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Special Libraries, March 1956

Special Libraries Association

SPECIAL LIBRARIES

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MARCH 1956

VOLUME 47 NUMBER 3

CLASSIFICATION and INDEXING SYSTEMS

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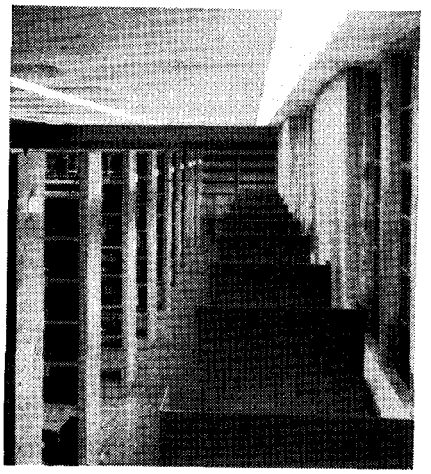

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THE 47th ANNUAL CONVENTION WILL BE HELD AT THE HOTEL WILLIAM PENN, PITTSBURGH, PA., JUNE 3-7, 1956

PUBLICATIONS

Aviation subject headings, *1949*	$1.75	Libraries for research and industry—planning and equipment (SLA monograph no. 1), *1955*	$3.00
Bibliography of engineering abstracting services (SLA bibliography no. 1), *1955*	1.50	Map collections in the U. S. and Canada; A directory, *1954*	3.00
A brief for corporation libraries, *1949*	1.75	Nicknames of American cities, towns and villages past and present, *1951*	2.00
Contributions toward a special library glossary. 2nd ed., *1950*	1.25	SLA directory of members, *1951*	4.00
Correlation index document series & PB reports, *1953*	10.00	Source list of selected labor statistics, rev. ed., *1953*	2.00
Creation & development of an insurance library, rev. ed., *1949*	2.00	Subject headings for aeronautical engineering libraries, *1949*	4.00
Directory of special libraries, *1953*	5.00	Subject headings for financial libraries, *1954*	5.00
Fakes and forgeries in the fine arts, *1950*	1.75	Technical libraries, their organization and management, *1951*	6.00
Indexing—with emphasis on its technique: An annotated bibliography, *1955*	.50	Visual presentation. Our library, *1953*	5.00

TECHNICAL BOOK REVIEW INDEX—Subscription, $7.50; Foreign, $8.00; Single copies, 75¢

SLA'S PUBLISHING PROGRAM: *NON-SERIAL PUBLICATIONS*

Since 1945 Special Libraries Association has contributed twenty-nine publications to library literature, an average of just under three a year. With few exceptions, SLA publications have been compiled, written, or edited by members of the Association who have contributed their time and work to further the profession of special librarianship. Considered as a whole these publications have more than paid their printing costs and during the past few years have contributed approximately $3,000 a year to the salaries of the editorial staff at Headquarters.

In turn, the budget for general operations has absorbed the cost of handling the sales of all publications, including storage and promotion. Advertising space in other library journals is made available by the exchange of space in SPECIAL LIBRARIES. As with other activities of the Association, no exact allocation of the overhead cost of Headquarters is charged to the publications program. However, if the facilities of Headquarters were not available, these services would have to be provided in some other way.

Prior to 1951 *Institutional* members were entitled to receive all nonperiodical publications of the Association without charge. This provision was changed in 1951 and *Institutional* members now receive a 50 per cent discount on all such publications. This is a factor that is considered when the price of any publication is determined.

In 1949 a Publications Fund was established in which all receipts from the sale of publications are deposited and from which all direct costs such as printing, postage, and mailing containers are paid. The Fund was established to cushion the general funds of the Association against large expenditures for printing which are not related to current income and are difficult to budget in advance.

The Fund has grown over the intervening period from $2,672 in 1949 to $25,198 at the end of 1955. Of the latter amount, $17,371 is cash and $7,827 represents inventory of publications. Income for 1955 from sales of 3,029 publications amounted to $7,939 and almost sixty items were distributed each week. Income per copy averaged only $2.62 because of the large number of low priced items sold last year. Handling a fifty cent pamphlet takes just as much time as filling an order for a ten dollar book while the financial return is much smaller. However, the value of a publication to the profession cannot be judged by its price and some of our less expensive publications are most useful tools.

As long as we depend solely on members of the Association for manuscripts the expansion of our publishing program will be limited. There is, however, a growing demand for tools in the library field. In addition to encouraging Divisions, Committees, and Chapters in projects leading to Association publication, some consideration might be given to publishing material in the special library field submitted by other organizations and by nonmembers. In whatever way the publications program develops, it will continue to be one of the most influential and far-reaching activities of the Association.

LUCILLE JACKSON
Chairman, Committee on Non-Serial Publications

E. G. BRISCH:
Something New in Classification

BARBARA KYLE
Chairman, Council of Aslib
Social Sciences Documentation, London, England

EDWARD G. BRISCH devised his first classification in 1926 when, as a young engineer and deputy chief designer of a motor car factory, he was faced with the task of putting in order an unwieldy mass of tracings, lists, and schedules supplied by a licensing firm for launching a new production. On his own admission a lazy man and one deprived almost entirely of memory, he had to design something that would enable him quickly to find what he quickly put away. Since then he has had many more opportunities to design systems as a classification and coding consultant to over two hundred clients, half of them firms and organizations of national and international repute.

His work is built essentially on three principles of classification:

1. That any item or concept must be classified according to its basic permanent characteristic, from the point of view of the ultimate user.
2. That the whole range of items considered must be covered.
3. That all categories must be mutually exclusive.

His work in its final form takes the shape of individually designed code books, enabling the user not only to find any desired item at very short notice and to feel certain that nothing has been omitted, but also to simplify and standardize by eliminating unnecessary varieties and recording, arranging, and controlling the necessary ones.

Acting on his experience in the field of industrial classification, E. G. Brisch now applies the same principles to documentation. Among his more recent work in this field can be mentioned classifications for the European Productivity Agency of the Organization for European Economic Cooperation, for the Modular Society in England, and for the film industry. He has also devised a classification for the Music Library of the British Museum which is now under consideration. In this brief article I hope to make his methods more widely known.

The quickest way to make clear a system of classification either to the layman or to the librarian is, after the briefest introduction, to demonstrate it by classifying and then retrieving items from a body of material. This is the method I intend to adopt here. The first difficulty is to choose a subject field which will not immediately antagonize or bore that part of one's audience unfamiliar with its terminology. I have therefore chosen to illustrate "special purpose classifications" in a field familiar to most readers — nursery rhymes.

The basic operations of the method are:

1. Analysis of the material from the point of view of the intended user (in the case of nursery rhymes we will suppose the child).
2. Arrangement of the concepts into categories relevant to the user and based on the preceding analysis.

3. A synthetic notation that consists of a combination of brief symbols representing different categories which are not themselves minutely subdivided.

The advantages of the system are:

1. Simplicity of operation once the schedules have been composed.
2. A constantly mnemonic and economic notation.
3. Appropriateness to the needs of the user.
4. Ability to express complex subjects.
5. The length of notation employed for any given search is related to the quantity of material.

These points should become clear by demonstration. To refresh our memories I will quote four nursery rhymes which will serve as examples:

Mary had a little lamb
Whose fleece was white as snow,
And everywhere that Mary went
That lamb was sure to go.

Little Jack Horner
Sat in the corner
Eating his Christmas pie.
He put in his thumb
And pulled out a plum
And said "What a good boy am I!"

Doctor Foster
Went to Gloucester
In a shower of rain.
He stepped in a puddle
Right up to his middle
And never went there again.

Hey diddle diddle!
The cat and the fiddle!
The cow jumped over the moon.
The little dog laughed
To see such sport
And the dish ran away with the spoon.

