librarian

K

* "Pete listened to my story, . . . patted me on the back and sent me on to try to conquer bigger and better problems by saying, 'Ollie, you have a new concept here. Carry on my friend! Call on me anytime I can help you.'"

** An article in the March 1, 1954, issue of C & E News entitled, "New tools for the resurrection of knowledge" documents the Perry, Dyson, Luhn, American Chemical Society activities prior to this time.

INTERNATIONAL BUSINESS MACHINES CORPORATION

POUGHKEEPSIE, NEW YORK

Address Reply to:
Engineering Laboratory
Box 390
Poughkeepsie, N.Y.

July 20, 1953

Miss Claire K. Schultz, Librarian
Sharp & Dohme
Research Division
West Point, Pa.

Dear Miss Schultz:

I thank you for your letter of July 8 and the manuscript describing your literature recording and searching system.

I am very much impressed by the mature judgement exercised in the design of your system and I wish to congratulate you and your associates on having done an execllent job.

I hope to be able to visit you in the near future to see your system in operation.

Very truly yours,

H. P. Luhn

HPL:mb
encl.

most interesting write-up was in *The New York Herald Tribune* on May 4, 1958, under the byline of Earl Ubell. It is quoted here because it captures some of the dramatic flair and attention to detail which characterized Pete when he was trying to communicate. Clearly, he supplied the details for this account.

> H. P. Luhn inserted a roll of magnetic tape into the big International Business Machines Computer. On it in the form of electrical signals were 2,326 words of an article from the Scientific American on hormones of the nervous system. He pushed a button and the tape began to spin.
>
> As the tape whirred under the pickup magnet, the signals sped into the machine, and, according to a preset circuit, they were routed to radio tubes, tapes, magnets and a thousand other parts of the giant electronic brain.
>
> Three minutes later, the machine's automatic typewriter started clicking. Those four statements represented the gist of the article. The machine had made an abstract.

On May 27, 1958, Pete was in San Jose, California, for the dedication of the IBM Special Engineering Products Division Plant. At this ceremony he unveiled his ideas for a business intelligence, or selective dissemination system (SDI). The San Francisco Chronicle recounts that the speakers for the occasion also included internationally known documentalist, Eric deGrolier, scientist Alan Waterman, and Thomas Watson, Jr. H. P. Luhn was one of the scientists of whom Thomas Watson spoke when he said that day: "These scientists we invested in have paid off more handsomely than we might have expected in our wildest dreams."* At that time Pete was well on his way to having accumulated the largest number of IBM-assigned patents ever issued to an IBM employee, so Mr. Watson could well rejoice in his productivity. In summing up events of the San Jose dedication, the magazine *Product Engineering* declared on June 23: "More than 80 prominent scientists, who met at San Jose, for a two-day conference, agreed to a man that adequate scientific communication is sadly lacking, both in the U.S. and abroad." Apparently Pete's speech reached its audience.

Accounts of Pete's work continued to circulate the globe, appearing now in a Swedish newspaper, then in an Italian newspaper, and another time in

* May 27, 1958, San Francisco Chronicle: "Thomas J. Watson, Jr., who spent $19 million on research the year he took over as president of IBM, opened the conference."

INTERNATIONAL BUSINESS MACHINES CORPORATION

POUGHKEEPSIE, NEW YORK

Address reply to:
Engineering Laboratory
Box 390
Poughkeepsie, N.Y.

August 11, 1953

Miss Claire K. Schultz, Librarian
Sharp & Dohme
Research Division
West Point, Pa.

Dear Miss Schultz:

I thank you for your letter of July 21 which I found upon return from my vacation.

Regarding the description of the IBM Electronic Information Searching System I would like to point out that the equipment discussed is only experimental and that therefore any detail about the organization of information on the cards described is only academic at this moment. Since writing the report we have revised our thinking somewhat and I hope to be able to give you some definite information within the near future.

The question of producing a bibliography is not easily answered if you are thinking in terms of a single record card. The only improvement I can see beyond the method used by you is that the use of readily interpreted code words, recommended for our scanning scheme, will furnish the equivalent of an abstract. Such an abstract will usually furnish the information otherwise expected from the conventional citation of titles.

