

Current Comments®

Introducing *Sci-Mate*—A Menu-Driven Microcomputer Software Package for Online and Offline Information Retrieval. Part 2. The *Sci-Mate Universal Online Searcher*

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Two weeks ago, I told you about the enthusiastic response I received in 1978 when I proposed a microcomputer software system for arranging and searching your own reprint file.¹ I described how we were encouraged to develop and market that system, which we have named *Sci-Mate*™. Some of you by now will have seen advertisements announcing *Sci-Mate* in scientific and library journals.

Many *Current Contents*® (CC®) readers already have access to a microcomputer system. While some of these systems have excellent personal data base management facilities, they do not allow you to access online data bases. Managing one's personal data base is the function of the *Sci-Mate Personal Data Manager*.¹ But that is only half of the system. *Sci-Mate* also enables you to search large data bases on your personal computer. And as with the "offline" half of *Sci-Mate*, the *Sci-Mate Universal Online Searcher* is "menu-driven." That means you do not need to know a special command language to use it. Figure 1 summarizes the features and benefits of the online half of *Sci-Mate*.

The advantages of the *Sci-Mate* system become obvious when you consider the problem of searching online data bases. To search a large commercial data base, one has to know numerous procedures or protocols for dialing up the various time-sharing networks. First, one must dial up Tymnet, Telenet, or

some other network. Then each vendor has its own dial-up number. And the protocols for logging on to the particular vendor data base can be puzzling. For logging on to the ISI® Search Network, DIALOG, or BRS, for example, you need to remember three different multi-character codes. To recognize a "prompt" (a symbol or instruction), you need to know different symbols. You also need to know separate codes for limiting your search by document type or language. And there are also different ways to ask for your search term to be "truncated." (Truncation means that you want to use prefixes or suffixes as a generic search term or word root, as, for example, all words beginning with *fluoro*.) Figure 2 summarizes the procedures for each data base.

Sci-Mate has eliminated the need to know these often frustrating procedures. It dials up and logs on automatically. Then it automatically translates your instructions into the language of the particular data base you are searching. *Sci-Mate* can automatically access five different search systems: the ISI Search Network, DIALOG, BRS, MEDLINE, and SDC's ORBIT. Others will be added later. Once you are in these systems *Sci-Mate* gives you access to *ISI/BIOMED*®, *ISI/CompuMath*®, and *ISI/GeoSciTech*™ on the ISI Search Network; to *SCISEARCH*® on DIALOG; and to *Social SCISEARCH*® on DIALOG and BRS. *Sci-Mate* also pro-

Features	Benefits
Universal command language	You can search DIALOG, BRS, MEDLINE, SDC's ORBIT, and ISI® data bases with the menu-driven language, or the original search language of the host system.
Automatic dial-up and log-on	For all host systems, <i>Sci-Mate</i> will log on for you. With an autodial modem, it will also dial up.
Menu-driven search system offers most search capabilities of original search language of host	<i>Sci-Mate</i> simplifies the search, but retains the major functions offered by the host system.
Easy transfer of data to <i>Sci-Mate Personal Data Manager</i>	Transfer of records to the <i>Sci-Mate</i> data manager. "Hits" can be edited and stored.
Online updates	You can save successful search strategies for later use.

Figure 1: Features and benefits of the *Sci-Mate*™ *Universal Online Searcher*.

<u>FUNCTION</u>	<u>ISI® SEARCH NETWORK</u>	<u>DIALOG</u>	<u>BRS</u>
LOGGING IN			
Telenet	@ C 202 20 @ C 202 109 @ Log nnnn.nnnn ISI	@ C 415 20 @ C 415 28 @ C 213 170	@ C 315 20
Tymnet please log in:	ISINET;ISI	DIALOG	BRS
FILES			
Selection	DATA BASE?	Bnnn	ENTER DATA BASE NAME:XXXX
PROMPTS	*	?	__:
TRUNCATING	CELL#		
Unlimited characters	#CELL	CELL?	CELL\$
Limited to one or no characters	CELL:	CELL? ?	CELL\$1
Internal	WOM#N	WOM?N	WOM\$N
LIMITING			
By document type	DT=ARTICLE	LIMITn/ART	..LIMIT/n PT=J
By language	LA=ENGL#	LIMITn/ENG	..LIMIT/n LG=en

Figure 2: Comparison of different commands offered by different vendors, which must be used without a "menu-driven" system. The "limit" commands shown do not apply to all data bases.

