ISI Services in the Design of Small-User Systems*

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The Institute for Scientific Information (ISI) provides several services that are useful to the small information groups who constitute the majority of ISI's patrons. The relationship between ISI's existing and future large-scale information systems and "small" user systems is stressed. Services covered include *Current Contents* (CC), Original Article Tear Sheets (OATS), *Index Chemicus* (IC), Automatic Subject Citation Alert (ASCA), and the ISI Search Service.

The designation "small user" was probably conjured up for this symposium to characterize the lone information officer or librarian in a small organization who is responsible for retrieval and dissemination of information, both currently and retrospectively. This would generally include the organization's special files of information indexed according to its own special needs and approaches to research and development.

My concept of the small user is not limited primarily to the one-man information shop in many commercial organizations, but also includes thousands of individual users in academic and nonprofit research organizations where scientists have a consistent and diligent interest in keeping up with the literature, conducting searches, and maintaining special files, particularly reprint collections and collections of specialized data. Indeed, these small users are the specialized information centers of which so much was said in the Weinberg report (*1*).

Consequently, my enthusiasm for this subject is due to the fact that ISI derives the majority of its income from small users, a fact which may come as a surprise to many of our "large" users.

ISI provides at least 10 different services, each of which is in some way related to the other. I shall treat them in their historical order and then mention a few new services.

The "old" stand-by, *Current Contents of Chemical, Pharmaco-Medical and Life Sciences* (Figure 1), is used by hundreds of technical information officers, among other reasons, as the simplest and most economical solution to the journal routing problem. Over 10 years ago, such large organizations as Lederle and Merck realized the high cost of routing large numbers of journals. Though *CC* has not eliminated journal routing, it has cut it down to meaningful proportions and in fact, actually increased the *use* of journals. Not a single journal, to my knowledge, has had a loss of circulation through *CC* coverage.

CC circulation continues to grow, and its readers seem to have an insatiable appetite for covering new journals. This does not appear to affect the process we traditionally call "browsing." People like to read headlines. But there are technical information officers who scan each and every title in *CC* because there are fields of interest for which there are titles which cannot be reasonably anticipated by word, citation, or other indexing systems.

Current Contents of Space, Electronic and Physical Sciences (Figure 2) is used by many more small science and engineering companies than is the Life Sciences Edition. The reason for this is the large number of firms in these fields, often without good library facilities. Since all ISI services are backed up by an Original Article Tear Sheet service (OATS), this makes *CC* a good invest-

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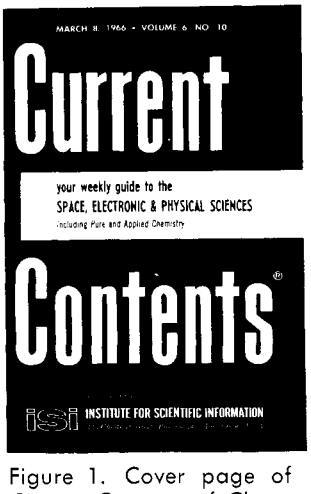


Figure 1. Cover page of *Current Contents of Chemical, Pharmaco-Medical and Life Sciences.*

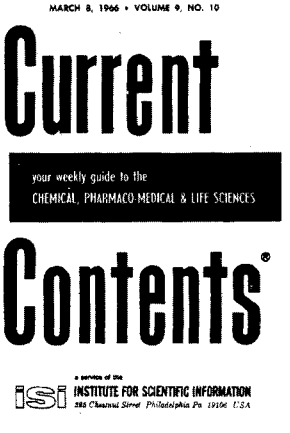


Figure 2. Cover page of *Current Contents of Space, Electronic and Physical Sciences.*

