

COMPUTER APPLICATIONS TO BOOK CATALOGS AND LIBRARY SYSTEMS

Donald H. Stromberg

Librarians must look to the future information needs of a country expanding in population, technology and educational requirements. The "information explosion" is placing an additional strain on existing methods of providing information rapidly and economically.

A library seeking to develop a modern information retrieval program has many existing services from which to choose. The problem is to define the program that will best serve the present library users and leave room for flexible action in the future, and then to pick a combination of services that best match these objectives.

Documentation Incorporated (Doc Inc) of Bethesda, Maryland, was founded in 1952 by the late Dr. Mortimer Taube, and has been engaged in developing modern information retrieval systems for government and industry. A key concept that is now emerging is the development of mechanized or computerized data banks. This data bank concept is a plan for organizing a single set of data for producing many products. The traditional library card catalog or data bank, long the key to finding materials in the nation's libraries, today is getting competition from book catalogs. Using data bank techniques to keep a library catalog updated, Doc Inc computer systems generate printouts of the catalog which are used to produce bound books for distribution to library users. In effect, the book catalogs are carrying the traditional card catalog, literally, into the homes and offices of users instead of requiring them to trek to the library to find out if the information they want is available. The computer is used to produce several indexes (such as subject, author, and title) in various formats from a single file of data and is particularly effective if the catalog data bank is standardized.

Despite the wide variety of ways libraries catalog books, most differences are variations of the Library of Congress cataloging system. By using the LC catalog system as a basis or standard for

Donald H. Stromberg is Director of the Publication System Division of Documentation Incorporated, Bethesda, Maryland.

building the data bank, most libraries can be provided with just the index information they need by selecting only those items that apply from the LC data bank. An LC data bank system can produce book catalogs for many libraries from the same data, with provisions for handling special information.

Having introduced the general concept of Documentation Incorporated, the following questions should be answered: (1) Why book catalogs? (2) Why use a computer to produce book catalogs? (3) Why develop a catalog data bank? Each of these questions is inter-related in terms of cost, standards, service, and advancements in technology.

(1) Why Book Catalogs?

There are advantages and disadvantages to both book catalogs and card catalogs. However, it is interesting to note that the card catalog for all practical purposes is a little more than seventy years old and was preceded by book catalogs. In a paper, "Book Catalogs Versus Card Catalogs," by Irwin H. Pizer, the present trend back to the book catalog made possible by recent advances in computer technology is analyzed and advantages and disadvantages are compared.¹ To quote a final statement, "We have gained most of the advantages, have minimized a few of the disadvantages, and, indeed, can look forward like Dr. Pangloss to a computer produced catalog which will be the best possible one, in this best of all possible worlds."

Book catalogs can cut costs by eliminating the purchase or production of cards for multiple locations, the expense of card file maintenance and card cases, and the freeing of prime space now occupied by bulky card catalog cases. They offer more service by providing complete holdings catalogs in bookmobiles; cataloging and order sections; local, school, branch, and cooperating libraries; reference desks; university schools, departments, and residences; and offices of researchers. They can save staff time by eliminating card catalog maintenance activities such as typing cards and headings, sorting, filing, reviewing, and replacing. Book catalogs are as easy to use as a telephone directory—users are generally more familiar with reference books than with card files. Page scanning allows faster location of entries with similar entries and headings, quickly compared at a glance.

Finally, with advancements in computer technology, the quality of the computer final product has been greatly improved. The first advancement was the introduction of both upper and lower case characters directly printable from the computer. The second is the development of photocomposition equipment which is capable of taking

computer generated tapes and composing, with graphic arts quality, the book catalog entries. The quality of the computer produced catalog, which in the past has concerned many librarians, has greatly improved.

(2) Why Use a Computer to Produce Book Catalogs?

Computers are high speed data processors, ideally suited for performing many repetitive clerical tasks, providing that the decisions required can be limited and explained. The scope of the required decisions and the volume of the data to be processed are key factors in deciding what data processing equipment is to be used. It is important to realize that there is a wide range of computers with varying limitations—not the least of which is the craftsman or computer specialist who puts this tool to work. Electronic Accounting Machines (EAM) card processors are quite limited and should not be confused with the memory stored-program computers that utilize tape and disc storage devices as well as punched cards. Card processors have inherent limitations when scanning, compressing, selecting, and sorting data which are required to meet the challenge of the filing rules and variations of catalog information.

Computers are used to produce book catalogs because they offer cost savings, flexibility, consistency, and selected retrieval. The converse of this statement is also true when the tool is applied improperly. An experienced computer specialist would not use this tool solely as a reproducing device. Similarly, a librarian would not send a catalog card to a printing firm to produce one copy. The professional should know his tools and when and how to use them. A computer pays off only when it produces the right information on demand, but what comes out depends not only on what is put in, but on how it is done.

(3) Why Develop A Catalog Data Bank?

The concept of developing a catalog data bank is a key factor in utilizing the computer to produce book catalogs. Cost savings and standardization of catalog information are the major benefits derived from this concept. The Council on Library Resources has granted \$130,000 to the Library of Congress for a pilot program of distributing library catalog data in machine readable form. Under this grant the Library of Congress will also study the value and feasibility of providing this service to libraries on a broad scale and a continuing

basis. Successful completion of this project can reduce even further the cost of computer generated book catalogs, if the primary content of the data bank is standardized to the LC cataloging.

In adopting a cataloging standard such as LC, a library can also experience a substantial reduction in individual cataloging requirements. This is not to say that cataloging will not be required in the future, but since many libraries utilize LC catalog cards in whole or in part, cataloging can be limited to those titles that have not been processed by the Library of Congress.

Professional librarians should have little fear of automation creating unemployment. To quote from the "National Inventory of Library Needs," by Edwin Castagna, concerning the professional staff, "The national shortage in professionally trained staff to meet ALA standards in these libraries would be around 100,000. The data on present staff are for 'professional positions filled' and not professionally trained librarians."² In reviewing the various reports included in the National Inventory of Library Needs, it is apparent from the deficiencies highlighted that there is good reason to limit original cataloging to those items not cataloged by LC if it does not greatly aid the use of the library collection.

Using a Computer to Produce Book Catalogs

This section explains the process used to produce a book catalog from Documentation Incorporated's computer equipment consisting of an IBM 1410 and 1401 tape system. Figure 1 illustrates the general systems flow for computer production of book catalogs. Figures 2-7 are actual samples derived from the Baltimore County Public Library book catalog project.