Do you want to:

1. Enter the UNIVERSAL ONLINE SEARCHER
2. Enter the PERSONAL DATA MANAGER
3. Enter or change date
4. Delete the WORK file
5. Receive instructions on the use of SCI-MATE
6. Leave the SCI-MATE system

Select a number or enter ? for help:

Figure 3: What you see upon entering *Sci-Mate*™.

vides you with access to MEDLINE, to the other NLM data bases, and to other DIALOG, BRS, and ORBIT data bases.

As with the offline component, the *Sci-Mate Universal Online Searcher* allows you to search using plain English. The system gives you a list of choices at each step. Upon beginning the *Sci-Mate* program, you see the information shown in Figure 3. To search online, you enter "1". The resulting screen appears in Figure 4.

You now have a list of three basic search methods. Choice 1 allows you to search ISI data bases. *Sci-Mate* will prompt you with all of the details, including the names of each field (or information element, such as author, title, journal, etc.). Choice 2 allows you to search four hosts: DIALOG, NLM, BRS, and ORBIT. All are menu-driven, except that full details about each field of each data base are not prompted. Choices 1 and 2 will also give you the option of using either the "menu-driven" or the "native language" mode.

Choice 3—"Enter the passive terminal mode"—turns your microcomputer into an ordinary terminal. With this, you can use your microcomputer to search data bases not included as part of *Sci-Mate*. However, for these you must know the native language. I should stress that with all three choices, data retrieved with the *Universal Online Searcher* can be captured in the *Personal Data Manager*.

Suppose that you wanted, for the time being, to search just ISI data bases. When you press "1", you get the list of ISI data bases shown in Figure 5. To search *ISI/CompuMath*, simply press "2".

Figure 6 shows the menu for selecting your search mode. Figure 7 lists the choices for the menu-driven mode.

If you want to begin your search immediately, press "2". Figure 8 shows your "field" search options. You select a field and enter your search term. Having selected the title word search option, you are asked to enter your search term. In this case, the word chosen is "matrix." When you hit the carriage return key, *Sci-Mate* tells you how many hits it has found (see Figure 9). In this case, there are 2,017 papers with the word "matrix" in the title. On the screen are now four options. You can browse or expand the dictionary of terms. Or you can immediately begin to display and/or offload hits.

Figure 10 shows the screen you get when you ask to display. "Set to be displayed" gives the number of the sets

Do you want to:

- | | |
|---|----------------------------|
| 1. Search an ISI data base: | SCISEARCH 1981-DATE |
| ISI/BIOMED | SCISEARCH 1978-1980 |
| ISI/COMPUMATH | SCISEARCH 1974-1977 |
| ISI/GEOSCITECH | SOCIAL SCISEARCH 1972-DATE |
| 2. Search any data base on selected hosts | |
| DIALOG NLM BRS ORBIT | |
| 3. Enter the passive terminal mode | |
| 4. Leave the online search mode | |
| 5. Receive instructions in the basics of online searching | |

Select a number:

Figure 4: *Sci-Mate*™'s online data base "menu."

Available ISI data bases are:

1. ISI/BIOMED
2. ISI/COMPUMATH
3. ISI/GEOSCITECH
4. SCISEARCH 1981-DATE
5. SCISEARCH 1978-1980
6. SCISEARCH 1974-1977
7. SOCIAL SCISEARCH 1972-DATE
8. Return to the online menu

Select a number:

Figure 5: *Sci-Mate*™ menu for ISI® data bases.

You are connected to the ISI/COMPUMATH data base.