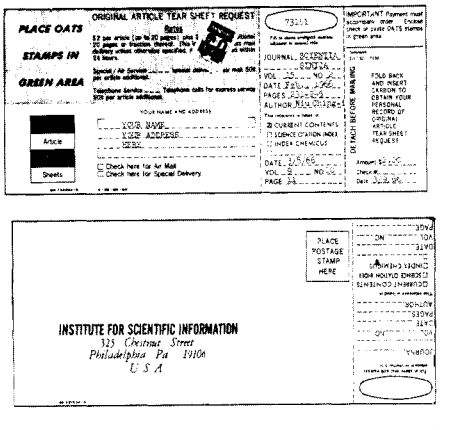
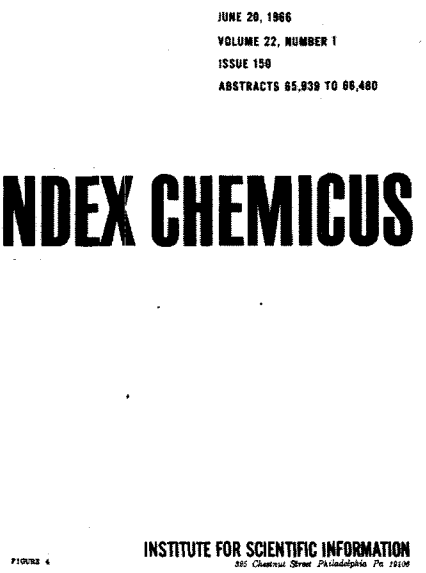


Figure 3. Sample OATS request card showing use of stamp for payment.

ment for a small firm (Figure 3). However, we do not limit OATS service to *CC* customers, most of whom rely on their own libraries or write to authors for reprints anyhow.

Why should a "small" user buy *Index Chemicus* (Figure 4)? The reason he buys any seemingly expensive service is simple—he could not obtain similar information at a comparable cost in time, energy, or money. It is difficult to place a monetary value on timeliness. *IC* publishes detailed abstracts, together with the corresponding indexes, an average of seven weeks after appearance of primary publication. *IC*'s graphical abstracting approach can save the user much of the time required to read or scan a conventional abstract. *IC*'s selectivity and compactness are considered a virtue by most users. Small users rarely measure the time and cost of a search for a particular compound in a molecular formula index. A search in *IC* is rapid. We also offer *IC* custom searches through files of 600,000 compounds for $25 for the first hour, and $10 per hour for each succeeding hour.


JUNE 20, 1966
VOLUME 22, NUMBER 1
ISSUE 156
ABSTRACTS 65,939 TO 66,480

INDEX CHEMICUS

INSTITUTE FOR SCIENTIFIC INFORMATION
3501 Chestnut Street Philadelphia Pa 19104

Figure 4. Cover page of *Index Chemicus*.

Many small users use *IC*'s registry numbers as a unique means of identifying compounds in their files and for retrieving *IC* abstracts. Others have obtained our permission to prepare special selective bulletins—*e.g.*, all abstracts covering alkaloids—and to reporduce the abstracts on 5″ × 8″ cards for filing by the lab man at his own desk (Figure 5).

Just as *CC* is sometimes used in lieu of routing over 5600 different journal issues per year, *IC* is sometimes used in chemical research organizations for current awareness in lieu of scanning journals. Extra copies of *IC* are charged at essentially the cost of printing. Extensive analysis (2) has shown that about 100 chemical journals, out of more than 1000 journals screened by *IC*, account for 98% of the reports of new chemical compounds. But even this "small," select group of journals cannot be routed conveniently to an individual for screening, or even to the one-man technical information department which can afford to purchase these journals.

A major activity of the small technical information department is selective dissemination of information. This is a service much appreciated by busy individuals in research, development, and marketing. Here again, ISI's services to the small user are unique. In the Automatic Subject Citation Alert (ASCA) system (3), each scientist or organization prepares a profile of interests as shown