Each step in the general systems flow is described briefly as follows:

The Catalog Card. The catalog card, which is normally placed in the card drawer, is the primary source of input for computer processing. This is particularly true for those titles that have already been cataloged or are processed by a national organization such as the Library of Congress. When the individual library system performs the cataloging, a standard input form should be used for recording the pertinent data. The use of a standard form with pre-printed identification of each data element to be included in the computer file eliminates the need for additional machine coding and can be used in the ordering process.

To secure a book catalog, a library must provide an identification number for those titles contained in or added to its collection. The identifying number for titles cataloged by LC is the LC card

number and is used by the individual library to call the title from the data bank for the book catalog. Those titles not cataloged by LC require an identification number and processing using the standard input form.

Coding, Editing, and Proofing. The first function in the processing is that of coding and editing the catalog information for machine preparation and is only necessary for those titles not already included in the data bank master file. A typical BCPL entry that has been coded and edited is illustrated in Figure 2. The handwritten marks or "tags" identify each element of catalog information and are used throughout the computer system for selecting, formatting, and generating field descriptions. The standard input form, used by a library to catalog titles that are unique to its collection, should contain the tag identifiers.

Machine Preparation. The machine preparation function converts the written information into machine language. An 80-column Hollerith (IBM) card is the most popular form of computer input. In preparing the catalog entry for the computer system, each tagged item is key punched into a card. If the information for an item exceeds the card limit of 80 columns, a second or third follow-on card is prepared. A special code is punched to indicate that the following character is to be capitalized when required.

The conversion of written information into machine language may also be accomplished effectively using punched paper tape or optical scanning equipment. The state of the art of optical scanning still requires rigid control of the source document format and character style.

Computer Edit and Update. The computer edit and update phase of the processing system performs the file maintenance and is separate from the actual generation of the book catalog. Emphasis is placed on maintaining an accurate data bank file. The five basic steps of this phase follow:

- a. Read the punched cards and create a magnetic tape of the card information.
- b. Sort the magnetic tape into ascending order.
- c. Edit the information to determine if the tags and machine codes are properly encoded.
- d. Update the existing master magnetic tape file with the new information.
- e. Print the proof listing of all changes to the file in upper and lower case.

The IBM 1401 performs steps (a) and (e) and the IBM 1410 performs steps (b)-(d). A new magnetic tape file is created during the updating process and reflects the latest version of the data bank file. This tape is used as input for the next cycle.

A sample of the proof listing from step (e) is illustrated in Figure 3. Errors in coding and machine preparation are corrected on the proof listing, and the file maintenance cycle is repeated. The proof listing contains printed information that is not recorded on the original coded entry. This information is computer generated by identifying the tags and is used to facilitate proofing and proper filing. In comparing subject terms on the proof listing, tag 72001 does not contain the punctuation and capitalization that appear in tag 72002. This is a computer generated sort field and can be changed in the next update cycle if it does not conform to the required filing rules. Sort fields are generated for each major heading and are a very important feature of this system.

Computer Generated Catalogs. Once a corrected master file has been created, the generation of the book catalog becomes a mechanical process performed in the four steps that follow:

- a. Select from the master file the information required for each of the indexes.
- b. Sort the major headings for each index.
- c. Format for printing.
- d. Print the indexes.

It is the decision of the individual library system that determines what indexes are necessary and the contents of each index entry. Figures 4-7 are reproductions of the actual full page IBM 1401 printout for the subject, author, and title indexes requested by the Baltimore County Public Library. Variations of the original entry (see Figure 2) are illustrated in each of the indexes. Examination will also reveal the series statement as a major heading in the title index (see Figure 7).

It is important to reiterate the flexibility that is available in applying computer systems to producing book catalogs. For example, if a library decides that the next publication of the book catalog should not have series statements as a major heading in the title index, there is no need to change any of the entries that have been incorporated in the master file. This is automatically accomplished by instructions to the computer selection program.

Overview Print and Bind. The overview phase of this process is to insure the accuracy of the final product. It is not necessary to cut, paste, or strip the computer print-out prior to making a plate for the printing. In other words, the computer print-out is the camera ready copy. Printing and binding of the final product is the same process as for other types of publications.

LC Entries and Photocomposition. The concept employed to produce book catalogs for the Baltimore County Public Library applied to producing the sample LC entries in Figure 8. The contents of the printed entry in each of the indexes are subject to decisions of

the individual library system. It is, however, more economical to print the full entry in one index and abbreviated versions of the entry in the remaining indexes.

Photocomposition enhances the appearance and reduces the number of pages required in a book catalog. Figure 9 illustrates a sample photocomposed BCPL catalog page. Photocomposition devices, which can be driven from computer generated tapes, offer the flexibility of type styles and graphic arts quality available in typesetting. This process can be justified when the number of pages and copies is substantial, or the publication is semi-permanent such as an annual or biennial cumulative book catalog.

Looking Forward

There are many advantages to automating library systems such as simplifying the ordering and lending processes using computer techniques. Certainly computers can improve reference services by making it possible to provide demand bibliographies. However, most of us are looking to exciting future applications of computers to information processing. Wouldn't it be nice to push a few buttons on the touch-tone telephone that would bring a favorite novel beaming through your television set at home? Impractical? Today, the answer is yes, but look at the developments over the past several decades—television and video tapes, computers linked by telecommunications, touch-tone dialing systems, and last but not least, the catalog card in machine or computer form.

One major step forward is to have a convenient display of the contents of the library collections at the user's disposal and the library collection in a machine form ready to respond to inquiries. The key to matching the user's need for knowledge about the collection and the mechanics of the system is the published catalog. Advancements in technology will make this service economical on a wide basis, but there is a real need for libraries to prepare for the future; publications and educational programs will be required for the users in addition to a conversion of the physical form of the collection into a computerized data bank.

REFERENCES

1. Pizer, Irwin H. "Book Catalogs versus Card Catalogs," Bulletin of the Medical Library Association, 53:238, April 1965.
2. Castagna, Edwin. "National Inventory of Library Needs." In U. S. Office of Education. Library Services Branch, in cooperation with the American Library Association, National Inventory of Library Needs. Chicago, American Library Association, 1965, p. 2.

