TOWARDS A UNIFORM FEDERAL REPORT NUMBERING SYSTEM AND A ~~GUDDLY~~ MICROFICHE READER--TWO MODEST PROPOSALS

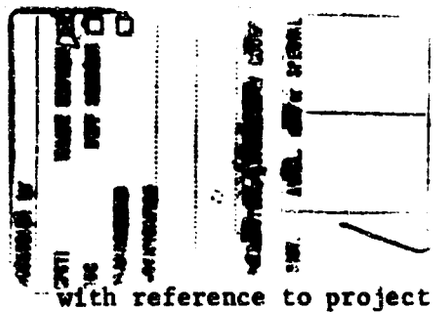
(Address by Dr. Harold Wooster, Director of Information Sciences, Air Force Office of Scientific Research, Arlington, Virginia 22209 before Third Annual Northeastern DDC/Industry Users Conference Waltham, Massachusetts, 17 April 1968.)

(Revised 7 May 1968)

A recent Conference on Bibliographical Control of Government Scientific and Technical Reports reached the following conclusions:

"The scientific and technical reports issued by thousands of organizations engaged in (decentralized) research have presented a problem of bibliographical control which has not yet been solved in spite of costly and laborious attempts made by different agencies... The established abstracting and indexing services are ineffective because...they are not geared to the mounting tempo of government sponsored research...Various agencies and offices find it impossible to wait until the problem is solved or its various phases are isolated and understood. And so, different palliatives are tried, most of which are ineffectual and can be expected to break down under the sheer quantity and heterogeneity of the reports...

"Thousands of reports are coming in and every decision to file and record them proves ineffective because no factor or indicia common to all the reports can be found. Some reports give the authors but no titles, and others give titles but no authors; some have division numbers but no contract numbers, and others have contract numbers but no division numbers. The situation is true, mutatis mutandis



with reference to project numbers, report numbers, panel numbers, memorandum numbers and what not....

"What is required is the promulgation by some organization having the requisite authority of a scheme through which every scientific and technical report prepared and issued under a research contract (or grant) with any Federal agency would bear a symbol which would uniquely identify each report and relate it systematically to all other reports....In order to avoid confusion between this required symbol and any other symbol or symbols which contractors or agencies wished to use for their own internal administrative purposes, the requirement for the use of the symbol called for by the overall scheme would specify the position on the title page or cover in which it would appear."

Time does not permit discussing the other findings of this distinguished group--the requirement that all reports prepared with Federal funds be accompanied with an abstract; the need for a uniform Federal code for cataloging scientific reports; the creation of a Board on New Terminology for Research in Progress, which would function in a manner comparable to the Board on Geographic Names--all new terms, code names, names of devices would be registered with the Board with their definitions and necessary explanations--the Board to issue glossaries of such new terms which would be accepted as definitive by Federal agencies; and, a set of standard Federal specifications for preparing bibliographies.

Time does permit citing the broad requirements for information service: "Units of information, no matter how recorded or distributed, are collected into a huge mass. The humble seeker after information finds this mass, created to facilitate the location of the information, is nearly as much a barrier to reaching this material as it is an aid.

"Techniques must be employed to provide the seeker with a record small enough that it can be used effectively yet with the assurance that no pertinent record has been overlooked.

"Furthermore, the record must be one which the user can use wherever it suits his convenience, and finally, the service must be completed by rapid delivery of the material he selects."

I am sure that all of you must be wondering by now how you could possibly have missed hearing of a conference with such progressive insights into the heart of today's information problems--that this might be perhaps a COSATI report buried somewhere in your in-basket. I must confess that I cheated slightly when I said the conference was held recently--it was in fact held at the Library of Congress on September 27-29, 1947, and reported in Special Libraries for May-June 1948 (pp 154-160) by the then Chief of the Science and Technology Project, The Library of Congress, one Mortimer Taube!

Can we honestly say that today, more than two decades later, a single one of these problems have been solved--despite the valiant efforts of the Committee on Scientific and Technical Information,

which now has more Panels, task forces and working groups than the average information center has staff, and the equally valiant efforts of the Armed Services Technical Information Agency and the Office of Technical Services to cast off the demons which have been pursuing them by assuming aliases which I wish I could remember. I think not.

I assume that if these problems could be solved by committees they would have been solved long ago. Perhaps it is time for individual invention. And so I propose simple--minded solutions to two of the problems which Mort Taube stated so clearly 20 years ago:

I The need for a uniform report numbering system.

II The need for a record which the user can use wherever it suits his convenience, and completed by rapid delivery of the material he selects.