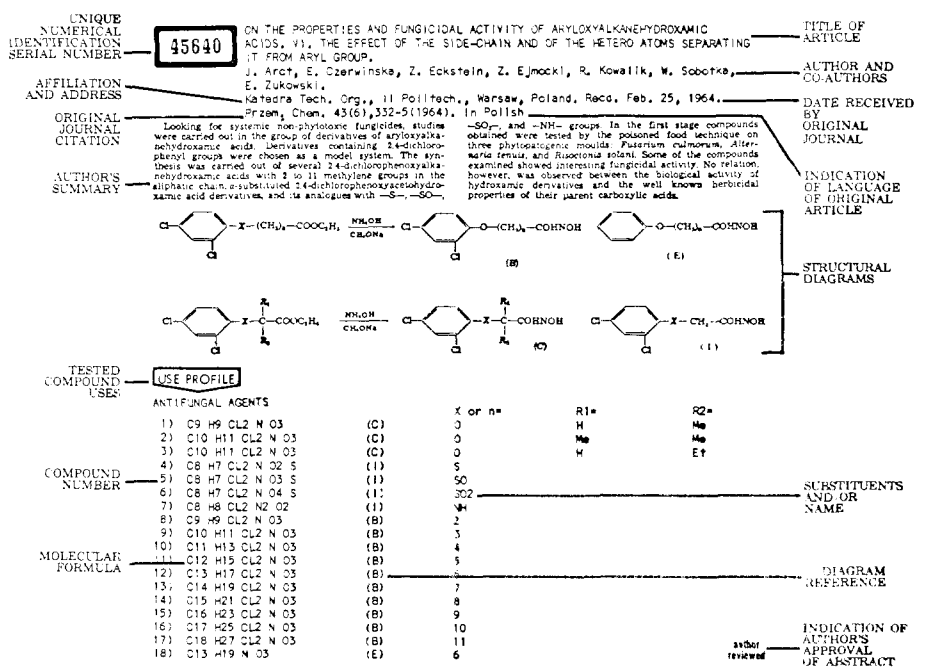


Figure 5. Typical entry from *Index Chemicus*.

in Figure 6. The profile is used in the ASCA computer system to select, on a weekly basis, the pertinent literature currently appearing in over 1400 journals which publish about 250,000 items per year. Naturally the leading chemical journals are included. In special circumstances, it may be desirable to construct a joint profile. In such cases, the staff information scientist prepares the profile and codes each question so that the weekly report indicates for whom each citation is intended (Figure 7). Thus the information manager can quickly screen the weekly ASCA report and use the second copy he receives to alert individuals to pertinent items. He can use the back of the report (Figure 8) to order tear sheets from ISI, and/or add new search terms to the profile.

An optional modification of ASCA is ASCAMATIC, which includes tear sheets sent automatically together with the ASCA report. ASCAMATIC saves the task and delay of ordering tear sheets, interlibrary loans, or the time and cost of making Xerox copies. In the near future, ASCA will accept word profiles as well as citation profiles. This new search capability is now being tested with selected small users and will be reported separately.

An important ASCA profile question which is frequently handled by the information officer is the corporate or organization question (Figure 9). Many find it useful to enter the name of their own organization. One might think they could get such information from their own scientists. However, this is not as easy to monitor as one would like to believe.

ISI also provides magnetic tapes of its various files. The average small user probably cannot afford these tapes, which cost from $5000 per year upwards. However, one or two "small users" plan to use these tapes for certain sociological and historical studies that would otherwise be impossible without these files. In these cases, the tapes provide the raw data for the studies.

The new ISI Search Service is a boon to the small user whose budget cannot support acquisition of tapes or even the printed volumes of the *Science Citation Index*. He could make a comparable search at any public library that subscribes to *SCI*. However, there are certain data files available exclusively at ISI, such as our 1960 file. In the ISI Search Service the client supplies us with one or more starting references (Figure 10). We search the *SCI* files according to his instructions at the same rates as for *IC* custom searches.

We send several types of 3″ × 5″ cards in response to a request (Figure 11). When the client is not familiar with the *SCI* system, we will devote a portion of the search time to obtaining one or two starting references. With this service also, the client has the option to receive tear sheets automatically at $2 per tear sheet, or he can send in an OATS card.

As the volume of these searches increases, we will

ASCA ACCOUNT # 783

ASCA (Automatic Subject Citation Alert) PROFILE ENTRY FORM

Institute for Scientific Information
325 Chestnut St., Philadelphia, Pa. 19106

PROFILE FOR
Name XYZ RESEARCH INSTITUTE

ISI INVOICE # _____

PLEASE TYPE

		NAME & INITIALS OF FIRST AUTHOR	JOURNAL BOOK TITLE, PATENT OR REPORT NO.	VOLUME	ITEM'S FIRST PAGE	ITEM'S LAST PAGE	YEAR	ASCA UNITS
RLK	1	Jensen, F. C.	PROC. N.A.S. U.S.	51	53	59	64	1
	2	Zilber, L. A.	VOPR. VIRUSOL.	2	239		57	1
	3	Ahlström, C. G.	J. EXPTL. MED.	115	839		62	1
	4	Ahlström, C. G.	ACTA PATHOL. MICROBIOL. SCAND.	S154	127		62	1
	5	Ahlström, C. G.	ACTA PATHOL. MICROBIOL. SCAND.	58	177		63	1
SPW	6	Zilber, L. A.	J. NATL. CANCER INST.	26	1295		60	1
	7	Munroe, J. S.	SCIENCE	140	1415		63	1
	8	Svoboda, J.	FOLIA BIOL. (Prague)	9	329		63	1
	9	Bergman, S.	ACTA PATHOL. MICROBIOL. SCAND.	S154	130		62	1
	10	Hayflick, L.	EXPTL. CELL RES.	25	585		61	1
	11	Jensen, F.	PROC. N.A.S. U.S.	50	343		63	1
GM	12	Fernandes, M. V.	PROC. AM. ASSOC. CANCER RES.	4	19		63	1
	13	Koprowski, H.	J. CELL. COMP. PHYSIOL.	59	281		62	1
	14	Temin, H. M.	VIROLOGY	8	209		59	1
	15	Hanafusa, H.	PROC. N.A.S. U.S.	49	572		63	1
	16							
	17							
	18							
	19							