Search modes available are:

1. SCI-MATE search mode (menu-driven)
2. Native search mode (ISI command language)
3. Leave the ISI/COMPUMATH data base (return to online menu)

Select a number:

Figure 6: *Sci-Mate*™ screen for *ISI/CompuMath*®.

Do you want to:

1. BROWSE the search term index
2. SEARCH and retrieve
3. DISPLAY and/or offload
4. LIST current sets and queries
5. Use the SAVE STRATEGY subsystem
6. Set current awareness (SDI) parameters
7. Return to the online menu

Select a number:

Figure 7: *Sci-Mate*™ screen after you select the menu-driven search mode.

you have created. This is assigned to your search term, "matrix." "Print format" gives you a choice of six different ways to print the hits. "Offload record option" is used to store hits in your personal file. In Figure 10 we have chosen not to store hits. Otherwise, you would simply key "3" and be presented with the screen in Figure 11. Then you could decide whether to save some, all, or no records. Referring back to Figure 10,

however, if you simply want to begin displaying records you press the carriage return key. Figure 12 shows how *Sci-Mate* displays a hit.

While the number of hits on "matrix" is quite large, you might in other cases want to expand your search. This is called the browse option. It was the first choice in Figure 7. Figure 13 shows the browse menu.

Figure 14 shows the results of a browse of "matrix." The browse option shows you how many hits have been found for each word. This alphabetic display of terms will give you an idea of which additional or alternative terms you may want to use.

Sci-Mate gives you other ways to either broaden or refine your search. When you enter your search term, you can insert the symbol "#" at the end of a term. This is called the "wild card" and will automatically identify all terms containing the root preceding this symbol.

You can also refine your search by using Boolean logic, which means combining terms on the basis of *and*, *or*, and *not*. The screen for this operation is shown in Figure 15. You can use Boolean logic to include or exclude related terms. For example, you might want papers using "matrix" and "inversion," "matrix" or "array," or "matrix" but *not* "orthogonal."

Other types of Boolean searches can be done. Suppose you know that A.I. Ognev has published a paper in *Mathematical Notes*. But you don't have the title or the exact reference. *Sci-Mate* can help you find it. If you are just beginning a search, you will reach Figure 8 in the way I have just described. Or if you have been working with *Sci-Mate* for some time, you can return to the full menu by keying "F". At any rate, when you do reach Figure 8, you select choice 3, the author field. *Sci-Mate* then asks you to enter the author's last name. After you do that, it asks you to enter the author's initials.

What do you want to SEARCH?

- | | |
|---------------------------------|-----------------------------|
| 1. Set number | 7. Language |
| 2. Title | 8. Document type |
| 3. Author | 9. Research front specialty |
| 4. Cited author/cited reference | 10. Publication year |
| 5. Corporate source | 11. Accession number |
| 6. Journal | 12. OATS number |

Select a letter or number: **2**

Enter title term: **matrix**

Figure 8: *Sci-Mate*™ screen for search option. (User's responses in boldface.)

QUERY: TI=matrix
SET: 2017 HITS

Select a letter:

Figure 9: *Sci-Mate*™ tells you how many hits are found.

<p>Last Set Created: QUERY: TI=matrix</p> <p>Options in effect: SET TO BE DISPLAYED is 1 PRINT FORMAT is 1 OFFLOAD RECORD OPTION is off</p> <p>Choose one of the following actions:</p> <ol style="list-style-type: none"> 1. Change SET TO BE DISPLAYED 2. Change PRINT FORMAT 3. Change OFFLOAD RECORD OPTION <p>[CR] Start display of records</p> <p>Select a number or [CR]:</p> <p>Figure 10: <i>Sci-Mate</i>™ screen display command.</p>	<p>and which logic you are using. At the same time it will give you the choice to: 1) submit the query as is, or 2) continue with <i>and</i> logic.</p> <p>As with the "matrix" search described above, you'll get screens that tell you how many hits you've found, and you'll be prompted to choose a display or offload mode. Since you have only two terms to combine in this example, you'd</p>
<p>You are then presented with the screen shown in Figure 15. You can press "2" for the <i>and</i> option. Next you'll be shown the screen in Figure 16, where you will be prompted to select a field number. When you enter "6", <i>Sci-Mate</i> will prompt you to enter the journal title. You type in <i>Mathematical Notes</i>.</p> <p><i>Sci-Mate</i> will then flash you a reminder of which terms you are combining,</p>	<p>Last Set Created: QUERY: TI=matrix</p> <p>Options in effect: SET TO BE DISPLAYED is 1 PRINT FORMAT is 1 OFFLOAD RECORD OPTION is off</p> <p>Do you want to:</p> <ol style="list-style-type: none"> 1. Offload selective records 2. Offload all records 3. Offload no records 4. Delete work file <p>Select a number:</p> <p>Figure 11: The screen where you decide whether or not to store your hits.</p>