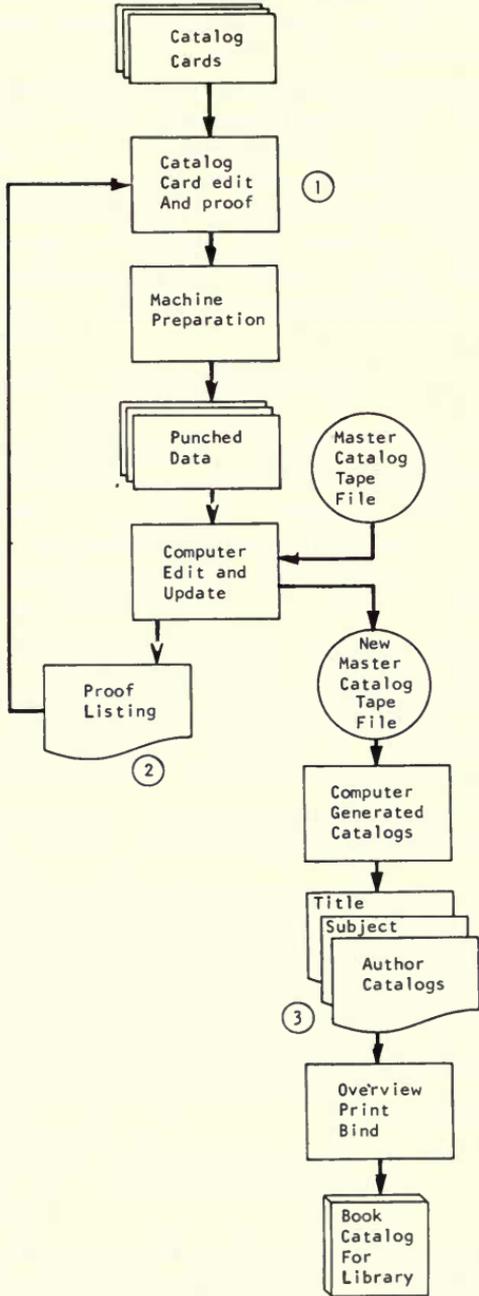


Figure 1
General Systems Flow for Computer Production of Book Catalogs

04162	940.542	2400B	66010238
04242		Cole, Hugh Marshall	-48002
		28002—Ardennes: Battle of the Bulge.	1965
		29002 (United States Army in World War II: the European theater of operations)	
		72002	
X	X	Ardennes, Battle of the, 1944-1945	X
		Series	

Figure 2
A Coded Catalog Card

ACCESSION # 66010238		TRANS	WORD	
FIELD	TAG	CODE	PREFIX	DATA
	COLS	COL	COLS	COLS
	9-13	16	17-22	23-80
Dewey Decimal Number	04162	00	00	* 0940.542 ₁
Author Initial	04242	00	00	* 0C ₁
Author	2400b	00	00	* 0Cole, ₁ Hugh ₂ Marshall ₃
Short Title	28001	00	00	* 0ardennes ₁ battle ₂ of ₃ the ₄ bulge ₅
	28002	00	00	* 0Ardennes ₁ Battle ₂ of ₃ the ₄ Bulge ₅
Series Statement	29001	00	00	* 0united ₁ states ₂ army ₃ in ₄ world ₅ war ₆ II ₇ the ₈ European ₉ theater
		01	01	00f ₁ operations ₂
	29002	00	00	* 0United ₁ States ₂ Army ₃ in ₄ World ₅ War ₆ II ₇ the ₈ European ₉ theater
		01	01	00f ₁ operations ₂
Publication Date	48002	00	00	* 01965.1
Series Statement	56002	00	00	* 0(United ₁ States ₂ Army ₃ in ₄ World ₅ War ₆ II ₇ the ₈ European ₉ theater
		01	01	00f ₁ operations ₂) ₂
Subject Terms	72001	00	00	* 0ardennes ₁ battle ₂ of ₃ the ₄ 1944 ₅ 1945 ₆
	72002	00	00	* 0Ardennes ₁ Battle ₂ of ₃ the ₄ 1944-1945 ₅