Now let us analyze the material from the point of view of the user, the child who requires for recitation a particular nursery rhyme about which he has some vague data remembered from previously hearing it. He may remember a proper name such as Mary, or that a little girl named or unnamed appeared in the story, that a particular animal was mentioned, or that something was eaten, or someone was cruel, or that there were jingles of funny words. We can now begin to think in categories related to the inquirer's approach to the subject. After several

E. G. Brisch

drafts and tests we can attach a notation to our schedules of categories and the result is the following classification:

00 NAMES — WORDS — JINGLES
- 01 Men's and boys' names
- 02 Women's and girls' names
- 03 Animal names, e.g. Baa Lamb, Cock Robin
- 04 Funny names, e.g. Humpty Dumpty
- 05 Names of days, months, birthdays
- 06 Meaningless jingles, e.g. Higgledy Piggledy
- 07 London
- 08 Place names except London

10 HUMAN AND SUPERNATURAL BEINGS
- 11 Men, kings, fathers, husbands, masters, sirs, uncles
- 12 Women, queens, mothers, wives, mistresses, dames, aunts
- 13 Boys, princes, sons, brothers
- 14 Girls, princesses, daughters, sisters
- 15 Ogres, giants, genii
- 16 Fairies, dwarves, gnomes, elves
- 17 Trades and professional people, e.g. doctors, parsons, bakers
- 18 Soldiers, armies, crowds, servants

20 THE BODY AND ITS PARTS
- 21 Head and parts, hair, eyes, nose, forehead, mouth
- 22 Trunk
- 23 Arms, hands, fingers, thumbs
- 24 Legs, feet, toes
- 25
- 26
- 27
- 28

30 FAUNA AND FLORA
- 31 Beasts
- 32 Birds
- 33 Insects
- 34 Water animals, fish
- 35 Flowers
- 36 Fruit
- 37 Vegetables including corn
- 38 Trees, bushes, shrubs, grasses

40 ACTIONS AND BEHAVIOUR (1)
- 41 Being born, being ill, dying
- 42 Eating, drinking, being greedy
- 43 Growing, producing, making, harvesting, selling
- 44 Preparing, cooking
- 45 Being kind, helpful, loving, giving, curing, good
- 46 Being cruel, fighting, hating, injuring, killing, bad
- 47
- 48 Writing, teaching, reading

50 ACTIONS AND BEHAVIOUR (2)
- 51 Lying down, sitting
- 52 Standing, running, falling down
- 53 Riding, flying, travelling, escaping
- 54 Gestures of anger, scorn, stamping
- 55 Gestures of goodwill, smile, wink, nod
- 56
- 57
- 58

60 OBJECTS — POSSESSIONS — IMPLEMENTS
- 61 Clothes, rags, adornments, jewels
- 62 Weapons, sticks, stones, guns
- 63 Furniture, utensils, tables, beds, chairs
- 64 Means of transport
- 65 Food, pies, cake, bread, wine, milk, water
- 66 Musical instruments, toys
- 67 Books, pen, ink, paper
- 68 Other implements, clocks

70 WEATHER — SCENERY — PLACE
- 71 Weather, climate, season
- 72 Moon, sun, stars, sky, air
- 73 Water, river, sea, lake
- 74 Outdoors, natural—fields, woods, caves, hills
- 75 Outdoors, man-made — town, streets, bridges, walls, gardens
- 76 Buildings, castles, houses
- 77 Rooms, passages, windows, doors
- 78

80 QUALITIES
- 81 Colours, light and bright, white, red, gold
- 82 Colours, dim and dark, black, brown
- 83 Pretty, beautiful
- 84 Ugly, hideous, crooked, misshapen
- 85 Big, tall, huge, fat, great
- 86 Little, tiny, wee, thin, small
- 87 Number, quantity, few, many, 10, 100, 10,000
- 88 Value, price, poor, rich

It will be seen that the whole subject has been covered in a comparatively small number of headings or *chapeaux*, each of which comprises a cluster of concepts, and that the whole classification can be printed on one sheet of paper, making even an index unnecessary in this case.

Now assume that each of 500 or 5,000 nursery rhymes is printed either on a card with 72 numbered punch holes around the edge or on a number of unpunched cards each bearing in the top right-hand corner a stamp consisting of nine squares numbered 0 to 8. (The number 9 is always reserved for further expansion.)

We can now proceed to code our material. All concepts should be coded, whereas in the examples given here only a selection of codings is shown.

Beginning with "Mary had a little lamb . . .", three categories are clear and a fourth is implied; first, girl's name—02; second, size—86; third, animal—31; and fourth, girl—14. Punched cards are therefore cut at holes 02, 86, 31, 14, or four cards are marked as shown in Figure 1 and filed respectively at 02, 14, 31, 86. So far the first four advantages are demonstrated — simplicity, economic and mnemonic notation, appropriateness, and ability to express complex concepts. The fifth advantage is achieved by operating only as much of the code as the quantity of material makes necessary.

0	1	2	3	4	5	6	7	8
2	*4*		*1*					*6*

Figure 1—An unpunched card with *chapeaux* numbers for "Mary had a little lamb . . ." marked on the lower line.

If the number of nursery rhymes that appear on needling the punched cards for proper names of women and girls (02) is only ten, one can quickly glance at all ten and find what he needs with-

out further needling. If one hundred cards appear he will sieve these through another network of concepts by needling the one hundred cards for animals (31). If this reduces the packet to ten cards, no more is necessary, but if too many cards are still left, he must reneedle by size (86), and again, if necessary, by girls (14). These four processes should reduce any reasonable collection of nursery rhymes to "Mary had a little lamb . . ." and "Little Bo Peep has lost her sheep . . .", between which the inquirer can reasonably be asked to choose and he may indeed be pleased to have both.

Coding for the other three rhymes are given in Figures 2, 3, and 4.

0	1	2	3	4	5	6	7	8
1	3	*3*		*2*		*5*		*6*

Figure 2—*Chapeaux* numbers for "Little Jack Horner . . ." indicate little, boy, boy's name, eating, pie, and thumb.

0	1	2	3	4	5	6	7	8
1 *8*	*7*						*1*	

Figure 3—*Chapeaux* numbers for "Doctor Foster . . ." indicate doctor, man's name, place name, and weather.

0	1	2	3	4	5	6	7	8
6			*1*			*3* *6*	*2*	

Figure 4—*Chapeaux* numbers for "Hey diddle diddle! . . ." indicate jingle, animal, moon, utensils, and musical instrument.

This system of classification, while it is simple and economic to use, cannot be designed by the amateur. Not only must it be designed by experts, but also by experts in consultation with the user and after careful and detailed study of the material. The simplicity and economy achieved in its use depend upon its absolute appropriateness to its context. This point has perhaps hardly been given enough emphasis in the example quoted, for the terminology of nursery rhymes is familiar to us all as household words, and this, alas, is not true of all fields of knowledge.

The Brisch system has, however, been put to practical use in a number of technical fields and in an appendix to this article an example is given of its use in the field of building. Here again it will be seen that no index is needed, there being only 81 headings or *chapeaux*. Nevertheless, concepts of great complexity can be precisely defined by combining a number of *chapeaux*. For instance, a document dealing with the thermal properties of steel in making doors for refrigerators would be coded as shown in Figure 5.

0	1	2	3	4	5	6	7	8
	3		*5*		*3* *8*			

Figure 5—*Chapeaux* numbers in the Brisch Building Classification above denote thermal properties, steel, doors, and refrigerators.

In retrieving material only as much decoding is done as is necessary to isolate a sufficiently small body of material. For instance, if edge-punched cards are being used, 13 is first needled. This will isolate all documents dealing with thermal properties. From this material a smaller quantity dealing with a more precise subject will be isolated by needling 35 for steel. This will give all material dealing with thermal properties of steel. The process is repeated until the particular documents required are isolated.

It should be remembered that while the collection of material is small the process of needling can be halted at the point at which it is quicker to scan than to re-needle the amount of material isolated. Thus one never uses a classification too elaborate for the particular search, because in preferring appropriateness to universality E. G. Brisch has been able to apply the modern theory of facet-analysis with unaccustomed simplicity and economy.

APPENDIX

BRISCH BUILDING CLASSIFICATION*

The Brisch Building Classification has been devised in consultation with the Ministry of Works, the British Standards Institution, and the Modular Society.