I am sending you under separate cover a copy of "Self-Demarcating Code Words" which I believe will interest you and which contains words which will assist in rendering coded information more readily intelligible. The preface to the book explains the special properties of the words and how they have been derived. I shall be very much interested in getting your and your associates reaction to the usefulness of these words.

We feel that the use of punched question cards to be inserted into a machine has great advantages over the manual setting of dials which are probably more evident when scanning serially for information involving not only numerals but also letters.

I expect to be in Philadelphia within the next month and shall let you know in advance so that I may have an opportunity to visit you.

Sincerely yours,

H. P. Luhn

HPL:mb

the *Jornal do Brasil*. Edgar Driscoll, writing on the subject of auto-abstracts in the *Boston Sunday Globe* on September 28, 1958, gives some direct quotes from Pete that are interesting for the record. In answer to a question about the possibility of auto-abstracting a book like *War and Peace*, Luhn replied:

> It's a possibility, though we haven't tried it out on novels yet, there's just no demand.

About the machine technique:

> In making its abstracts it can characterize style. One quickly finds out what is just a lot of blah blah. In our experiments we found that the significant factor of articles is very low. The abstracts show them to be very shallow and flat. . . . In dispensing important scientific information, one of the big bottlenecks has been that it takes people time to abstract articles and papers, often there is a timelag of two to four months. That's a heck of a long time.

Pete added that there was the unintentional danger of misinterpretation and distortion by the abstracters. Since their backgrounds and training

SHARP & DOHME RESEARCH LABORATORIES

WEST POINT, PENNSYLVANIA

July 21, 1953

Dr. H. P. Luhn
I.B.M. Eng. Lab.
Box 390
Poughkeepsie, New York

Dear Dr. Luhn:

I have had time to read only once the book that you sent describing I.B.M. electronic information searching, but I think I was able to absorb a great deal of it, for it certainly is a clearly written presentation. To many of your statements I was able to add only a humble Amen, but I had a few question as I went along.

How much information Subjects, authors, chemical compounds, etc.) can be put on one card, using the techniques that accompany the Luhn scanner? You make it clear that trailer cards can be used, but I wondered about the extent of them. I have a personal reluctance to give up the freedom from filing that one has using single cards for a reference.

Another question that you have probably given considerable thought already—What are the chances of incorporating a duplication process, into, or at the end of, the searching procedure so as to be able to produce a useable on-the-spot bibliography? We have our 101 rigged to print the numbers of selected cards and thus produce a bibliography of sorts for our readers, but the "looking-up" is an awkward and laborious climax to the performance of the machine. Input into the system via mark-sensing cards is also laborious, as you know. I am dreaming of the day when our typist can make up a program card and let the machine take it from there.

I am anxious to know more of the encoding technique proposed for your machine. At Toronto you mentioned the use of codes with "intelligence" in a system such as ours. If this is possible I am more than interested.

And now a few comments—with the auxiliary panel we use on our 101 we automatically make broad and specic searches, utilizing every possible logical connective. This is fascinating and most useful in many instances. We are able to make a five facet search with the control panel as it is at the moment. Our turning of dials seems a fairly facile method of selection, but probably not to be compared with the program card you suggest.

I would like to invite you, again, to visit us, if you think there would be any value in a further comparing of notes.

Sincerely yours,

Claire K. Schultz
Librarian

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vary, no two writers produce the same abstract. Machine abstracting, done in a matter of minutes, would release valuable talents of scientific writers, allowing them to work in more creative fields; the possibilities for errors would be eliminated and a single standard for abstracting would be established. "We are merely on the first step in literary abstracting, but enough success has been achieved to warrant further development," Pete commented.

Still later in 1958 came one of the professional highlights of H. P. Luhn's life. It was the International Conference on Scientific Information (ICSI), held in Washington, D.C., the week of November 17. Pete had been on the Program Committee for this meeting, helping to arrange what was the biggest attraction ever held for American Information Retrieval specialists until then. However, Pete was also busily making plans behind the scenes, for a big show on behalf of