Figure 3
Computer-generated Prooflisting of Catalog Card

SUBJECT CATALOG		ART OBJECTS, CHINESE
66011706 APPLICATIONS FOR POSITIONS Rogers, Nellida How to land the position you want 1965.	595.7 L	Historical manuscript depositories in Pennsylvania 1965. Ref. 374.6 P
66011656 AQUARIUMS Asplund, Herbert R. Trop 66010652 Janey, A. O. Aquariae to 66010750	658.31 R	66011919 ARCTIC REGIONS Frauchan, Peter I sailed with Resaussen 1856. 66010406 E 8
AQUARIUMS, SALT-WATER Asplund, Herbert R. Salt- Rev. ed. 1965. 66010653		
AQUATIC SPORTS Andreasen, John Henry Skiing on water 3d ed. 1965. 66010623 707 A 1960		ARITHMETIC Eicholz, Robert E. Modern general aesthetics 1965. 511 C
ARBITRATION, COMMERCIAL--U.S. Lazarus, Steven Resolving business disputes 1965. 66010621 366.12 L		66010368 Stein, Edwin I. Refresher aesthetics with practical applications 1965. 510 S
ARLAY, FRANCES BURNAY D' Hawlow, Joyce History of Fanny Burnay 1956. 66010659 E A		66011106 ARITHMETIC--EXAMINATIONS, QUESTIONS, ETC. Arco publishing company, New York Civil service arithmetic and vocabulary CUNSLIST LIBRARIAN
ARCHEOLOGY--U.S., EASTERN Griffin, James Bennett Archeology of eastern United States 1952. 66010568 017.3 C		66010025 ART--ADDRESSES, ESSAYS, LECTURES Eliot, Alexander Sight and insight 1859. 66010392 761 E
ARCHITECTURE Gindom, Sigfried Architecture you and me 1956. 66010539 720 G		ART, CHINESE Eliot, Alexander Museum of fine arts Charles E Hoyt collection CUNSLIST LIBRARIAN
Asplund, John Seven lamps of architecture 1660. 66010667 720 R		66011436 760.51 H Jenyns, Soame Chinese art, the elnor arts, II 1965.
ARCHITECTURE, ANCIENT Frankfort, Henri Art and architecture of the ancient orient 1954. 66010601 722 F 1954		66010765 760 J Willitts, Willise Foundations of Chinese art from Neolithic pottery to modern architecture 1965.
ARCHITECTURE, BYZANTINE Kraushoener, Richard Early Christian and Byzantine architecture 1965. 66010761 723 X		66011326 760.51 W
ARCHITECTURE, COLONIAL Halsey, Richard Townley Haines Homes of our ancestors 1925. 66010668 749 H		ART--COLLECTORS AND COLLECTING Cooper, Douglas Great family collections 1965. 66010256 760 C
ARCHITECTURE--DETAILS Deer, Alston Early ironwork of Charleston 1941. 66010366 730.4 D		ART, COPTIC Veseli, Klaua Coptic art 1965. 66011312 760.32 W
ARCHITECTURE, DOMESTIC Gillies, Marv Davis McCall's book of modern houses Rev. ed. 1959. 66010561 726 C 1959		ART--ENGLAND Thomas, Gertrude Z. Richer than spices 1965. 66011240 914.2 T
Halsey, Richard Townley Haines Homes of our ancestors 1925. 66010669 749 H		ART--HISTORY Harris, Michael Rheto Arts 1965. 66010676 760 H
ARCHITECTURE, DOMESTIC--JAPAN Saiha, Kiyosi Contemporary Japanese houses 1964. 66011129 720.45 J		ART INDUSTRIES AND TRADE Eaton, Allen Mandersholt Handicrafts of New England 1949. 66010376 743.1 E
ARCHITECTURE, DOMESTIC--U.S. Nicholson, Arnold American houses in history 1965. 66010677 917.3 H		ART INDUSTRIES AND TRADE--SWEDEN Held, Arthur Contemporary Swedish design 1951. 66010665 760.46 H
ARCHITECTURE--ENGLAND Clark, Kenneth McKensie Gothic revival 1962. 66010220 724.3 C 1962		ART, IRANIAN Forede, Edith Art of ancient Iran 1965. 66011934 760.35 P
ARCHITECTURE, GOTHIC Clark, Kenneth McKensie Gothic revival 1962. 66010220 724.3 C 1962		ART, ITALIAN Chastel, Andre Golden age of the Renaissance 1965. 66011462 766.45 C
ARCHITECTURE--IRAN Pope, Arthur Upham Persian architecture 1965. 66011636 726.056 P		ART, MEDIAEVAL Loomis, Roger Sherman Mirror of Chaucer's world 1965. 66010647 821 L
ARCHITECTURE, MODERN--20TH CENTURY American federation of arts Fountains in contemporary architecture 1965. 66010616 731.722 A		ART--MESOPOTAMIA Hergueron, Jean Claude Mesopotamia 1965. 66010670 913.35 H
ARCHITECTURE--RUSSIA Hawilton, George Heard Art and architecture of Russia 1954. 66011650 760.47 H		ART--MEXICO Crosby-Kieball, Ingerd Art of ancient Mexico 1954. 66010593 913.72 G
ARCHIVES--PENNSYLVANIA--DIRECTORIES Pennsylvania. Historical and access commission		ART, MODERN--20TH CENTURY Ruh, Katharine Woolf Break-up: the core of modern art 1965. 66011706 760.64 A
		ART OBJECTS, CHINESE Boston. Museum of fine arts Charles E Hoyt collection

Figure 4
Subject Entry in Subject Index

AUTHOR CATALOG	CORTINA, RAFAEL OIEZ DE LA
08019217	B L
CLARK, BARRETT HARPER	How to pass common examinations, national teacher examinations. 1964.
World dress: Italy, Spain, France, Germany, Denmark, Russia, and Norway. 1933 Book II.	371.13 C
08019218	022.00 C
CLARK, JOHN GRAMANC DOUGLAS	COLLIER, ERIC
Prehistoric societies. 1965.	Three against the wilderness. 1959.
08019219	05819242
ELARA, JOSEPH B.	COLLING, HENRY HILL
Congressional reform. 1965.	Familiar garden birds of America. 1965.
08011480	08019243
CLARK, EDWENET MCARENZIE	COLLING, WILKIE
Gothic revival. 1962.	Short stories. 1959.
08019220	80019244
CLARY, JACK T.	CORANGINI, ABELE
Army versus Navy: seventy years of football rivalry. 1955.	Doctor Kete, engel on snowshoes: the story of K. P. Hucocob. 1959.
08019221	80019245
CLAUGHTON, EDWA F.	COMAY, JOAN
Let's throw a party. 1959.	Everyone's guide to Israel. Rev. ed. 1966.
08019222	80011400
CLETON, SLEW URILL	COMBES, ELIZABETH
General printing. 3d ed. 1963.	See Men, Sogles, pseud.
08011490	COMMERCIAL CLEARING HOUSE
CLUWARD, RICHARD A.	Guidebook to pension planning. 1964.
Bilingualism and opportunity. 1960.	08019246
08011491	COMINGS, JOHN ROGERS
COATES, ROBERT NYSON	Sociological view of sovereignty, 1899-1900. 1965.
Farther shore. 1955.	08019247
08019224	COMCROK, GEORGES
CORBAN, ALFRED	Savage state. 1965.
History of modern France. Rev. ed. 1960.	08019248
08019225	CONFUCIUS
COLBERT, STANTON ARTHUR	Sacred books of Confucius; and other Confucian classics. Tr. by CH' S. Chai. 1965.
Seasons, witch doctors, and modern man. 1965.	80011000
08019228	COMLIN, DAVID A.
Ten crises in civilization. 1965.	Grammar for written English. 1981.
08019227	80019249
CODRMAN, HAMILTON	COMNER, PAUL W.
Freedomers of the Red Sea. 1965.	Poor Richard's politicks. 1965.
08019220	80019250
COHEN, HARRY ALAN	CORRAD, DAVID EUGENE
Basic Jewish encyclopaedia. 1969.	Forgotten forefathers. 1965.
08019230	08019251
COIN WORLD (PERIODICAL)	COOR, MELVIN ALONZO
Guide to coins. 1964.	Science of high explosives. 1959.
08019231	80019252
COLBOURN, H. TREVOR	COOKE, NELSON NABOR
Leap of experience. 1985.	Electronics and nuclearics dictionary. 1960.
08019233	80019253
COLBY, CARROLL BURLING	COOLEY, JOHN A.
Wild dogs. 1965.	East wind over Africa. 1965.
08019236	80019254
COLEY, ELBRIDGE	COON, CARLETON STEVENS
Theodore Winthrop. 1965.	Living faces of war.
08011493	80019255
COLE, ANNA	COONEY, DAVID M.
Methodism in Old Haverly. 1933.	Chronology of the U.S. Navy: 1775-1985. 1965.
08019237	80011504
COLE, GEORGE DOUGLAS HOWARD	COOPER, DOUGLAS
Meaning of Heracles. 1949.	Great family collections. 1985.
08011494	80019256
COLE, HUGH MARSHALL	
Ardennes: Battle of the Bulge. 1965. (United States Army in World War II: the European theater of operations)	vic and succulense.
66010238	700.9 C
	v. and enl. ed. 1964.
	491.05 C
	3d. rev. ed. 1964.
	046.7 C 1904
08011496	373 C
COLES, MANNING, PSEUD.	CORNELIUS, CHARLES OVER
Negotiations. 1949.	Furniture accessories of Duncan Phyfe. 1922.
08011497	80019261
COLLEGE ENTRANCE EXAMINATION BOARD	CORRIGAN, ROBERT WILLOUGHBY
College handbook.	Coeddy, meaning and form. 1965.
CONGUL LIBRARIES	80019262
08019240	Tragedy, vision and form. 1965.
COLLEGE ENTRANCE EXAMINATION BOARD. COMMISSION	80019263
ON ENGLISH	CORSA, HELEN STORM
Freedom and discipline in English. 1965.	Chaucer, poet of birth and morality. 1984.
08011498	80019264
COLLEGE PUBLISHING CORPORATION	CORTINA, RAFAEL OIEZ DE LA
	Green in 20 lessons. 5th ed. 1962.