For the Modular Catalogue each pair of digits as shown in the table below, represents a concept and every sheet in the catalogue is classified by from one to nine pairs of digits, each in its appropriate place in the box at the top-right of the sheet which has nine subdivisions—one for each of the main headings 00 to 80 listed below.

For example, the first sheet in the catalogue is classified thus:—

01	35	63
11	43	74

indicating:

modular design	steel	framework
standardized	sections	schools

leaving empty the spaces in the box that do not apply.

The user of the catalogue can collect his sheets under whichever concept interests him most, with cross-references if he wishes to the others. Two blank sheets follow for the convenience of users in making their index. Alternatively, additional copies of the sheets are purchasable from the Modular Society for filing simultaneously under several different concepts.

This method of classification provides in advance an orderly arrangement for the sheets, permitting them to be published in random sequence as material is received. Here follows the table of two-digit concepts:—

00 GENERAL. GENERAL CONCEPTS. OPERATIONS
- 01 General Concepts. Regulations. Modular Coordination. Supervisory Operations. Designing. Specification
- 02 Preparatory Work on Site. Demolition. Excavating
- 03 Concreting. Bricklaying. Plastering. Stoneworking
- 04 Drainlaying. Asphalting. Paving and Flooring. Slating and Tiling. Carpentry and Joinery
- 05 Installation of Water, Electricity, Gas
- 06 Glazing. Painting. Fixing
- 07 Welding. Surface Treatment. Cleaning. Maintenance
- 08 Special Operations directed against Fire, Damp, Noise, Pests, Nuisances, Danger
- 09 Reserved

10 PROPERTIES. CHARACTER. QUALITIES
- 11 General Characteristics. Ready-made. Standardized. Purposemade. Ornamental. Coloured
- 12 Mechanical Properties
- 13 Thermal Properties
- 14 Acoustic Properties
- 15 Electrical Properties
- 16 Physical Properties other than 11/15
- 17 Chemical Properties
- 18 Properties other than 11/17
- 19 Reserved

20 MATERIALS EXCEPT FIBROUS MATERIALS AND EXCEPT METALS
- 21 Earth. Sand. Stones. Aggregates
- 22 Lime. Plaster. Chalk. Mortar. Cement. Concrete
- 23 Water. Air
- 24 Bituminous Materials. Mastics. Lubricants. Fuels. Gases
- 25 Rubber. Plastics. Silicates. Glass. Mica. (For Fibrous Plastics see 34)
- 26 Adhesives. Resins
- 27 Painting, Colouring, Decorating Materials. Putty
- 28 Fine Chemicals. Cleaning, Polishing and Preservative Materials. Disinfectants. Pest Control Agents. Mortar Additives
- 29 Reserved

30 FIBROUS MATERIALS. METALS. COMPOSITE MATERIALS
- 31 Wood. Cork. Paper. Straw. Reed
- 32 Vegetable Fibrous Materials other than 31. Cotton. Flax. Hemp. Jute
- 33 Animal Fibrous Materials. Wool. Silk. Hair. Leather. Bone
- 34 Mineral Fibres. Asbestos. Man-made Fibres. Rayon. Nylon
- 35 Iron. Steel. Ferrous Alloys
- 36 Non-Ferrous Metals and their Alloys
- 37 Metallization Materials. Soldering Materials. Welding Materials
- 38 Combinations of Materials
- 39 Reserved

40 FORMS
- 41 Fluid. Paste. Powders. Crystals. Granulated. Loose Fibres
- 42 Bricks. Blocks. Slabs. Slates. Tiles. Shingles
- 43 Rods. Bars. Battens. Laths. Scantlings. Baulks. Planks. "Shaped" Sections. Standard Sections. Extrusions. Beading, Mouldings
- 44 Wire. Rope. Yarn. String. Thread
- 45 Plates. Sheets (Rigid and Flexible, Woven, Felted, Corrugated, Perforated, Expanded, Mesh, Net). Strip. Tape

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46 Tubes (Rigid and Flexible)
47 Forms of Joints
48 Non-continuous Sections. Castings. Forgings. Pressings. Stampings. Carvings. Modelled Objects
49 Reserved

50 ASSEMBLIES. COMMERCIALLY AVAILABLE COMMODITIES OTHER THAN MATERIALS
51 Fixings and Fastenings
52 Hardware
53 Doors. Windows. Ventilators. Shutters. Trapdoors
54 Pipes. Pipe Fittings. Storage Tanks. Water-Softeners. Filters
55 Sanitary and Drainage Fittings, except Kitchen Sinks
56 Lighting and Heating Equipment. Cookers
57 Furniture. Furnishings
58 Household Equipment. Kitchen Utensils and Equipment other than Cookers. Vacuum Cleaners. Sewing Machines
59 Reserved

60 FUNCTIONAL COMPONENTS. ELEMENTS. PARTS OF BUILDINGS. INSTALLATIONS
61 Yards. Paths. Gates. Fencing. Kerbs. Channels
62 Foundations. Walls. Damp-proof Courses. Partitions. Pillars. Arches. Dressings. Flashings.
63 Framework. Stanchions. Beams. Trusses. Rafters. Studs. Stiffeners. Portals
64 Floors. Ceilings. Roofs
65 Stairs. Lifts. Ducts. Flues. Guards to Stairs and Lifts
66 Rooms. Cellars. Corridors. Attics
67 Complete Installations. Hot and Cold Water Systems. Gas. Electricity. Heating and Ventilating. Telecommunication
68 Drainage and Sewage Installations. Refuse Disposal Systems. Fire-fighting Installations and Apparatus
69 Reserved

70 LAND. BUILT-UP AREAS. COMPLETE STRUCTURES
71 Land. Built-up Areas. Open Spaces
72 Dwellings. Houses. Outbuildings
73 Buildings for Industry, Commerce, Agriculture. Inns
74 Buildings for Education and Science. Monuments. Religious Buildings
75 Buildings for Health, Welfare, Entertainment and Recreation
76 Public Service Buildings, except for Transport
77 Structures for Transport by Road, Rail, Water, Air
78 Structures other than 71/77. Dams. Water Towers. Windmills. Tropical Buildings. Arctic Buildings
79 Reserved

80 BUILDING PLANT. INSTRUMENTS. TOOLS. MACHINERY. VEHICLES
81 Excavating, Earth-moving and Road-making Equipment
82 Construction Plant and Equipment. Scaffolding. Concrete Mixers. Buckets
83 Hoisting and Conveying Machinery. Jacks. Cranes
84 Small Tools. Hand Tools and Implements
85 Machine Tools
86 Measuring, Recording and Testing Instruments. Laboratory Equipment
87 Vehicles. Marine Craft. Aircraft
88 Building Users Special Plant and Machinery
89 Reserved

90 RESERVED

A further development of the classification, taken to three digits instead of two, is available. This subdivides each of the two-digit concepts listed above into nine parts: but the two-digit system, detailed above, is considered sufficient for many purposes including the Modular Catalogue.

NEW LOOK IN MANUAL METHODS by Robert W. Gibson and Ben-Ami Lipetz
USE OF THE ASM-SLA METALLURIGCAL LITERATURE CLASSIFICATION SYSTEM BY INDUSTRIAL METALLURGISTS by E. C. Wallace
USE OF THE UNITERM COORDINATE INDEXING SYSTEM IN A LARGE INDUSTRIAL CONCERN by R. L. Francisco
were presented at a symposium, *Indexing Systems in Industrial Laboratories,* conducted by the Metals Division, Special Libraries Association, on October 20, 1955 in Philadelphia. Reprints of these articles, as well as E. G. BRISCH; SOMETHING NEW IN CLASSIFICATION by Barbara Kyle, will be available from SLA Headquarters, 31 East 10 St., New York 3, New York, as long as the supply lasts.

New Look In

MANUAL METHODS

ROBERT W. GIBSON, JR.
Assistant Chief, Technical Information Division

THE REASON for the existence of a technical information center is to aid the user and to supply him with information and data which he requires. Although it was formerly possible for a man to keep abreast of his field, it is now almost impossible for him to subscribe to all the journals in his own field, let alone scan them regularly. Yet the need for a method of literature handling that would enable the user to cover a given subject area is obvious when we realize that the amount of printed information is continuing to expand at an exponential rate.