AN CM0216110 [ACCESSION NUMBER]
 TI 2-BODY OPERATOR MATRIX-ELEMENTS
 FOR PURE AND MIXED ORBITAL CON-
 FIGURATIONS IN THE UNITARY-GROUP
 APPROACH
 LA ENGLISH
 DT ARTICLE [DOCUMENT TYPE]
 AU KENT RD & SCHLESIN N
 CS UNIV WINDSOR, DEPT PHYS, WINDSOR
 N98 3P4, ONTARIO, CANADA
 SO INT J QUANT 22(2):223-239
 YR 82
 RF 21 [REFERENCES]
 ON NZ712 [OATS order number]

SAVE THIS RECORD? YES: [CR]
 NO: N[CR]

Figure 12: *Sci-Mate*™ display of record. Note "save" option at the bottom of the screen.

Which field do you want to BROWSE?

1. Title
2. Author
3. Cited author/cited reference
4. Corporate source
5. Journal
6. Research front specialty

Select a number: 1

Enter title term: **matrix**

Figure 13: *Sci-Mate*™ browse menu. (User's responses in boldface.)

BROWSE QUERY: TI=matrix

TERM #	HITS	TERM
1	2017+	MATRIX
2	1	MATRIXES
3	1	MATRIXSEMIGROUPS
4	45	MATROID
5	4	MATROIDAL
6	81	MATROIDS
7	1	MATROSOV
8	1	MATSAEV
9	1+	MATSUMOTO
10	1	MATSYN

1. Group terms in one set
2. Select terms for separate sets
3. Page forward
4. End current BROWSE

Select a number:

Figure 14: Screen displayed when you "browse" with a term.

ask for a display and see the hit in Figure 17.

Figure 15 also shows a "proximity operator" for refining your search. This means you can specify how close together the terms should be in the title. The proximity operator can be used to narrow a search. For example, if you used the *and* operator for the title terms "computer" and "design," you would get titles using both those terms in any order. The terms might also be separated far from each other and unrelated in the context of many titles. But if you used the proximity operator you could specify that "computer" appear first, and then from within one to six words of the term "design." A search of "computer" and "design" on *ISI/CompuMath* yields about 300 hits, but a search of "computer" and "design" with a proximity of two turns up only 100. You might use such a proximity to narrow your search to terms like "computer aided design" or "computer interface design."

Of course, *Sci-Mate* also makes it possible to do citation searching, that is, search by cited reference. At the bottom of Figure 18 you see what happens when you pick choice 4, the cited-reference field. *Sci-Mate* automatically asks you, one line at a time, to type in the author's last name, his or her initials, and the year of publication, volume number, and page number. Figure 19 shows that 21 papers have cited this reference.

Sci-Mate allows you to save search strategies that you plan to use again. Figure 20 shows the screen that allows you to do this. You reach it by following

QUERY: TI=matrix

Do you want to:

1. Submit query
2. Refine query with AND logic
3. Extend query with OR logic
4. Limit query with NOT logic
5. Specify proximity to another title term

Select a number:

Figure 15: *Sci-Mate*™ Boolean search menu.

What do you want to SEARCH?