Figure 5
Author Entry in Author Index

AMERICAN GOSPEL OF SUCCESS		TITLE CATALOG	
86011400	917.3 B	Scheidt-Wilman, Knut Bortbecker 2d ed. 1984.	
AMERICAN GOSPEL OF SUCCESS Reichlin, Moses 1989.		86011114	691.1 S 1964
86011066	389.173 R	ANNALS OF BALTIMORE Griffith, Thomas Waters 1824.	
AMERICAN HOUSES IN HISTORY Nicholson, Arnold 1968. 86010977	917.3 H	86011860	nd. Ref. 876-26 G
AMERICAN ILIAD Eisenhild, Otto 1947. 86011386	973.7 E 1947	AMYNTHING BOOK Hedderston, Zenna 1888.	9F
AMERICAN LABOR TODAY Ware, Norbert Lewis 1960. 86011831		86011894	
AMERICAN LITERATURE Stallone, Robert Voneter 1981. 8611186		APPLIC OF HIS EYE Robichaud, Gerard 1985. 86011076	
AMERICAN NEGRO, A CHRONOLOGY AND FACT BOOK Bliss, Irving J. 1966. 86011179	Ref. 873.697 B	APPLIED BUSINESS LAW Fisk, McKee 8th ed. 1980. 86011802	247 F 1960
AMERICAN NOTEBOOK Hamburger, Philip Paul 1969. 86010616	917.3 H	APPRAISING AND SELLING YOUR COINS Friedberg, Robert 4th ed. 1984. 86010802	787.4 F 1984
AMERICAN POETRY SINCE 1940 Stepanovich, Stephen 1960. 86011260	811.49 B	AQUARIUM TECHNIQUES Jensen, A. G. 1984. 2v. 86010758	890.7 J
AMERICAN POETRY Ehrenpreis, Irvin 1966. 86011843	811.95 E	ARABESQUE Household, Geoffrey 1948. 86011710	
AMERICAN POLITICS AND THE PARTY SYSTEM Bonn, Hugh Alvin 3d ed. 1966. 86010112	324 B	ARCHAEOLOGY IN THE HOLY LAND Kempson, Kathleen Mary 2d ed. 1965. 86011797	913.204 K
AMERICAN STEAM VESSEL SERIES, V.1 Stanton, Samuel Ward Great Lakes steam vessels 1962. 86012021	387 B	ARCHAEOLOGY OF THE CINEMA Herek, Karl W. 1969. 86010980	778.5 R
AMERICAN STEAM VESSEL SERIES, V.2 Stanton, Samuel Ward Long Island Sound and Narragansett Bay steam vessels 1962. 86012022	387 B	ARCHIOLOGY OF EASTERN UNITED STATES Griffin, James Bennett 1882. 86010948	917.3 G
AMERICAN STEAM VESSEL SERIES Stanton, Samuel Ward Ocean 86012024	389.32 I	ARCHIBALD MACLEISH Falk, Signi Lenoe 1966. 86012048	811 H
AMERICAN STEAM VESSEL SERIES Stanton, Samuel Ward West States naval steam vessels 86012023	389.32 I	ARCHITECTURE YOU AND ME Gledson, Sigfried 1988. 86010839	725 G
AMERICAN STEAM VESSEL SERIES, V.3 Stanton, Samuel Ward Steamboats of the river Hudson 1965. 86012020	387 B	ART AND ARCHITECTURE OF RUSSIA Hamilton, George Heard 1984. 86011809	709.47 H
AMERICANS AND CHINESE Woo, Francis Lang Kwoeng 1963. 86010717	818.1 H	ART AND ARCHITECTURE OF THE ANCIENT ORIENT Frankfort, Henri 1964. 86010481	732 F 1964
AMERICA'S HOMEMAKING BOOK Godd, Marguerite 1967. 86011831	848 D	ART AND ARCHITECT (A C BARNES) Schach, Willian 1989. 86011378	6 S
AMPLIFIED SINGLE Sibley 1966. 86014103	224.6 B	ART OF ANCIENT ISRAEL Parada, Edith 1969. 86011934	700.20 F
AMULETS AND SUPERSTITIONS Wudge, Ernest Alfred Thompson Wallis 1939. 86010147	390.3 B	ART OF ANCIENT MEXICO Groth-Kibbell, Ingegard 1966. 86010993	913.72 C
ANARCHISM: A HISTORY OF LIBERTARIAN IDEAS AND MOVEMENTS Woodcock, George 1962. 86012117	336.02 W	ART OF MEXICAN COOKING Aron, Jan 1966. 86010001	841.0 A
ANATOMY OF GREATAIN TODAY Sawson, Anthony 1966. (Also published as Anatomy of Britain) 86011971	014.2 B	ART OF SOUTHEAST ASIA Louis Frederic, pseud. 1966. 86010849	700.69 L
ANCIENT ISRAEL Roux, Georges 1984. 86011086	913.36 R	ART OF THE PUPPET Baird, Bill 1965. 86010086	781.0 B
AND IT WAS MORNING Borchsenius, Pool 1962. 86011854	400.04 B	ART OF THE ROYAL BALLET Money, Kath 1964. 86010941	793.3 M
AND THE BAIN MY DRINK Hsu, Suzin, pseud. 1968. 86010618		ART, SCIENCE AND SPIRIT OF NURSING Price, Alice Louise 3d ed. 1966. 86011840	816.73 F 1965
ANDRE CHEWIER Luggins, Varcoe 1965. 86010122	B C	ARTILLERY THROUGH THE AGES Stevens, Phillip M. 1960. 86010231	368.1 B
ANIMAL PHYSIOLOGY Scheidt-Wilman, Knut Bortbecker 1960. 86011118	691.1 B	ARTIST'S LIFE Enters, Agnes 1988. 86010464	8 E
		ARTISTS OF THE OLD WEST Cuzars, John Canfield 1969. 86010430	768.1 E
		ARTS OF NARRING	