Various techniques have been developed to serve man's needs in this field. The ASM-SLA Indexing System and the Uniterm Coordinate Indexing System are examples of these. Both of these are well devised, workable systems for meeting particular problems of indexing and classifying literature.

IMPORTANT CONSIDERATIONS

In the early work at Battelle, the underlying philosophies of indexing and classifying methods were closely examined. It was discovered that often sufficient consideration had not been given to the *user* of a system. In too many instances the thinking was along such lines as "Where would I file this?" rather than "Where would the user look for this?" Once the error in this manner of thinking was realized, the conclusion was reached that technical information could best be organized through close cooperation between the personnel operating the file and the personnel using the file. They must form a team with each having confidence in, and depending upon, the other. Several years of experience have shown that such a cooperative arrangement is a sound basis for information management.

One of the greatest dangers of any abstracting or coding scheme is that the thinking of the author of a book, paper, or report may be colored or contaminated by that of the abstracter or coder. It is important that the original concepts expressed by the author be retained; they should not be narrowed, broadened, or slanted in any way.

It must be recognized that no two men ever see a given situation in the same way. But rather than deploring this lack of uniformity among men, as one would if two supposedly identical machines failed to produce identical items, advantage can be taken of it! The application of several different backgrounds to a problem often produces a better solution than could be arrived at by a narrow approach. Ideas are like people; each is unique in its own way and, like people, each idea has points of similarity with other ideas. The similarities are so important that they must be recognized; the dif-

The authors, both of Battelle Memorial Institute, Columbus, Ohio, wish to acknowledge the work of Dr. Iver Igelsrud, Chief of the Technical Information Division, John Murdock, and Gustavus Simpson, who were among the earliest contributors to the design of the methods described.

BEN-AMI LIPETZ

Head, Titanium Information Center

ferences are so crucial that they cannot be ignored. This leads to one important point in the technique described here: grouping material so that the varied, but related, techniques or applications or properties will be scanned at the same time, often leads to new and important understandings and concepts.

Successful research is most often found where there is a free flow of ideas. In order to get the maximum results from scientific research, it is necessary to avoid erecting false barriers to that research. Freedom of inquiry must be maintained in *all* directions. Thus it is logical that the same flexible approach should be paramount in devising an information system.

Since 1950 various methods of handling literature have been investigated in order to find one that would approach inclusion of complete technical data and yet remain flexible, keeping in mind those ever present factors, economy and efficiency.

Goals in Developing a System

While testing and evaluating techniques commonly used for literature collection and analysis, three basic goals were kept in mind. These were:

1. Complete information desired by the user should be available.

2. Processed information should be available with minimum expenditure of time (for the user as well as the provider), minimum expense, and maximum reliability.

3. The method should be flexible enough so that it can be adapted to particular needs at any particular time.

Unfortunately for the designer of an information collection for use by a research organization, it is impossible to know at any time exactly what information will be required in the future. The three goals described above are the ideals: they can be approached but usually never achieved. For example, the only way to fulfill the first goal is to have all existing technical information that has been written. This is an obvious impossibility and, from a practical standpoint, not always desirable. It would result in unnecessary duplication of information and the inclusion of extraneous material. The goal may be redefined as the inclusion of pertinent and original data and information.

The second goal, economy, is jeopardized in the long run if a file is built and maintained that contains huge amounts of information which are virtually never required. The third goal of flexibility has been approached very closely by using key word cataloging.

As none of these goals can ever be achieved completely there must be a compromise. The information method developed at Battelle is the result of

an attempt to find a better-than-usual compromise from the viewpoint of the research engineer and scientist. No attempt is made to provide *all* technical data at once. Instead the method is designed so that it can be expanded or contracted as required in the light of current research projects, in order to help maintain peak effectiveness. The information in the system is stored in such a way that it can usually be recalled with remarkably little effort and time.

It became quite evident during preliminary investigations that the old-fashioned manual systems had not previously been thoroughly evaluated and that these techniques, thought to be outdated, seemed not to have been fully exploited in the past. It was concluded that the time had come for re-evaluating manual systems or combinations of manual-machine methods before proceeding exclusively to the evaluation and development of machine systems.

Perhaps the best way to illustrate the application of this thinking is to describe how it has been used effectively at the Titanium Information Center, which was established as part of a large titanium metallurgical laboratory at Battelle early in 1955 by the Department of Defense. The objectives of this Information Center are threefold:

1. To collect and have available all useful information on titanium metallurgy.

2. To provide information as requested to industrial organizations or individuals with specific titanium problems.

3. To provide information for the preparation at Battelle of summary reports on various long-range problems in titanium utilization which will help to vide a basis of titanium policy decisions in the Department of Defense.

Extracts

The first departure from customary practice is that the information materials most conveniently available to the user are neither bound books nor serials, as on library shelves, nor bare references nor abstracts, as in catalogs and abstract journals. Instead, information is on 5 by 8 inch cards which contain condensations, or extracts, of books and serials. These extracts are of no set length; they may cover one card or ten cards or even more.

As stated earlier, it is of the utmost importance that the original context and thinking of the author be available to those using the information. Unless the total picture of a book, article, journal, or report is placed in the file, much of its value will be lost. Thus we made the important decision to *extract* rather than abstract. By using extracts, the searcher need not read several entire articles to find that bit of information for which he is searching.

The extracts have been designed to provide the essence of the technical contribution contained in an original document. Historical background, restatements, summaries of the published work of other researchers, idle verbiage —all of these are eliminated in the process of condensing, leaving only original hypotheses, data, and results.

Preparation of Extracts

Let us now look at the manner in which items—letters, journals, articles, or reports—are handled by the staff of the Titanium Information Center. When a piece of information related to the broad field of titanium is received, it is immediately screened for pertinence to the project and assigned to the proper engineer for evaluation. Because it was Battelle's technical staff that was to make the most use of these files, the best way to insure meeting their needs was to have them work directly with the information specialists in developing the files. This is a radical departure from other systems for, in a very definte sense, the engineers who use the

information also constitute a part of the staff which puts information into the Center. This teamwork approach is the only assurance that information will be filed in the places where the users will look. The engineers and scientists appreciate this fact and nearly always cooperate in a fine manner.

A newly acquired item is given to an engineer who has specialized in the principal technical field covered by the article. He thus has the opportunity to use the data at once on current problems and to make notes for his private use. He may also indicate portions of the article that seem most significant before he passes the item to his teammate, the information specialist.

The information specialists, or analysts, who have been working closely with the engineers, have been made aware of the broad aspects and requirements of the project. They prepare the extract, making the fullest use of notations made by the engineer. Pertinent statements are bracketed in the text. There is no need to determine whether the extract concerns itself more with one subject than with another. No attempt is made to interpret the author's words. The original content of the author's statements is retained as completely as possible. This permits the user of the extract to make his own interpretation and evaluation. *All key words are underlined.* This process of underlining key words is most important, for it forms the basis for filing and for cataloging later in the procedure.

When the extracting and related work have been completed, the material is sent to typists, who retype the bracketed passages including the reference and underlined key words, names, organizations and contract numbers on Multilith masters. The number of copies to be reproduced is determined by counting the number of underlinings in the reference and extract (see sample).

After the masters are reproduced, copies are returned to the typists. In cases where more than one card is involved in an entry, complete sets are assembled. Conventional procedures would dictate that the file guide be typed at the top of the cards, but this is both time-consuming and costly. It is much more economical to underline in red one of the key words which has been underlined in the original typing. Each card or set of cards referring to a single document will have a different key word underlined in red. If the entry contains more than one card, the one containing the red underlined word will be placed at the front of the set, the remaining cards will follow in sequence. The cards or sets of cards are then ready to be filed by the red underlined key word appearing on the front.

Filing of Extracts

As everyone who has ever used a research library knows, having the desired information in storage is small comfort without a convenient method for finding it when needed. In developing Battelle's information method, this problem has been taken very seriously, and every effort has been made to minimize the time an engineer or scientist must spend locating pertinent data. This system eliminates the usual steps of cross referencing and going from a catalog to the information itself and permits the user to locate the information in a single step. He is able to find the proper entry and pertinent information simultaneously. There is no chasing from a reference list to a shelf and no need to scan and scour long reports again in duplication of the work of the extractor.