I Report numbering systems

Those of you whose only contact with reports has been as consumers may wonder what the fuss is all about--you order by AD or PB number from TAB or USGRDR and sure enough when the report arrives it has a single six-digit number--in the upper right-hand corner (perhaps with a hand-inked correction or two) if it is a PB report, and either neatly printed in the upper left-hand corner or more or less sprayed around at random from a badly inked

stamp pad (you'd think that with all that money for computers they could buy a bottle of stamp pad ink) if it is an AD report.

Now anyone who has actually shelved reports instead of massaging computer surrogates knows that there is only one proper place for a report number--in the upper left hand corner. And I'm afraid that if I suggested that DDC and CFSTI get together on report number location the usual government method of compromise would put the number in the middle! So let's be dictatorial and say that all report numbers belong in the upper left hand corner.

(This, of course, assumes that reports are shelved as books--long dimension vertical and spine out. The first time I discussed report number location in a public meeting I was set upon by four dissenting librarians. One of these charming ladies shelved reports horizontally, spine up, and wanted the number in the lower left-hand corner, but printed parallel to the spine. Another, as I remember, shelved reports spine in (although I forget why she did it) and wanted the numbers on the upper right of the front cover and on the upper left of the back cover. I believe that one of the other two shelved reports spine down, and wanted the numbers on the lower right hand corner of the cover and the lower left hand corner of the back, printed parallel with the spine, only with the bottom of the numbers towards the spine; whatever the fourth wanted was different from the other three. As General De Gaulle was quoted under similar

circumstances, "How can one expect to govern a nation with this many varieties of cheeses?" Under the circumstances perhaps one should print the same numbers in all four corners of the front and back!)

Now life would be very simple if the contractor could be told what the AD number or PB number of his report would be when he set the type for the cover. But for reasons I do not pretend to understand this beautifully simple system was abandoned some 10 years ago. So what happens? The contractor assigns his own control number and ships the report off to his sponsoring agency, which assigns a new, completely different number--then off the report goes to get an AD number, and possibly even a PB number, although I've been told that now it's one or the other, which has (or have) no key to the preceding numbers! Eeech!

In the present free enterprise system contractors usually devise a quasi-mnemonic acronym which is used as the first part of their own report number. I am indebted to the able and acerb Administrator of the Defense Documentation Center for a copy of an internal DDC publication dated 15 March 1968. This Source Header List is an alphabetical arrangement of all technical report source names used by DDC as of that date, together with the acronyms "for internal used" (sic) in DDC. A very rough count indicates that there are some 14,320 corporate authors listed. Some idea of the charming diversity, both

of acronyms and of corporate authors, may be gained from the following scrap of doggerel found on a memorandum headed "Office of the Poetaster" accidentally enclosed in the volume:

Twas BWLAI 1/ and the SLINY 2/ TWISC 3/
Did GAF 4/ and GERGO 5/ in the TURF 6/:
All MUCKU 7/ were the BU-W-GISK 8/
And the MUDE 9/ RRAFS 10/ OSURF 11/

References

1 Badger (W L) Associates Ann Arbor Mich

2 Sage Labs Inc N Y

3 Taylor-Wharton Iron and Steel Co Easton Pa

4 General Aniline and Film Corp New York

5 General Electric Co Santa Barbara Calif Radio Guidance Operation

6 Toledo Univ Research Found Ohio

7 Makerere Univ Coll Kampala (Uganda)

8 Bonn Univ (West Germany) Institut fuer Strahlen- und Kernphysik

9 Michigan Univ Ann Arbor Dept of Economics

10 Rydbeck Research Associates Fjaras (Sweden)

11 Ohio State Univ Research Foundation Columbus

I propose that this anarchy be replaced by a formalized CODEN system for both corporate authors and sponsoring agencies. The CODEN system is now widely used for names of scientific journals. For those

of you who are not familiar with it, CODEN are a series of 6 letter abbreviations (5 letters plus 1 for parity control) for journal names, standardized and controlled by a central agency, which periodically issues an authority list of CODEN and does (or should) provide reference service between, both in providing CODEN for new journal names and in identifying puzzle CODEN which can't be found in the printed lists.

The 14,320 corporate authors now listed by DDC would be taken care of very nicely by 26^3 or 17,576 3 letter CODEN. Using 5 letter CODEN would give 11,881,376 possibilities, which should allow some room for expansion.

So, what would be so difficult in maintaining a central registry of CODEN for corporate authors and sponsoring agencies, and in using these as the first parts of a standard report number?

A report done by the MIT Radiation Laboratory for the Air Force Office of Scientific Research would then have as the first part of its number MITRL/AFOSR.....