ARDENNES: BATTLE OF THE BELGE
Cole, Hugh Marshall 1965.
66010238

940.542 C

Figure 6
Title Entry in Title Index

TITLE CATALOG	UNIVERSAL DECIMAL CLASSIFICATION
66011936 TOOL DESIGN Donaldson, Cyril 2nd ed. 1967.	195.9 F
66010228 TDRAGENTS OF SPRING Hemingway, Ernest 1933.	631.0 D
66010058 TORTURER'S HORSE Luman, Robert 1969.	
66011720 TOWER OF KILRAVER Crown, Cecily 1969.	
66012278 TOVLANO Smith, Mark 1969.	
66011377 TRADITIONAL QUILTING Pitterson, Ralph, Maria 1964.	
66010468 TRAGEDY, VISION AND FORM Corrigan, Robert Willoughby 1960.	843.67 F
66010263 TRAGEDY Thorndike, Ashley Horace 1969.	699.2 C
66011244 TRAITOR BETRAYED Mills, Dunnington, pseud. 1934.	622.99 T
66010978 TRAVEL GUIDE TO THE ORIENT AND THE PACIFIC Valdo, Myra 1969.	N
66011298 TRAVELS OF MARCO POLO, THE VENESIAN Foley, Maran 1936.	619 V
66010332 TREASURY OF LIFE INSURANCE SALES IDEAS Crowley, Stanley A. 1965.	619 P 1933
66010113 TRIALS OF THE WORD Lewis, Richard Harrington Baldwin 1955.	866.66 C
66011011 TRIUMPHMENT Rana, Dorothy 2d ed. 1969.	619.0 L
66011346 TRIUMPHANT EMPIRE Gipson, Lawrence Henry British empire before the American Revolution	614 R
66010846 TRIUMPHS OF BIOLOGY Goldstein, Phillip 1966.	943.672 Q
66011823 TUDOR OF CONQUEST Sould, Cecil 1964.	674.95 Q
66011033 TROPICAL FISH BOOK Amelrod, Herbert A. 1964.	796.4 B
66010502 TABLETS IN BERELEY Harrsham, Steven 1969.	
66012492 TAMBOUR MOUTE Pomer, William Charles Fr.	
66011028 TASK MANAGEMENT Huxley, Howard Burton Rev. ed. 1942.	635.5 M
66010864 TURKEY Stewart, Desmond Stirling 1969.	619.5 B
66011265 TWENTIES: AMERICAN WRITING IN THE POSTWAR DECADE Hoffman, Frederick Jobe 1955.	616.9 M
66010899 TWENTIETH-CENTURY SHORT STORY EXPLICATION: SUPPLEMENT II. INTERPRETATIONS, APRIL 1, 1963- DECEMBER 31, 1964 OF SHORT FICTION SINCE 1909 Walker, Warren B. 1965.	Ref. 616.0 W 1960
66011282 TWENTY DAYS Rumhardt, Dorothy Maserva 1960.	B L
66010811 TWICE TWENTY-TWO: GOLDEN APPLES OF THE SUN, MEDICINE FOR MELANCHOLY Brenburg, Ray 1959.	37
66011444 TWILIGHT OF SAILING SHIPS	
Corn, Robert 1959.	
66011478 TWINE: TWICE THE TROUBLE, TWICE THE FUN Gohman, Selvy Holland 1950.	387.2 C
66010920 TWISTED PEOPLE Phillips, Julian Pentecost 1958.	198.444 Q
66011029 TWO ARRABISSOS Marlino, Renato 1969.	N
66011673 TWO DEATHS OF QUINCAR WATERYELL Azzari, Jorge 1959.	384.2 H
66011373 TWO LIVES OF EDITH WHARTON Griffiths, Grace Kellogg 1969.	B W
66011364 TWO THOUSAND YEARS OF CALLIGRAPHY Belliere, Renaud de art 1959.	741 B
66010668	
U	
UNCLE JOHN'S ORIGINAL BEARD BOOK Framm, John Rahn 2d an. ed. 1960.	641.5 B
66011448 UNCOMMON SENSE Kamietan, Kenneth 1969.	
66010760 UNDERSTANDING AMERICA'S INDUSTRIES Garbroski, Carl 1962.	361.2 X
66011010 UNDERSTANDING MACROECONOMICS Muller, Robert Louis 1960.	333 Q
66011893 UNDERSTANDING MAGAZINES Wolinsky, Roland Edgar 1969.	336.1 M
66012118 UNEXPLORED BOND Hartley, Arthur Sanford 1966.	681 W
66011871 UNHOLY ALLIANCE Fraud, Gerald 1967.	945.84 H
66010499 UNHOLY UPPOAR Gent, Clyde Brion 1967.	
66010268 URIONS BEFORE THE BAR Lieberman, Elias Rev. ed. 1945.	
66010839 UNITED STATES AND THE HAWAIIAN KINGDOM Tate, Marce 1969.	331.626 L
66011220 UNIVERSAL DECIMAL CLASSIFICATION	327.966 T
UNITED STATES ARMY IN WORLD WAR II: THE EUROPEAN THEATER OF OPERATIONS Cole, Hugh Marshall Ardennes: Battle of the Bulge 1965. 66010238 940.542 C	
PC(2)-98. SUBJECT REPORTS: INCOME OF THE ELDERLY POPULATION. U.S. Census, Bureau of the 1962.	66011275 Ref. 339.2 U
U.S. COAST GUARD Cappan, Walter C. 1969.	66011471 366.67 C
U.S. CODE, 1964 ED U.S. Laws, Statutes, etc. 1969. 14v.	66012071 Ref. 340 U 1965
UNITED STATES IN WORLD AFFAIRS, 1963 Stahlman, Richard Post 1964.	66011397 327.73 B 1964
UNITED STATES IN WORLD AFFAIRS, 1964 Owens, James 1965. (Former author Stahlman, Richard Post)	66011828 327.73 D
U.S. INFANTRY: QUEEN OF BATTLE Stallman, Richard Joseph 1959.	66012038 356.1 B
UNIVERSAL DECIMAL CLASSIFICATION	