Copies of an extract may appear a number of times in the system. In the Titanium Information Center materials have been combined so that data may be located in at least six different ways.

L. R. Jackson and S. A. Gordon

The Application of a New Structural Index to Compare Titanium Alloys with other Materials in Airframe Structures

TML Report No. 24, December 1, 1955, to Office of the Assistant Secretary of Defense for Research and Development, Titanium Metallurgical Laboratory, Battelle Memorial Institute

. . .

A new method of predicting the failing load of a section in compression was suggested in 1954 by R. A. Needham . . . . this new structural index,

$$Se = \frac{2.56\, F_{cc}^{2.81}}{(F_{cy}E)^{0.59}},$$

is compared with the results of compression tests on aluminum sections at room temperature, and similar tests on titanium-alloy angles and channels at room and elevated temperatures . . . .

. . .

In Figure 1, . . . comparing all materials at roughly the same testing speed and for exposure to temperature for roughly the same length of time (approximately 30 minutes). These procedures make the comparison in Figure 1 reasonably valid; . . .

. . .

Table I summarizes the pertinent test information from the data obtained by Convair (San Diego) and Tables 2 and 3 summarize the data from Boeing (Seattle).

. . .

Card 1/2

10808

Sample extract cards for a Battelle report showing key word underlining.

Figure 4 shows the results on RC-130A, MST-3A1-5Cr and RC-130B channels obtained by Convair. The yield strengths and compression stress-strain curves on the different test pieces varied slightly. The structural-index curve shown in Figure 4 was for $F_{cy} = 140{,}000$. The change in shape in going from $E_r = E_{sec}$ to $E_r = \sqrt{E \tan E}$ is shown as is also the "cutoff" at F_{cy}. It will be noted that all points for which the structural index has a practical meaning fall either on the E_{sec} curve or near F_{cy}. Considering the slight variation in stress-strain curves and the fact that both sharp and rounded channels are represented, the agreement with prediction is good.

Figure 5 shows the data on channels made from RC-70, again the curve for $E_r = E_{sec}$ provides reasonable agreement.

Figure 6 shows the data on channels made from RC-55. Here there are three points that lie above the curve. However, this might not be unexpected. The RC-55 material is relatively soft and easily work hardened, the channel sections were short and relatively thick. It would take less than 1 per cent cold work to raise the compression yield strength of the RC-55 alloy to 70,000 psi, which would account for the three high points . . .

. . .

For figures and tables see L. R. Jackson.

Card 2/2

10808

References are filed as follows:

1. Alphabetically by author
2. Grouping by subject matter (also called key word file)
3. Alphabetically by organization
4. Numerically by government contract number
5. Alphabetical index to the subject groupings
6. Serial list of accessions.

The last two files do not contain extracts of information. The first serves as a guide to a new user who has not aided in the building of the file. The second provides a convenient way of locating original documents if necessary.

An extract may appear in as many files and as many times in each of these files as the extract itself warrants. This is essentially the same as the number of underlinings in the entry. For example, if the extract is of an Air Force contract report by two authors from one company and has information on three different subjects, it will appear once in the contract file, twice in the author file, once in the organization file, and three times in the subject file. All of the files are very straightforward and easy to maintain.

The subject or key word file is based upon underlined key words and thus requires the establishment of rules to guide its organization. Three basic considerations must underlie these rules: (1) the current purpose of the file, (2) utmost flexibility to meet changes in future objectives or purposes and, most important, (3) the manner in which users may approach the file. In the Titanium Information Center entries with key words relating to applications of titanium are grouped together, as are those relating to titanium alloy systems, processing of titanium, and properties of titanium. The choice of these major groupings in the subject file reflects the major interests of the users of the data. Successful files have been operated at Battelle, however, in which no predetermined groupings of subjects were utilized.

No attempt is made to predetermine key words other than the very broad classifications mentioned above. From this point on, however, flexibility reigns, and the proper amount of detail in the selection of key words is determined largely by the material itself. By observing the growth and use patterns of the literature, the information specialists, with the aid of the engineers, discover the kind of breakdown pattern that will afford the most convenient access to stored information.

While most subject catalogs quickly become outdated and require expensive revision, subject groupings in the key word file can always be kept up to date inexpensively by the simple expedient of shifting the positions of extracts on the basis of the filed word without having to reread and reinterpret the extracts. The physical location of a given term in the file is determined largely by file users, with the reservation that whenever a certain word appears in an extract (unless it is a homonym) it shall always be filed in one place.

Using the System

With several ways of locating information in the Information Center, the choice depends upon the particular problem of the user. If an engineer needs to know something about, say, furnaces or tensile properties, he has only to go to the key word file and find under those headings a complete collection of extracts, all dealing in some way with the topic he has in mind. It is obvious that filing the entire extract under each of the underlined words has made cross referencing completely unnecessary. When, for example, the cards on "furnaces" have been pulled, the searcher not only will see the relation to furnaces of the cards under this heading, but also will notice relations among all of the other concepts that have been underlined on these

same cards. He may have a great many new thoughts brought to his mind which can be checked further in the file by shifting his interest to sections suggested by other underlined concepts.

Although this key word approach to the file usually yields much pertinent information, there is no guarantee that it will yield *all* the pertinent information contained in the Center. There is usually additional information pertaining to a certain problem which would not be found under the words used to state the problem. For example, information may exist that is related to ductility of titanium but that never used the word "ductility." To find such information, there are two distinct choices for further searching after the initial direct approach, i.e., "ductility."

One path for further searching is to continue in the key word file and to investigate, one after another, all key words that are related to ductility. The other path is through the author, organization, and contract files. Very definite clues are provided by the authors, organizations, and contract numbers appearing on the "ductility" cards. By referring to other extracts that pertain to these authors, organizations, and contract numbers in their respective files, it is almost inevitable that additional pertinent information will appear as well as additional subject words. By working back and forth between the key word file and the other files, virtually every bit of pertinent data existent in the Center is soon discovered. How long to apply this technique—or whether to apply it at all—depends upon the nature and urgency of the problem under investigation.

In most cases the user needs no introduction to the Center since he has had a hand in building it. He thus has confidence that he can obtain from the file all of the important data concerning his subject. If he is a user from another company, a trained information specialist is on hand to offer aid. In most cases a staff member can do his literature research directly from the extracts contained in the file. If, after studying the extract, he feels he needs to see the original document, he has the advantage of knowing before he goes to the original that it contains the material for which he is searching. This file is not a "clue-finding" file as is the normal library catalog or abstract journal. Rather it is a "fact-finding" file containing actual information stated in the same context as in the original.

Flexibility and Advantages

At the Titanium Information Center some twenty or so abstract journals are scanned every month for abstracts that mention titanium in any way. All of these abstracts find their way into the author file, but only a portion are considered closely enough related to the present scope of the Information Center to find their way into the key word file. In cases where they are considered pertinent, the original material is obtained and extracted.

As a particular section of the key word file grows large and unwieldy, e.g. "ductility" or "furnaces", it has always proved possible to break it down according to the sense in which extracts treat the subjects, so it is rarely necessary to look through all extracts on that subject unless one is conducting a general review. The technical users of the system usually recommend such breakdowns and are instrumental in making decisions on the categories.

Another feature is the ease with which the information content (as distinct from arrangement) may be varied to meet new research requirements. When there is an expansion or change of the objectives of such an information file, it is usually possible to find without trouble a small number of references that pertain to the new subject. These are extracted carefully and the authors and contributors, as well as the authors mentioned in the bibli-

ographies at the ends of the items, are noted. By consulting these authors and contributors in the author file, it is usually possible to find a large proportion of the existing references on that subject in the form of abstracts and references which were previously considered unsuitable for the key word file. These references are quickly supplanted by extracts that are filed in a normal way throughout the system.

Sometimes this process is reversed. Information that is in the key word file but on further consideration is thought to be useless is eliminated from that file but allowed to remain in the author file so it can be found again if requirements should change.