(And in the rare instances when contractor and sponsor are identical, as is the case with this report, one simply repeats the CODEN. Thus, this report would be numbered "AFOSR/AFOSR",)

The second part, obviously, would be two digits for the calendar year, say MITRL/AFOSR-68...

So far, a fairly pedestrian solution--the only thing new is the

suggestion that a central registry for these abbreviations be maintained, and that they be standardized at 6 letters.

The next step, however, is sheer genius, a term I normally use with great restraint. We have to have numbers, and we must recognize that a sponsoring agency would never dream of using a contractor's number--it must issue one of its own. So, I propose that each contractor begin each new year of numbering his reports from a COSATI table of prime numbers--COSATI should be able to get inter-agency coordination on the table, at least--starting with two digit primes--11, 13, 17, 19, 23 and so on, so his first report of the year becomes:

MITRL/AFOSR-68-11

Now the report hits the monitoring agency--and one digit primes are reserved exclusively for the use of such agencies. Does the agency go to a numerical list of numbers and tick off the next number in order? Nothing that complicated. All it does is multiply the contractor's number by 2! And the agency number becomes:

MITRL/AFOSR-68-22

And this leaves 3 for DDC, 5 for the Clearinghouse and 7 for some as yet unimaginable capping agency. And to identify a document proudly numbered as MITRL/AFOSR-68-2310 you simply factor it by 7, 5, 3 and 2 to find out that it is our old friend, MITRL/AFOSR-68-11 after it has been logged in by 4 agencies in series.

II The need for a record which the user can use wherever it suits his convenience and completed by rapid delivery of the material he selects.

Taube's plea for a record meeting the above specifications could be said to be met by microfiche, which is the topic of one of today's panel discussions. Now microfiche might seem to be the answer to a maiden's prayer--until you start looking at it. And when you do, you discover that it has grown up in splendid ignorance of three inventions; which I list in chronological order:

1. The invention of boustrophedon writing by the early Greeks.

2. The invention of the bound book, say as exemplified by the Codex Sinaiticus and Codex Vaticanus of the Bible, both in the 4th century.

3. Thomas Alva Edison's invention of the Kinetoscope, first demonstrated in West Orange, New Jersey on 6 October 1889.

And I submit, and hope to prove, that if microfiche is to meet the dreams of its promulgators it must couple the lessons to be learned from these three inventions with the ingenuity of a reasonably good Japanese camera designer.

Mind you, I am not talking about the cameras to make microfiche, which are as far from the user as a precision photo-engraver's camera is from the reader of Life, but applying camera technology to the species of personal microfiche reader which the sort of user who can't be trusted with a checkbook and the back pages of Modern Photography or in a good camera store which will accept his credit card might

be tempted into buying.

One of the first problems you encounter in designing small microfiche readers is film transport--and this is where Tom Edison's great invention comes in. Microfiche is sheet film--no great problem to move around in a large, fixed camera, but sheer hell to move precisely a controlled (and countable) distance in a reader. Back in 188? when old Tom was inventing movies, he bought a 50 foot strip of George Eastman's new-fangled nitrocellulose based film for $2.50--and discovered that if he wanted to move it precisely through a movie camera he had to punch holes in it--and I was surprised to discover that the size and spacing of the sprocket holes in his first movie camera continue today.

Now you can buy sprockets and counters for standard 35 mm spacing by the bushel today, and they make a jim-dandy way for moving film around in precise, easily controllable increments. So, before the country starts getting flooded with microfiche, I think it might be worth talking about a new standard film stock--one with sprocket holes in standard 35 mm spacing along the top and bottom--and I'd even be willing to argue for it along the sides if I didn't run into trouble at the corners!

Now, back to the Greeks, and boustrophedon writing. Any one of you who has ever used the CI scale on a slide rule, or computed, say X^2 on a desk calculator knows what I'm talking about, even if

you didn't know what it's called--it's the old trick of minimizing motion of the slide or carriage. Just to be formal about it, "boustrophedon" is from the Greek bous, ox and strepho, turn, and means "as the ox plows" and is applied to early Greek inscriptions where the writing was alternately from right to left and from left to right.

In a standard microfiche, the frames are arranged so:

1	2	3	4	5	6	7
8	9	10	11	12	13	14

and so on, and when you go from frame 7 to frame 8 you not only have to drop down a line, but waste a full traverse of empty motion--plus picking up a few registration problems.

Wouldn't it be simpler to be as smart as the Greeks were 2,000 years ago and arrange the frames like this:

1	2	3	4	5	6	7
14	13	12	11	10	9	8
15	16	17	18	19	20	21

This should work even on today's poke-and-fiddle readers and would save a lot of waste motion. How about it?