Figure 7
Series Entry in Title Catalog

FISHLOCK, DAVID

Metal colouring. Teddington, R.
 Draper, 1962. xii, 393p. illus. (part
 col.) 23cm. Includes bibliographies.
 TS653.F53 64-35743

OKLAHOMA. STATE UNIVERSITY OF AGRICULTURE
 AND APPLIED SCIENCE, STILLWATER. SCHOOL
 OF CIVIL ENGINEERING.

Research publication. Stillwater, 19
 no.in v. illus. 29cm. Issued by the
 school under the university's shorter
 form of name: Oklahoma State
 University.

TA7.045

64-35744

UNITED NATIONS. OFFICE OF PUBLIC
 INFORMATION

The International Court of Justice.
 [4th ed.] New York, United Nations
 (1963[41p. illus. 20cm. =United
 Nations publications. Sales
 no.:63.I.11"

JX1971.6.U47

64-54693

Figure 8
 Sample Computer Print of L. C. Entries

AUTHOR CATALOG

HOSKINS, WILLIAM GEORGE

- HENRY FRANCIS DE PONT WINTERHUB**
ME SLM.
Wentworth portfolio one c1964 708 1 H
- HENRY, O. PSEID D.**
Ceresia graduate 1904
0265-12323
Heart of the mill. 1904
0265-12324
0265-12324
Omnium 1909
0265-12325
Roasts of destiny. 1903
0265-12326
Sins and virtues. 1904
0265-12327
Society business. 1910
0265-12328
Tramontano 1907
0265-12329
Voice of the city. 1908
0265-12330
- HEPNER, HARRY WALTER**
Advertising creative communication with consumers
4th ed. c1964 659 1 H
- HERBERMANN, CHARLES GEORGE**
Subjuncts in the United States c1918
0185-12844 271 75 H
- HERBERT, ALAN PATRICK**
Barclay M. P. 1964
0265-12361 340 0 H
- HERBERT, SIR HENRY**
Dramatic records of Sir Henry Herbert 1817
0265-12318 792 G
- HERLING, JOHN**
Labor unions in America 1964
0265-12362 131 8 H
- HERNTON, CALVIN C.**
Sea and sports in America 1945
0265-12363 131 8 H
- HERB, DAN**
Raffles and sports 1964
0265-12364 0 H
- HERBIE, CHARLES JUDSON**
Brains of rats and men. c1963
0265-12365 596 H
- HERBIE, BENNETH W.**
Total disability provisions in life insurance
contracts c1956 368 2 H
- HERBY, JOHN RICHARD**
Campaign for Adano 1940
0265-12365 368 2 H
- HERZ, LOUIS HEIBRONER**
Complete board of model railways and roadways
1964 629 2 H
- HERZOG, ARTHUR**
New steam establishment. 1963
0265-12366 353 H
- HESSELTINE, WILLIAM BEST**
Lincoln's plan of reconstruction. c1960
0265-12368 973 7 H
- HEI BONG, JACQUES**
Daily life of the Etruscans. c1964
0265-12369 913 37 H
- HEI SPRUEG, HELEN**
HEI been ideas in live with you mine 1964
0265-12370 913 3 H
- HEWITT, ALEXANDER**
Historical account of the rise and progress of the
colonies of South Carolina and Georgia. 1779 2c.
0265-12380 973 7 H
- HEVEL, CARL**
Approving artistic performance. c1958
0265-12381 658 3 H
- HEWLOCK, JOHN**
Management for modern supervisors. c1962
0265-12382 658 3 H
- HEVER, ANNA HABBET**
See American library association
- HEWSON, JOHN**
Radio astronomy and how to build your own telescope.
c1963 523 H
- HIBBERT, CHRISTOPHER**
Crest at Windsor. 1964
0265-12371 920 H
- HIGDON, HAL**
Union vs. Dr. Mead c1964
0265-12394 8 H
- HILDRETH, GERTRUDE HOWELL**
Teaching reading: a guide to basic principles and
modern practices. c1958 272 A H
- HILL, JIM DAN**
Moose men to peace and war; a history of the National
Guard. c1964 353 3 H
- HILL, NAPOLEON**
Think and grow rich. c1937
0265-12387 174 H
- HILL, RALPH NADING**
Mad doctor's drive being an account of the first
death over the U.S.A. San Francisco to New York,
1902, in 48, city-free days on a Weston motor carriage.
c1964 917 3 H
- HILL, WILLIAM H.**
Ammo Braveros, his life and work (1844-1737).
c1963 787 12 H
- HILLARY, EDWARD**
Scholarship in the clouds. 1964
0265-12372 915 496 H
- HILLARY, LEUISE**
Keep calm if you can c1964
0265-12373 796 34 H
- HILLCOCK, WILLIAM**
Rader-Fordell, the two lives of a hero. c1964
0265-12301 B B
- HILLWAY, TYRIS**
Education in American society, an introduction to the
study of education. c1961
0265-12302 370 1 H
- MINDE, THOMAS (PSEID.)**
See Ching, Thomas
- HINMAN, CHARLTON**
Pressing and proof-reading of the first folio of
Shakespeare. c1962 2c.
0265-12303 822 3 H
- HIRSCHMAN, ALBERT D.**
Courses toward progress, studies of economic policy-
making in Latin America. c1962
0265-12304 338 98 H
- HISTORY OF CIVILIZATION**
History of civilization, ed. by C. H. King 2nd ed.
c1964 2c.
0265-12305 801 0 H
- HISTORY OF ROME AND THE ROMANS, FROM
ROMI LI X TO JOHN XIII.**
History of Rome and the Romans, from Romulus to
John XIII General director, Robert Laffont. c1960
0265-12306 963 63 H
- HITLER, ADOLF**
Militarism. c1964
0265-12375 940 34 H
- HORTSANG, CARL**
American chess director. c1961
0265-12307 766 H
- HOGG, EDWIN**
American houses, colonial, classic and contemporary.
c1960 728 H