One of the anticipated difficulties with this type of information system, and one which did not materialize, was the factor of physical size. Contrary to expectation, this system becomes easier to use as it grows because it yields more positive data on most problems; hence referring from one file to the others as from the key word file to the author file and back again, is required less frequently.

An unexpected result of the use of underlining to indicate the file positions for a particular extract has been that it makes scanning of extracts extremely rapid. As one looks at a printed extract, the underlined words, which are the important words, stand out predominately, and it requires only an instant to decide whether the extract is worth reading more carefully. At the same time the underlined words stimulate creative thought processes which often lead to better approaches to the problem at hand and which indirectly stimulate work in other fields by supplying new associations of ideas.

Another advantage of this information method is its accessibility. The card files are housed in cabinets and as the system grows, they can be used by many people simultaneously.

General Remarks

The search for a broader philosophy of information management has resulted in a processing method that is at once flexible and efficient and a storage system whose literature has been systematically analyzed and organized by the people who will be using it most frequently. The variations found in literature and also human variables have been taken into account.

The essential features are the use of extracts of variable lengths, multiple filing of extracts, use of multiple files (i.e., authors, organizations, contract numbers, accession numbers), and avoidance of a separate cataloging system.

In the final analysis, the method is a unique one because it recognizes the concept of teamwork in a field where it has been lacking heretofore. A group of clerks, information specialists, and engineers has been developed into a well-coordinated team which makes certain that new information is integrated into the file and ensures economical and efficient retrieval of information and data upon demand.

The information system that was designed to fulfill the needs of the project discussed here is not necessarily the one that would be required for another problem. However, it is flexible and this quality of flexibility makes the system or parts of it attractive for handling recorded technical information as it is found in any organization or working group. While the system seems to have great simplicity, it would not be wise to proceed in building a similar system without benefit of aid and consultation; there can be pitfalls for the unwary. While the techniques described are based on new uses of manual methods, possibilities of utilizing various mechanized systems are also being investigated. A combination of manual and mechanical methods may add new potential to this concept of information handling.

Use of the ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION SYSTEM By Industrial Metallurgists

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INITIALLY the *ASM-SLA Metallurgical Literature Classification* was designed to serve a three-fold purpose:

1. To provide a logical and practical breakdown of the entire field of metallurgy having universal application in classifying and indexing the literature.

2. To serve as a guide for punched card systems that can be used by metallurgists or librarians for data collections.

3. To be used as a pattern for classifying and coding abstracts published in *ASM Review of Metal Literature.*

The author's experiences and description of the system will be confined mainly to purpose two above; that is, the use of the system by industrial metallurgists and its insertion into present filing systems.

DATA FILING SYSTEMS

At Barber-Colman the following compact systems for having data readily available are used:

A. A manufacturers or catalog file which contains all letterhead correspondence from vendors and their equipment brochures. This is kept up to date in the usual manner of business files.

B. A small departmental operations or administrative file which contains material that needs to be readily available and in a somewhat chronological order. This includes administrative instructions, safety reports, departmental expense reports, heat analyses, personnel records, etc.

C. A parts file. These are filed in general under product but in detail by company part name and company part number. This file contains the historical and metallurgical practice information so often needed in "trouble shooting" parts in an industrial plant.

D. A technical file based on the ASM-SLA system. This file contains the following information: tear sheets of technical articles from magazines; internal metallurgical reports, particularly investigations; patent descriptions; internal laboratory testing techniques; metal and alloy technical data as published by various vendors in the materials section; and *Transactions of the American Metals Society.* This so-called decentralization of the files has been a distinct aid because it maintains the purity of the ASM-SLA file as a "technical file."

The basic framework of this file has proved to be quite workable. Since the official ASM-SLA code index is only provided through the third order and in some cases only two orders are provided, the system is quite elastic for the user who has special interest in a certain category and may wish to expand its particular section to a detailed index of his own choosing.

PRECODING DATA

By recent committee action all ASM publications will be precoded before

At the time Mr. Wallace presented this paper he was a metallurgist at the Barber-Colman Company, Rockford, Illinois.

publication. This way recipients will have the code intact with each article for easy transference to punched card. Thus, it is now not necessary to attempt to connect received tear sheets with the original coding of *Metals Review*. Of course, this is only for ASM publications at present. For all other publications it is necessary to refer to the code. It is hoped that other metal trades magazines and periodicals may adopt precoding in the future.

A fairly simple way to precode articles, however, is to employ the following procedure:

1. Check or circle articles desired in *Metals Review*.

2. Stenographer types letters of request. Coding is put on bottom of file copy of the letter of request.

3. When article is received the letter of request is connected with it, and coding is then transferred to the received tear sheet.

4. Tear sheet is given to the metallurgical staff member, who is most interested, for abstracting.

5. Stenographer copies abstract onto punch card and punches coding.

6. Lab director reads abstract and returns card for filing.

Metals Review does not code into the common variables section nor does it code by the third order in the process and properties index, although some third orders are provided in the official indexes. At Barber-Colman this was not found to be a handicap because it provided greater flexibility and choice for third and fourth orders. An unflexible system coded down through all four orders could not be adapted in all industrial plants due to variation in interest. For the same reasons the original committee setting up the system did not resort to a decimal because it was felt that the natural subdivision of metallurgy did not divide easily in all subjects into multiples of ten.

Coding Uncoded Material

We have adopted an approach toward coding uncoded material that is based merely upon an outline or importance logic. It has worked fairly successfully but naturally works most successfully if clerical personnel have technical backgrounds or at least technical aptitudes. It seems any coding system in a technical field must demand at least this much. Of course, a more standardized set of terms is desirable when nontechnical personnel are used.

To explain further our technique of coding, we employ an "outline" or "importance" technique. For example, the title "A Time-Temperature Relationship for Recrystallization and Grain Growth" might be outlined as follows:

1. Grain growth (recrystallization)
   - A. Effect of time
   - B. Effect of temperature
   - C. Relationship of time and temperature

Our reasoning for placing the importance upon grain growth and recrystallization is that it is the end result and what we are interested in. The time and temperature are secondary and only a means to obtain the final grain growth. We would, therefore, code this article under N3 and N5 in the process and properties indexes. Common variables codings would be applied under 2-11 and 3-17 which complete the coding but, we feel, give the main importance to the terms grain growth and recrystallization under N3 and N5.

No materials would be coded for this article because there were seven different alloys investigated, both ferrous and nonferrous. This would complicate the punching since it becomes highly undesirable to punch more than two or three holes in any one section.

A second example is the title "Nitriding of Titanium with Ammonia." This is outlined:

1. Titanium
   - A. Nitriding of Titanium
     1. With Ammonia

It is coded thus: Under process and properties we find nitriding under the heat treatment section which is J-28k. Under the materials section we code titanium as Ti-2, which is pure or unalloyed titanium. We use 8-18, which is hard surfacing, under common variables because it is a very specific category for this section. We avoid the more generalized codings in this section, such as time, temperature, prior history, etc.

A word of warning should be mentioned concerning the common variables index. This can be overly used to the extent where it no longer becomes meaningful. For instance, so many metallurgical processes are dependent upon time and temperature that unless we endeavor to apply, where possible, more independent or specialized listing for a title in this section, this section will not be the aid it is intended to be because too many cards will fall out.

Concerning our own internal reports we have coded them into our ASM-SLA file where they were of an investigatory or general nature and did not pertain to a specific part number manufactured by us. All sections are punched, even an author, and the departmental personnel assume a sense of pride on selecting reports under their own authorship. This is more important than might be believed.

ASM-SLA Classification Changes

The ASM-SLA Classification System is a dynamic thing. The current committee is considering improvements and additions to better serve users' needs. Already the following changes and improvements are forthcoming. These are based upon about five years experience with the system and careful consideration for the majority interest:

1. Additional elements to the common elements section because of their rising industrial importance. These are: boron, beryllium, columbium, tantalum, titanium, uranium, vanadium, zirconium.
2. Section V is to be eliminated and incorporated into Section A, general metallurgical.
3. Section of process and properties will have nuclear energy added as a first order.
4. Work is being done to take care of compounds and non-metallics.
5. Miscellaneous problems involving changing of sections and coding.