Number of ASCA units this page 16
Carry over to page 2

FIGURE 6

5-15-75-110

SEND WHITE COPY TO THE INSTITUTE KEEP GREEN ONE FOR YOUR FILES

Figure 6. Sample of ASCA profile.

a service of the **INSTITUTE FOR SCIENTIFIC INFORMATION**

XYZ RESEARCH INSTITUTE
PHILADELPHIA, PA. 19104

783 ACCOUNT NUMBER
38 UNITS USED
12 UNITS REMAINING

REPORT FOR 3 DEC 65

71,587 citations from current scientific literature and current patents were processed for *ASCA* this week

THE ITEM BY AHLSTROM CG RLK ACT PATH SC S154 127 62
THE ITEM BY AHLSTROM CG RLK ACT PATH SC 58 177 63
THE ITEM BY AHLSTROM CG RLK J EXPTL MED 115 839 62
THE ITEM BY HANAFUSA H GM PROC NAS US 49 572 63
THE ITEM BY MUNROE SPW SCIENCE 140 1415 63
THE ITEM BY ZILBER LA SPW J NATL CANC INST 26 1295 60
THE ITEM BY ZILBER LA RLK VOPR VIRUSOL 2 239 57
CITED BY RABOTTI GF ANDERSON WR SELLERS RL
( ) NATURE 206 946 65 30R N4987 64792
ONCOGENIC ACTIVITY OF MILL HILL (HARRIS) STRAIN OF ROUS SARCOMA VIRUS FOR HAMSTERS

THE ITEM BY JENSEN FC RLK PROC NAS US 52 53 64
THE ITEM BY KOPROWSKI H GM J CELL COMP PHYSIOL 59 281 62
CITED BY NICHOLS WN HENEEN WK
( ) HEREDITAS 52 3 65 24R N3 63100
CHROMOSOMAL EFFECTS OF ARABINOSYLCYTOSINE IN A HUMAN DIPLOIS CELL STRAIN

ACCT NO 783

Figure 7. Portion of weekly ASCA report.

a s c a RETURN

Please print or type below any items to be added to profile.

NAME & INITIALS OF FIRST AUTHOR	JOURNAL BOOK TITLE PATENT OR REPORT NO.	VOLUME	ITEM'S FIRST PAGE	ITEM'S LAST PAGE*	YEAR	ASCA UNITS
Ulbricht, T.L.	CHEM. IND. L.		43		66	1
Smith, A.E.	NATURE	209	74		66	1

*Please include if known

Your basic ASCA subscription provides for up to 50 units. Count one unit for each specific citation request (an article, book, patent, etc.) and fill in entire line. Count 10 units for each author request (where you wish to be notified of citations to any work in which a specified individual was first author) and only fill in author's name and initials. The number of units remaining in your present subscription is printed near the top of the reverse side. This form must be accompanied by payment (cash, check or OATS stamps) of $2 for every unit added in excess of a grand total of 50 units.

PLACE OATS STAMPS
HERE WHEN ORDERING ORIGINAL ARTICLE TEAR SHEETS
AND WHEN NEW CITATION REQUESTS EXCEED UNITS REMAINING.

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Rates

$2 per article (up to 20 pages) plus $2 for each additional 20 pages or fraction thereof. This includes first class mail delivery unless otherwise specified. All orders shipped within 24 hours.

Special / Air Service ——— special delivery or air mail 50c per article additional.

Telephone Service ——— Telephone calls for express service 50c per article additional.

☐ Check here for Air Mail
☐ Check here for Special Delivery

Figure 8. Reverse side of weekly ASCA report.

transfer the searches to our computer facility, but the client will not notice any significant change except for the typography. Presently, he receives an actual clipping from the *SCI* itself; in a computer search, the format would be similar to that of an ASCA report.