- | | |
|---------------------------------|-----------------------------|
| 1. Set number | 7. Language |
| 2. Title | 8. Document type |
| 3. Author | 9. Research front specialty |
| 4. Cited author/cited reference | 10. Publication year |
| 5. Corporate source | 11. Accession number |
| 6. Journal | 12. OATS number |

Select a number: **6**

[Below: *Sci-Mate* asks for the journal title, which the user enters. *Sci-Mate* then displays the "query" reminder and lists the next options.]

Enter journal title: **mathematical notes**
QUERY: AU="ognev ai#" AND SO="mathematical notes"

Do you want to:

1. Submit query
2. Continue with AND logic

Select a number:

Figure 16: *Sci-Mate*™ combination search. (User's responses in **boldface**.)

```
1
AN CM0216874
TI METRIC PROPERTIES OF A CERTAIN
  CLASS OF MAPPINGS OF A SEGMENT
LA ENGLISH
DT ARTICLE
AU OGNEV AI
CS MV LOMONOSOV STATE UNIV,
  MOSCOW 117234, USSR
SO MATHEMATICAL NOTES 30(5-6):859-866
YR 81
RF 8
ON NZ672
SP 80-0815
```

Figure 17: *Sci-Mate*™ hit combining author (Ognev AI) and journal (*Mathematical Notes*).

the online menu to Figure 7 and entering choice 5—"Use the save strategy subsystem". When you press choice 1 in Figure 20, "Save current strategy", you have the option of saving all or only part of the strategy you just used. The other choices on this screen allow you to review, use, or delete strategies you've already saved.

Sci-Mate also has the capability for selective dissemination of information (SDI). You can go back to a data base you've already searched and limit your new search to the part of the data base that has been added since you did your last search. You can use this capability routinely to get all new material from data bases you've already searched. To

put it differently, you could use this SDI option to conduct the same search week after week without repeating all the detailed commands. This would be comparable to an *ASCA*® search.²

The screen you would use for this is shown in Figure 21. You get there from Figure 7 by keying choice 6—"Set current awareness (SDI) parameters". You can tailor your search time from the time it was last run up to the present, or to the cutoff date you choose.

The preceding examples demonstrate *Sci-Mate*'s capabilities on one ISI data base. However, I must stress that *Sci-Mate* is a *universal* searcher. As Figure 4, choice 2, shows, you can also search DIALOG, NLM, BRS, or ORBIT.

Figure 22 shows the non-ISI data base menu. If you want to search MEDLINE on NLM, you press "2". Once NLM appears, you would type in MEDLINE.

Figure 23 indicates your next option: whether to use the menu-driven or native language search mode. For a menu-driven search, you press choice 1.

Figure 24 shows that you get the identical list of choices you get in searching ISI data bases.

In fact, from here on, a non-ISI search is very much like an ISI search. The dif-

What do you want to SEARCH?

- | | |
|---------------------------------|-----------------------------|
| 1. Set number | 7. Language |
| 2. Title | 8. Document type |
| 3. Author | 9. Research front specialty |
| 4. Cited author/cited reference | 10. Publication year |
| 5. Corporate source | 11. Accession number |
| 6. Journal | 12. OATS number |

Select a number: 4

[The following lines on the left appear after you select "4". As you enter the information requested, it appears on the right.]

Cited author last name:	chirikov
Cited author initials:	bv
Year of publication:	1979
Volume of cited journal:	52
Page of cited article:	265

Figure 18: *Sci-Mate*™ cited-reference search. (User's responses in boldface.)

DISPLAY B=Browse S=Search L=List F=Full menu

QUERY: CR="chirikov-bv-1979-V52-P265#"
SET 5: 21 HITS

Select a letter:

Figure 19: *Sci-Mate*™ display for cited-reference search.

Do you want to:

1. Save current strategy
2. List names of saved strategies
3. Display a saved strategy
4. Submit a saved strategy
5. Delete a saved strategy

Select a number:

Figure 20: *Sci-Mate*™ save search strategy.

ference, shown in Figure 25, is the screen which appears when you choose the search option. The only searchable fields spelled out are set number (created for each search term entered), subject term or phrase, and author. (For NLM, the subject term or phrase field is called MeSH, or Medical Subject Headings. MeSH is NLM's vocabulary of descriptors and qualifiers used to index and catalog material for *Index Medicus*, MEDLINE, and other NLM services.)