Any contemplated changes in the basic framework of the code should be referred to: Mrs. Marjorie Hyslop, Secretary, Committee on Metallurgical Literature Classification, American Society for Metals, 7301 Euclid Avenue, Cleveland, Ohio. In this way obstacles which might be encountered later if the changes should be contrary to current or possible later committee action can be avoided, costly, time-consuming backtracking can be prevented, and the system can be kept intact for all users.

Summary

I have discussed some of Barber-Colman's experiences and opinions relative to the use of the ASM-SLA file by industrial metallurgists and I feel it will work for others if they will use it as a technical file. It will not disturb catalog, parts, or operational files as we feel one should have these as compact units which do not allow the ASM-SLA file to become a catch-all for myriad subjects.

The author believes the ASM-SLA system can be easily inserted into present systems of files and that the sooner industries adopt methods based on a common system of searching technical files, the easier the task will become.

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Use of the UNITERM COORDINATE INDEXING SYSTEM In a Large Industrial Concern

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OUR CURRENT technical age is producing information in rapidly increasing volume, and in so doing the individual company is acquiring tremendous pools of knowledge and skills. That this information is of vital importance to progress is unquestionable and many have struggled for its control. However, the struggle must continue if we are to obtain the ability of absorbing and applying this information. We must then have adequate means of organizing and controlling the information for its intended use. It does not matter whether the information has been searched and processed by high-speed machines or by catalogs and filing systems. A high level of organization and control is necessary and of paramount importance.

PROBLEMS OF CONTROLLING INFORMATION

The standard library classification systems with which we are familiar today had their inception in the early nineteenth century and were based upon open-shelf operations. Today with the overwhelming pool of knowledge being documented in report fashion, these systems are no longer adequate. Dean Jesse Shera, Western Reserve University School of Library Science, expressed it this way:

"Today, under the impact of a rapidly growing volume of graphic records and the appearance of new forms of publication, traditional library classifications are becoming hopelessly inadequate. No amount of basic revision or tampering with the organic structure can save them from this failure. As guides to the subject content of the library they are essentially meaningless. Even librarians, who are best qualified to interpret them and to exploit their virtues, use the notation only as a guide to location and largely ignore the interdisciplinary relationships that they are designed to reveal."*

All of this, of course, led to attempts to find better ways of handling this enormous pool of information. Some attempted new cataloging systems, others attempted to use fast random excess machines. When those using catalog systems found they were too slow and awkward, they tried to mechanize. When those who had tried machines found they had so many items that random searching wasn't practical, they tried to catalog their cards, thus paying the penalties of increasing their total number of cards as well as having to maintain their order. To sum up the situation, classification systems and machines began going around in circles.

COORDINATE INDEXING SYSTEMS

All of this work, however, resulted in many developments that were successful within particular limits. One of these is the Uniterm System developed by Mortimer Taube and Associates of Documentation, Inc., Washington, D.C. The Uniterm System is a coordinate indexing system based upon objective cataloging in which objectivity is achieved through the combining of words to

* "Classification as the Basis of Bibliographic Organization", *Bibliographic Organization, Papers Presented before the Fifteenth Annual Conference of the Graduate Library School, July 24-29, 1950,* edited by Jesse H. Shera and Margaret E. Egan. Chicago: University of Chicago Press, 1951, p. 72.

form an intersection or coordination. Mr. Baton of England came up with this solution, using a dedicated position, for libraries of a limited size many years ago. Today the system is known by many names but is most often spoken of as the "peek-a-boo" system. The Uniterm System eliminates the dedicated position arrangement by using an arithmetic rather than a geometric order.

Coordinate indexing is based on words. Language is based upon words. Many ideas and concepts are expressed in language as combinations of words. Although the number of such combinations may be large in any particular body of information, the number of individual vocabulary terms used is often surprisingly small. To illustrate this, I can cite our own experience in the General Electric Company Technical Data Center where the Uniterm System is now being used for cataloging.

Cataloging Based on Words

Over 150,000 reports have been entered in the Technical Data Center, and yet out of all of the subject headings used to catalog these documents in a conventional subject catalog only about 3,000 different words were used. In the Uniterm System the information contained in a document is broken down into the simplest practical storage units, just as in the Baton System. Each document is assigned a serial number, and the number is posted on all cards headed by the terms into which the document has been separated.

As an example, consider a report dealing with gas turbines. The words themselves might be associated with a number of different ideas in such phrases as gas pipes, steam turbines, etc. However, the logical combination of these two terms gives the intersection of information known as "gas turbines." If we were to be more specific and deal with information on gas turbine buckets, we would find a still smaller section denoted by this coordination. The same logical combination is obtained regardless of the terms. The three separate terms "gas," "turbine," and "buckets," when coordinated are equivalent to the six possible ways by which this information can be represented in conventional indexing systems (Fig. 1). In the Uniterm System the same coordination is achieved by searching the document numbers on the three Uniterm cards involved.

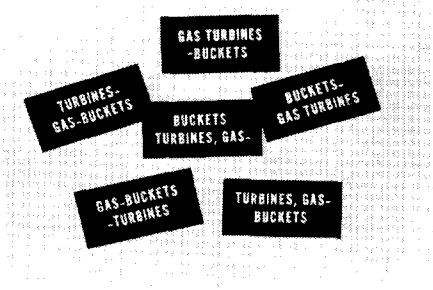

Figure 1—Possible subject headings in conventional indexing systems.

If there are four or five subjects within this particular report the number of combinations will rise rapidly. In the case of five words, such as vibration damping of gas turbine buckets, there are 120 ways in which they may be combined. However, in standard cataloging practice it is unusual to use more than three or four of these combinations. This means the searcher may possibly have four out of 120 chances of retrieving the information on his first trial. With the Uniterm System all 120 entries to the information are in his hands when he holds the five terms. We are currently averaging between fifteen to twenty terms for each technical report in the Technical Data Center. This gives some idea of the possible information entries which are gained through the use of the coordinate system.

Whereas the standard cataloging techniques add a card to the subject file for each combination of words chosen, the

Uniterm System merely adds a number to an existing card or to several existing cards. The size of the system thus becomes a function of the number of vocabulary terms rather than of the number of expressions of ideas generated by the combination of terms. The card catalog is usually reduced in size about ninety per cent. The basic vcobulary for a particular field of engineering usually becomes asymptotic in the vicinity of 3,000 terms. In the case of several fields of engineering, but not including organic chemistry, the limit would be closer to 7,000 terms. When organic chemistry is included the terms will vary somewhere in the neighborhood of 12,000 to 15,000 terms.

The operational benefits derived are threefold: (1) the indexer is freed from the time-consuming task of making subjective decisions concerning word order; (2) the poster who transfers numbers from Uniterm cards gains a simple task compared to the corresponding work of preparing and filing catalog cards for each assignment in a conventional system; and (3) the searcher profits because he can approach the coordinate index from any point of view, being as specific or general as he wishes.

Another saving is obtained in filing the actual documents in ascending order with an arbitrary accession number, thus eliminating the expansion factor normally included at the back of each filing drawer. This may at times amount to a saving of well over twenty-five per cent of the filing space.

Uniterm Search Procedures

As noted before, the word turbine can be associated with a number of different ideas in such phrases as turbine generators, turbine speeds, gas turbines, turbine buckets, etc. There are two ideas or terms in the phrase turbine buckets. One, the class of turbine ideas; the other, the class of bucket ideas. When the two terms are used together, what is known as the logical product is obtained. This means that which is turbines and buckets, and it is obvious that the same concept is expressed by buckets and turbines. The order of terms is immaterial since the same total body of information is represented by either arrangement. The overlapping or common area of turbines and buckets represents a smaller body of information than either of the individual areas. It is, therefore, easy to see that a more specific area can be obtained by using a larger number of terms, which narrows the field of search.

Since the same logical representation is obtained regardless of the order of terms, three separate terms — turbine, buckets, and gas — when coordinated are equivalent to the six possible ways by which this information can be represented in any conventional indexing system.