An important problem among small users is the maintenance of specialized files. Consider the typical *CC* reader, and you have a scientist who may have developed, over a five-year period, a reprint collection containing from 2000 to 10,000 papers. Many ISI clients have rather elaborate edge-notched, punched-card systems; others are using computers, and this will increase as time-sharing on computers is increased.

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DR. KARL A KIRSCH                          M7796
ELECTROMETRICS, INC.                         43
RESEARCH DEPT., PHYSICS SECTION               7

SAN FRANCISCO, CALIF.  35568


REPORT FOR 22 OCT 65
78,330

THE ITEM BY MOORE CE          467 NAT BUR STAND CI     1       49
 CITED BY  KUCK KL      MANDL F
           P PHYS SOC     86  501 65        18R   N551P3 68398
             A NARROW RESONANCE IN ELASTIC SCATTERING OF
             ELECTRONS BY HELIUM

THE ITEM BY DAILEY BP         J CHEM PHYS             23  118 55
THE ITEM BY DAS TP            SOLID STATE PHYS   S     1  151 58
THE BOOK BY TOWNES CH         MICROWAVE SPECTROSCO            55
 CITED BY  LEHRER SS     OKONSKI CT
           J CHEM PHYS    43 1941 65        49R   N6      68377
             NUCLEAR QUADRUPOLE RESONANCE AND BONDING IN
             CRYSTALLINE AMMONIA

REF AUTHOR  BRIDGES WB        APPL PHYS LETTERS       3   45 63
 CITED BY  BRUNET H
           APPL OPTICS    4 1354 65    L    5R   N10     68413
             LASER GAIN MEASUREMENTS IN A XENON-KRYPTON
             DISCHARGE

(SOURCE AUTH) SCHROTER EH
PUBLISHED  SCHMAHL G     SCHROTER EH
           Z ASTROPHYS    62  143 65        11R   N2      68506
             DIE LI-HAUFIGKEIT UND ISOTOPENVERHALTNIS
             LI6/LI7 IN SONNENFLECKEN

ORGANIZATION CAL I TECHN MOUNT WILS PAL OBS
PUBLISHED  KRAFT RP
           ASTROPHYS J  142  681 65        49R   N2      68593
             STUDIES OF STELLAR ROTATION .I. COMPARISON OF
             ROTATIONAL VELOCITIES IN HYADES AND COMA
             CLUSTERS

ORGANIZATION CAL I TECHN MOUNT WILS PAL OBS
PUBLISHED  KRAFT RP       WRUBEL MH
           ASTROPHYS J  142  703 65        16R   N2      68593
             STUDIES OF STELLAR ROTATION .2. EFFECT OF
             ROTATION OF COLORS AND MAGNITUDES OF A- AND F-
             TYPE STARS IN HYADES

  (ASSIGNEE) SOC MOB OIL
 (PAT CLASS) 167/22
PUBLISHED  WILSON JH      SOC MOB OIL
           3210244 US          65    P    5R   OCT  5
             CL167/22 METHOD FOR CONTROLLING INSECTS WITH
             ORGANOPHOSPHORUS COMPOUNDS