Fields such as corporate source, language, and journal are not explicitly offered as they are in the ISI search menu. However, these fields can be searched if you know the vendor's code for them. You can find them in the vendor manuals. For example, the "tag" in MEDLINE for searching the language field is a three-letter code plus (LA). For English you'd enter ENG(LA).

In subsequent versions of *Sci-Mate*, the complete menu of searchable fields

Do you want to:

1. Review date of last ISI update
2. Restrict search to last ISI update
3. Restrict searching to a date
4. Remove the date restriction

Select a number:

Figure 21: SDI menu.

Systems available for searching are:

1. DIALOG
2. NLM
3. BRS
4. ORBIT
5. Return to the online menu

Select a number: 2

DATA BASE SELECTION

Enter the data base name: **medline**

Figure 22: *Sci-Mate*™ menu for non-ISI® data bases (top). The user has asked for NLM and has typed in MEDLINE (bottom). (User's responses in **boldface**.)

You are connected to the MEDLINE data base.

Search modes available are:

1. SCI-MATE search mode (menu-driven)
2. Native search mode
3. Leave the NLM data base (return to the online menu)

Select a number:

Figure 23: *Sci-Mate*™ response after you select MEDLINE.

Do you want to:

1. BROWSE the search term index
2. SEARCH and retrieve
3. DISPLAY and/or offload
4. LIST current sets and queries
5. Use the SAVE STRATEGY subsystem
6. Set current awareness (SDI) parameters
7. Return to the online menu

Select a number:

Figure 24: *Sci-Mate*™ menu for non-ISI® data bases.

What do you want to SEARCH?

1. Set number
2. Subject term or phrase
3. Author
4. Specific field

Select a number:

Figure 25: *Sci-Mate*™'s instructions for a non-ISI® data base. For option 4, you must look up the code in the NLM manual for fields such as journal, corporate source, etc.

for many non-ISI data bases will be shown *on screen*. This will eliminate the need to look at vendor manuals.

Figure 26 shows how you can enter a subject (or, on NLM, MeSH) term into MEDLINE. Here the term is "theophylline." Your next step is a screen that shows how many hits are found. It is much the same as the screen in Figure 9. There are over 1,800 hits for theophylline. You can modify the search with the *and* operator. Here I've added "asthma#" and "pregnancy". The result is nine hits. Figure 27 shows one of them.

As with ISI data bases you can display, browse, truncate, use the proximity operator, and save strategies. As with a search on ISI data bases, if you have the *Sci-Mate Personal Data Manager*, you can store the hits you have found online. Then you can search and sort that data in the ways I described in Part 1 of this essay.¹ You can "flag" hits according to whether or not you wrote for a reprint, ordered a copy from OATS® (Original Article Text Service), sent for an interlibrary loan, etc. You can periodically review the status of your reprint requests. You can generate printed reports on the information contained in your data base. When your reprints arrive, you can file them by accession number and search and sort them. All of these capabilities are also menu-driven.¹

I've explained in this two-part essay how *Sci-Mate* can store and search. But the system has another important use. *Sci-Mate* can help you prepare manuscripts for publication. Now when you prepare your bibliography you will be able to call up each relevant reference you need to cite. The full bibliographic details will be stored in your own personal work file. This information can be transferred to the floppy disk you will use in preparing the final manuscript. And if you need to add a few references that are not in your own file, then you can dial up the online system to retrieve what is missing. I don't think I need to

What do you want to SEARCH?

1. Set number
2. Subject term or phrase
3. Author
4. Specific field

Select a number: 2

Enter subject term or phrase: **theophylline**

Figure 26: How you enter a subject (or MeSH) term into MEDLINE using *Sci-Mate*[™]. (User's responses in **boldface**.)

```
5
AU - Labovitz E
AU - Spector S
TI - Placental theophylline transfer in
    pregnant asthmatics.
SO - JAMA 1982 Feb 12;247(6):786-8
```

Figure 27: A hit from MEDLINE, from a search based on the terms "theophylline," "asthma#," and "pregnancy."

indicate how this can improve the accuracy of references. Eventually, most microcomputer users will use one of the more common word processing systems to simplify the process of manuscript preparation even more. But for the time being, *Sci-Mate* will help you solve your personal problems of bibliographic control.