And now let's come up to the unknown inventor of Bibliographic On-Line Organized Knowledge, usually known by its acronym, BOOK, and look at the specifications he met for a portable, self-contained packet of knowledge and try, just once, to translate them into today's

mechanical idiom and match them with those of a personal, portable microfiche reader:

Size. No greater than 8½ x 11 inches. This allows for full throw each way of a 4 x 5 inch microfiche and can still be held comfortably in two hands. Maximum thickness should be no more than 1½ inches, so it will fit comfortably into a stuffed attache case. I know that this makes problems for the lens designer, to get sufficient magnification in such a short throw, but in these days of plastic lenses and fiber optics, what's he getting paid for?

Case. Molded of high-impact plastic--Cyclolac or equivalent, with all edges and corners rounded. Should be warm and comfortable to hold--even cuddly!

Power Source. Self contained, nickel cadmium batteries. Alternate use on 110 volts; built in charger; can also be used direct on 12 volts, or charged from 12v outlets.

Page size. 5 x 7 inches. This is the size of a DDC report printed 2 pages on one and must be satisfactory or they wouldn't use it.

Controls. One full motion, after preliminary centering should move 1 full frame in either X or Y direction like the film transport lever on a good 35 mm camera. Mechanical X and Y counters give row and frame numbers.

Ambient light. Should be readable in any conditions from total darkness through a darkened airplane cabin to bright sunlight. (And if you think this latter condition impossible take a look at the black screens on the little Japanese portable televisions!)

Since I understand that one of the two standard design procedures is to build the package first and then figure out how to put the stuffing in it, I have designed and built a non-working model of a personal microfiche reader, as shown in the accompanying illustration.

If--and I'd be the first to admit it's a mighty big if--something like this personal, portable, cuddly microfiche reader can be built to retail at no more than $100--it should overcome the last major obstacle to the use of microfiche.

And I'll be able to close the lid on my attache case!

SUMMARY

It may be a major tactical blunder to introduce more than one new idea into an essay; if so, I have erred grievously in introducing five! But, for the record, let me enumerate them:

1. A standard Federal report numbering system, using CODEN for the corporate authors issuing reports and the agencies sponsoring them, these CODEN to be an integral and permanent part of the report number.
2. Prime numbering for reports.
3. A new physical format for the sheet film used in making microfiche,

ZD

incorporating sprocket holes in standard 35 mm film spacing along the long sides.

4. Boustrophedon arrangement of the images on the microfiche.

5. A novel design for a personal, portable, cuddly microfiche reader.


OFF

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)

Directorate of Information Sciences
Air Force Office of Scientific Research
Arlington, Virginia 22209

2a. REPORT SECURITY CLASSIFICATION: Unclassified

2b. GROUP:

3. REPORT TITLE

TOWARDS A UNIFORM FEDERAL REPORT NUMBERING SYSTEM AND A CUDDLY MICROFICHE READER--TWO MODEST PROPOSALS

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Scientific Interim

5. AUTHOR(S) (First name, middle initial, last name)

Harold Wooster

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
17 April 1968	15	1

8a. CONTRACT OR GRANT NO	In-house	9a. ORIGINATOR'S REPORT NUMBER(S)
b. PROJECT NO	9769	
c	6144501F	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d	681304	AFOSR-68-0772

10. DISTRIBUTION STATEMENT

1. This document has been approved for public release and sale; its distribution is unlimited

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
PROCEEDINGS Presented at Third Annual Northeastern Documentation Center/Industry sers Conference, Waltham, Mass., 17 April 1968	Air Force Office of Scientific Research(SRI) 1400 Wilson Boulevard Arlington, Virginia 22209

13. ABSTRACT

The author cites a 20 year old report on the bibliographic control of government reports and questions if any of the problems then posed have in fact been solved. He then proposes solutions to two of these, a uniform Federal report numbering system, and the design of a personal microfiche reader. His report numbering system suggests the use of CODEN for performing and sponsoring agencies; these CODEN to be integral and permanent part of the report number. He also proposed a system of prime numbering to identify specific reports--a solution almost too brilliant to be taken seriously. He then turns his facile attention to microfiche readers and shows how the design of readers has been hampered by two factors; the absence of a means for precisely moving the film in controlled increments, and the arrangement of images of the fiche. He proposes standard sprocket holes on the fiche and a boustrophedon arrangement of the images. The report culminates with the design of a microfiche reader which would be personal, portable, and cuddly.

DD FORM 1473

Unclassified

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Documentation						
Information storage and retrieval						
Report control numbers						
Microfiche readers						