ACCT NO D6679
```

REQUEST FOR ISI SEARCH SERVICE

(A) I know these works are pertinent to my research.
Please tell me what has happened since ☐ in 1964, ☐ in 1965, ☐ in 1966.

	NAME & INITIALS OF FIRST AUTHOR	JOURNAL BOOK TITLE PATENT OR REPORT NO.	VOLUME	ITEM'S FIRST PAGE	ITEM'S LAST PAGE	YEAR
1						
2						
3						
4						
5						
6						

(B) I know these authors are authorities in their fields.
Tell me what items have cited their works ☐ in 1964, ☐ in 1965, ☐ in 1966.

	NAME & INITIALS OF FIRST AUTHOR	DESCRIPTION OF AREA OF INTEREST
1		
2		
3		
4		

(C) Tell me what these authors have published ☐ in 1964, ☐ in 1965, ☐ in 1966.

	NAME & INITIALS	DESCRIPTION OF AREA OF INTEREST
1		
2		
3		

(D) Tell me what current items have been published by scientists in these organizations ☐ in 1965, ☐ in 1966.

	NAME OF ORGANIZATION	DEPARTMENT
1		
2		

TOTAL MAXIMUM HOURS AUTHORIZED FOR SEARCH _____
TOPIC OF SEARCH _____

☐ Send me ISI Search Specification Forms. ☐ Bill me ☐ Purchase Order enclosed.

Figure 10. ISI Search Service form.

ISI has a number of plans in mind that will completely eliminate a lot of duplicate effort in key-punching, computer processing, etc. The go-ahead on these systems awaits several developments, of which the "critical mass" of our citation files is one. As each year passes, the percentage of source items in our clients' files that is anticipated by ISI source tapes increases. At some critical mass, we will reach the point where we can efficiently provide a number of unique services at a lower cost than he could provide himself.

Approximately such a service was discussed by Tukey when he described the "Information Ledger" (*4*). This is a personalized index giving each scientist or small-user organization fingertip access to a combined word-citation index, periodically updated. In combination with ISI's future random access system, what more can the small user want? He might want to add his own personalized indexing entries, or source documents not yet encompassed by our system. He may wish to add his own call numbers or document accession numbers, or even wish his own abstracts or annotations. The "information ledger" that ISI will be able to provide would be vastly more useful than any index based purely on his own limited set of source documents.

For those who are interested in other approaches, such as microfilm, this was treated recently (*5*), in a paper which included a review of the relative advantages of magnetic tape, microfilm, and printed books for large indexes such as the *SCI*. Microfilm systems will certainly give the small user powerful searching capabilities when space is at a premium (*6*). ISI has stored its files on

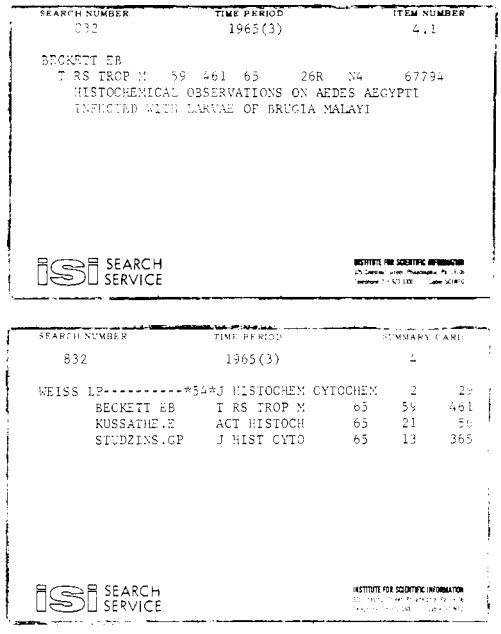

Figure 11. Sample search report cards.

microfilm for many years. Microforms generally can only be effective when really large files of data are involved.

In conclusion, there are a large variety of ISI services that cater to the small user. They begin with a tear and go all the way to a comprehensive tape leasing service. In the future we are planning telecommunications links for a real-time random access file covering over ten million reference and source citations. These services will probably not be cheap by conventional standards; but by the time such facilities are widely used and accepted, even by small users, they will not only seem cheap, but will, in fact, be low in cost because increased volume of usage will decrease costs.

As the appreciation of information services increases, and there is evidence this is happening, their use will probably increase exponentially, and the unit cost of storage and retrieval will go down. ISI services have been priced on a self-supporting and unsubsidized basis. Therefore, barring a completely unexpected increase in the world's literature, or great inflation, our charges will remain stable or go down. *Current Contents*, for example, has not had a price change in nine years despite the substantial increase in the literature covered and the improved features that have been added. Recently we lowered the price of *Index Chemicus* second copies. We have increased coverage in all our services without price increase. To the small user trying to plan a system and a budget years ahead, this is important.

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The Impact of the National Library of Medicine on the Small Information Group*

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Received May 31, 1966

The problems of the small information group in using services such as those of the National Library of Medicine are of great concern to me since I have spent almost 20 years in small- and medium-sized libraries. Indeed, a major reason for my coming to NLM was to help ensure that MEDLARS would serve the needs of this type of user.

There is a certain incompatibility in the requirements of small and large information systems. By its very nature, the large information system must address itself to a wide audience and must provide broad coverage; but to fill the needs of the small group, there must be provision for screening out what is not pertinent, what is of low quality, and what is redundant.

My viewpoint can be summarized by the simple statement: "The computer is here to stay." That which the

* Presented before the Division of Chemical Literature, Symposium on Problems of Small Information Groups, 151st National Meeting of the American Chemical Society, Pittsburgh, Pa., March 25, 1966.