- HOBART, ALICE THOSALE NOURSE**
Clio. 1965
0265-12375 728 H
- HOBHOUSE, LEONARD TRELAWNEY**
Liberation. 1964
0265-12376 320 1 H
- HOBSON, LAI BA BLANE ZAMETIN**
First paper. c1964
0265-12376 320 1 H
- HODGE, ANDRE**
Basic in education and science. c1958
0265-12311 781 57 H
- HODGSON, JOHN H.**
Etruscans and earth structure. c1964
0265-12311 551 2 H
- HODGSON, RICHARD S.**
Dated James mail and steel order handbook. 1964
0265-12378 859 133 H
- HOERNES, GLENNARD E.**
Introduction to Boolean algebra and logic design,
a program for self-instruction. c1964
0265-12314 312 89 H
- HOFER, ERNST**
Arco. Rome. c1957
0265-12315 919 0 H
- HOFFMAN, ARTHUR S. LEVANT**
Writing of fiction. c1954
0265-12317 808 3 H
- HOFFMAN, MARTIN LEON**
Review of child development research. 1964
0265-12379 176 7 H
- HOFFMAN, NH HOLAS VON**
Munichian notebook. 1964
0265-12380 323 H
- HOFMEIER, JOHANNES**
Art of teaching Christian doctrine. 2nd rev. and
ed. c1962
0265-12316 236 2 H
- HOFFMAN, JULIUS**
History of Zion Church of the city of Baltimore, 1755-
1897. 1960
0265-12319 846 284 1 H
- HOFSTADTER, RICHARD**
Great issues in American history. 1958 2c.
0265-12381 973 H
- HOGAN, ROBERT GOODE**
United States, history of a republic. c1957
0265-12321 973 H
- HOGARTH, PAUL**
Arthur Miller. c1964
0265-12322 812 H
- HOGG, GARRY**
Hammor and songs. 1964
0265-12323 941 H
- HOGNER, DOROTHY CHILDS**
Gardening and cooking on terrace and patio. c1964
0265-12324 662 H
- HOMENBERG, JOHN**
Foreign correspondent; the great reporters and their
times. 1964
0265-12325 070 43 H
- HOLCOMB, RICHARD LDBAN**
Police and the public. c1954
0265-12326 352 2 H
- HOLDEN, JOHN L.**
Young collector's guide to stamping. c1962
0265-12327 786 58 H
- HOLLER, ROBERT**
Complete guide to successful school publications. 1964
0265-12328 371 62 H
- HOLLE, CHRISTINA**
Christmas and its customs, a brief study. c1957
0265-12329 794 H
- HOLLAND, LYNNWOOD MATHIS**
Perry M. B. Young, the Warwick of the South. c1964
0265-12329 874 H
- HOLLANDER, LEE M.**
Saga of the Ironworkers. c1955
0265-12867 839 8 J
- HOLLEY, IRVING BRINTON**
Boy's march: material procurement for the Army Air
Forces. 1964 [U.S. Army in World War II Special
studies] 358 A H
- HOLLIS, CHRISTOPHER**
Papacy, an illustrated history from St. Peter to Paul VI.
c1964 262 13 H
- HOLMAN, MARY**
Police officer and the child. c1962
0265-12331 364 44 H
- HOLMES, FRANK WENDALL**
Malvern's station letters, correspondence of Mr. Justice
Holmes and Lewis Easton, 1903-1915. c1964
0265-12332 8 H
- HOLST, HENNING**
A.R.M. of music. 1963
0265-12327 781 H
- HOLZ, J. ALONZO III**
How children fail. c1964
0265-12333 372 H
- HOLL, P. PAI M.**
Kolumbia today and tomorrow. 1964
0265-12334 918 63 H
- HOLT, S. H. FERRIS**
Legends of the earth-crop. c1963
0265-12334 918 63 H
- HOLETON, DANIEL CLARENCE**
Holeton, John, and Home Automation. Rev. ed.
0265-12329 299 1 H
- HOLTON, FREDAL**
Foundations of modern physical science. c1964
0265-12335 130 H
- HOLTON, HENRY HENRI**
Home teaching ideas for 1965. 1964
0265-12336 547 8 H
- HOMI, IMPROVEMENT IDEAS FOR 1965**
Home improvement ideas for 1965. 1964
0265-12337 918 6 H
- HONDIYAN, JOHN**
Introduction to the chemistry of carbohydrates. 2d ed.
c1964 547 78 H
- HONDIYAN, JOHN JOSEPH**
Lipids and porphyry. c1964
0265-12338 133 H
- HONDIYAN, JOHN**
Lipid of life. c1964
0265-12339 547 78 H
- HONDIYAN, NINA WARNER**
Sea summer. 1964
0265-12340 599 74 H
- HONSTON, BRIE E.**
Mother and child in modern art. 1964
0265-12340 599 74 H
- HOPKINS, HENRY HOUSTON**
Georgia O'Keefe. c1962
0265-12339 821 G
- HOPKINS, ALBERT**
Scout Africa. c1964
0265-12341 918 6 H
- HOPPE, ARTHUR W. WATTERS**
Dreamboat. c1964
0265-12342 332 82 H
- HOBIE, MIKED**
International monetary fund. 1964
0265-12343 918 6 H
- HORN, ALFRED ALVIN N. PNEI D.**
Transfer. Rome. 1927
0265-12395 8 H
- HORN, TOM**
Life of Tom Horn, government scout and interpreter.
c1964 794 1 H
- HORN, HAROLD M.**
Lipid insurance contract. 2nd ed. c1964
0265-12343 368 3 H
- HORODISCH, ABRAHAM**
Picasso as a book artist. c1962
0265-12344 Ref 341 84 P
- HOROWITZ, HAROLD ALBERT**
Mac's guide to New York City. c1964
0265-12345 673 471 H
- HOROWITZ, ISRAEL ALBERT**
New steps in the cheer opening. 1964
0265-12346 794 1 H
- HORTON, JOHN**
Economic man: a short history. c1963
0265-12346 790 968 H
- HORTON, WALTER MARSHALL**
Christian theology, an ecclesiological approach. Rev.
and 2nd ed. c1958
0265-12347 230 H
- HOSKINS, WILLIAM GEORGE**
Young collector's guide to stamping. c1962
0265-12348 942 H

Figure 9
Sample Photocomposed Page