ISI has invested heavily in *Sci-Mate* not merely because it would like to turn a profit on its software. The success of *Sci-Mate* will help determine the success of, and generate use of, ISI's own data bases, not the least of which is *CC*.

We are constantly asked why *CC* is not online. Readers would like to read *CC* in their usual fashion and then simply key in the *CC* "oval" number on each journal issue and the article page number to obtain the full bibliographic record for that item. The fact is that you could obtain this information right now by using the ISI Search Network or *SCISEARCH*. However, the hitch is in the timing. Putting data bases online entails a certain

delay. Normally, *CC* information does not appear online for about one month after the appearance of *CC*.

However, in the near future ISI will announce a new online version of *CC*. This file will be updated almost *daily* directly from our data-entry facilities in Philadelphia and New Jersey. When you receive your copy of *CC* each week you will know that the electronic version of that information will be available immediately and held for as long as requested. There will be a reasonable fee for "down-loading" records to your own personal records file.

By using *CC* oval or *OATS* numbers you will be able to keep communication costs to a minimum level per transaction. Furthermore, we have already taken steps to change the charge method so that readers are not penalized for "thinking" time and other factors which do not use computer resources directly.

Sci-Mate and *CC* online can have a dramatic effect on the way you work. They can reduce the clerical work involved in ordering reprints and speed up worldwide communication in science. For those scientists working in the Third World or elsewhere, air-mail delivery of *CC* will become even more essential so we plan to include such delivery as a normal part of all subscriptions in the future.

The capabilities of the two basic software components I have attempted to describe to you in this two-part essay are extensive. We could not assume that every reader understands the concept of the personal data base management system. We could not assume that the concept of searching online bibliographic data bases is understood by all. We have attempted to show how these two functions are intimately interrelated and why we decided to put them together in an integrated package. However, if you are not yet ready for online access then you can simply use the offline system until you are.

Sci-Mate software is currently available for the IBM Personal Computer, Vector 3 or 4, the Apple II, the TRS-80 Model II, and any CP/M-80 (control program for microprocessors) system with a standard eight-inch disk. This includes dozens of brands like Altos, Industrial Microsystems 8000, and Hewlett-Packard 125. For the IBM, a CP/M-86 operating system is required. For the Apple II, you need cards (circuit boards) for a Z80 microprocessor, 16K RAM (kilobytes of random access memory), and an 80-column screen. In addition, to use the *Sci-Mate Universal Online Searcher*, you need a modem, a device you connect to your telephone so you can dial up the hosts for the various online data bases. *Sci-Mate's* automatic log-on will work with any modem. However, an automatic modem is needed to take advantage of *Sci-Mate's* automatic dial-up.

The *Sci-Mate Universal Online Searcher* can operate with 64K RAM. However, if you have more RAM you can store more complex search strategies. We also recommend a minimum of 500K of disk storage for effective operation. But remember you will want more

to store large files on the *Sci-Mate Personal Data Manager*. *Sci-Mate* works best with at least two disk devices. However, it's preferable that one of your disks be a hard one, to store your records. Hard disks store much more information than floppies.

The offline *Sci-Mate Personal Data Manager* costs \$540. The online *Sci-Mate Universal Online Searcher* option is \$440. Together, both cost \$880—a savings of \$100. For more information on *Sci-Mate*, write to Joel Sartorius, ISI, 3501 Market Street, University City Science Center, Philadelphia, Pennsylvania 19104, USA, or call (800) 523-4092. Telex: 84-5305. In U.K. contact A.E. Cawkell at CITECH Ltd., P.O. Box 5, Ickenham, Uxbridge, Middlesex UB10 8AF, England. All others should write to ISI's US headquarters.

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