There is no reason to assume that turbine is any more important than buckets or vibration and, consequently, no reason to subordinate any one term to any other term. To do so would hide important information if the system were approached from a point of view other than that taken in the initial arrangement. It is possible, of course, in a conventional system to establish cross-reference structures to avoid this, but as the body of information grows and the number of access points desired increases, the structure becomes unwieldy. The Uniterm System eliminates the need for conventional cross-references. Every element of information or data is an access point to the total information required.

For manual manipulation of the Uniterm System in the Technical Data Center we have designed our own ten column card. As in all other Uniterm cards the space at the top is for the designated "Uniterm." The columnar arrangement is designed to break up the mass of numbers on the cards by posting all numbers ending in one in the

one column, all numbers ending in two in the two column, and so on.

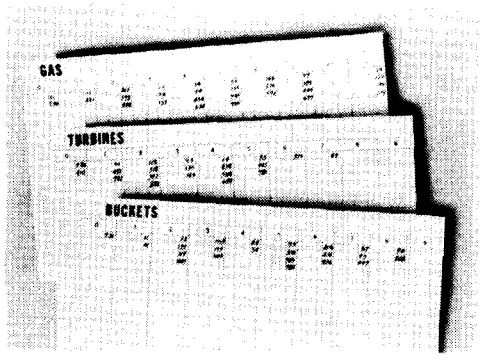

Figure 2—Uniterm cards with entry numbers listed in ten columns.

Figure 2 demonstrates the way "Uniterms" provide reference to wanted information. There are twenty-four items containing information on buckets, twenty-nine on gas, and twenty-one on turbines. The arrangement of the numbers in ascending order by final digits makes it easy to determine that item numbers 230, 11, 882, 34, 785, 216, and 447 pertain to "gas turbines." The search is thus narrowed to seven items. By comparing these seven numbers with the numbers on the buckets card it is seen that only four items, numbers 230, 882, 785, and 216 contain information on "gas turbine buckets."

It may be noted that the time of search is determined by the smallest group of numbers to be compared. If the turbine card had 300 or 400 entries, the gas card 50 entries, and the bucket card only 24 entries, it would shorten the search time considerably to compare the bucket and gas cards and then to examine the turbine card for items found during their coordination.

Cataloging Process

The use of the Uniterm Coordinate Indexing System in the Technical Data Center begins with the receipt of company reports. These reports normally have a front page containing, among other things, a title, an abstract, and conclusions. These are, of course, a big help in gathering together appropriate Uniterms to completely describe all subjects contained in each report. However, we do not rely on this and scan the complete report to be sure that the writing of the abstract and conclusions has been well done. All terms are written on a slip of paper that is stamped with the Uniterm number assigned to the report. At the same time the Uniterm number of the report is added to our log book. This number contains a great deal of information. "R." or "D.F." signifies a report or data folder that is a formal or informal presentation of information. The first two digits give the year of issuance, the letters indicate the originating department, and the last digits indicate the particular report issued in an ascending sequence starting with number 1.

By far the large majority of our business is furnishing reports ordered this particular number. We prefer to file them by this number and we do. Therefore, when we have made a Uniterm search for information on a particular subject and have in our hands a list of Uniterm numbers, we are not able to retrieve the reports by the Uniterm number, but must first convert the number to our company system. This is where the log book enters the picture. Because Uniterm numbers are given out in ascending order, it is a simple task to check their company designations. The log book is, of course, only one of many modifications that can be made in a coordinate index system to make it fit particular needs. In general the search for the Uniterm numbers takes us less than one minute and documents can be retrieved in less than three or four minutes.

Limitations and Possible Pitfalls

In general, the Uniterm System is limited in use to documents, reports, pictures, and the like which deal with

particular fields of interest. It is not adaptable to normal open-shelf operations. For instance, the *Handbook of Chemistry and Physics* would have to have Uniterm references for every page and perhaps every paragraph. This, of course, is not practical at this time.

Two of the pitfalls normally encountered which can make or break a system are synonyms and terms so general that they encompass an entire library. The presence of synonyms will tend to lose information or at least hide it from the searcher by storing it in two different terms. As an example, suppose information on high velocity projectiles was entered on one occasion under the terms high, velocity, and projectiles and on another occasion under high, speed, and projectiles. A searcher making only one of these coordinations would retrieve only a portion of the information but would be led to believe that he had acquired it all.

One solution to this problem is to insert "*See*" cards in place of synonyms. In other words the "speed" card would not contain numbers but would merely say "*See* velocity." While this will work, it has the disadvantage of adding additional cards to the file.

Another approach is to establish a dictionary of terms which is merely a list of all the terms appearing in the Uniterm Index typed in alphabetical order. This is an easy chore in that all terms in the Uniterm Index are maintained in alphabetical order, so a typist may merely run through the cards typing each term in alphabetical order on a master sheet. The dictionary of terms is a great help to both the searcher and the cataloger. In the case of the searcher, it enables him to scan quickly all terms in the system to find the terms which most appropriately apply to the information he is seeking. On the other hand, when the cataloger is about to make some new entries into the system, he is able to scan quickly the dictionary of terms to be sure that he does not introduce a new synonym that would tend to hide information.

The number of postings on each Uniterm card turns out to be a fairly adequate means of checking and indicating to the cataloger the presence of synonyms and terms that are too general for his particular collection. The distribution of postings on Uniterm cards follows a normal distribution

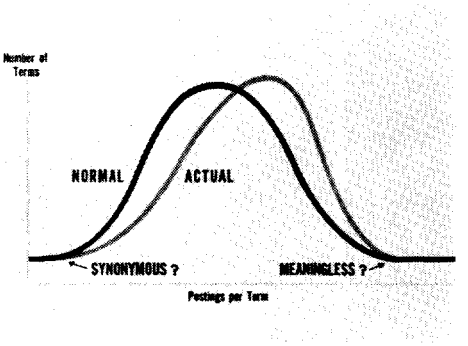

Figure 3—Average distribution of postings on a Uniterm card.

curve with a slight skew to the left (Fig. 3). Uniterm cards that contain only a few postings should be suspected of being synonyms and perhaps splitting information which has been entered elsewhere in the system. Cards that have a huge number of entries should be suspected of being terms of too general a nature and perhaps meaningless. Continual checking of these indicators is the only method I know of to eliminate these problems.

Use of Free and Bound Terms

When establishing the Uniterms to be posted on the top of each card, one is faced with the problem of establishing either free or bound terms. Say there is information on gas turbine buckets. The cataloger may establish this as gas, turbines, and buckets, and in this case each of the three terms would be free terms. However, suppose he establishes two terms, gas tur-

bines and buckets. The term gas turbine would be a bound term. If he never expects to have any information on any type of turbines other than gas turbines and never expects gas to appear with any other term but turbine, then he is perfectly justified in establishing the term "gas turbines."

At a future date, however, he might receive some information on gas pipes or steam turbines and at this time he would be faced with breaking up the term gas turbine. To do so would involve the typing of a new card and the transferring of the numbers from the gas turbine card to a new card. The new card may be called gas and the word gas may be crossed off the old gas turbine card. Everything may go on then as normal, with all new postings on the term gas going to the gas card and all new postings on turbines going to the turbine card.

If, on the other hand, the cataloger had begun with free terms, he would never have to transfer the numbers. It is true that he would have had two cards in his system during the period when he never had any information on anything other than gas turbines involving the terms gas and turbine. However, he faces a lesser chore if at a later date he decides he never will receive any information containing these two terms on anything except gas turbines. To combine the terms he merely types the term gas in front of the term turbine and throws away the gas card. My own personal preference has been to always establish free terms. In that the file is so limited in size because of its dependence on vocabulary, the few additional cards that are added by the use of free terms do not increase the size appreciably.

False Coordinations

One question that always arises in all discussions of coordinate indexing systems is that of false drops or false coordinations, and usually much is made of it. My experience thus far with the system, however, indicates that too much is made of it. For those who are not too familiar with false drops, let me illustrate. In using the coordinate system, one may be looking for the terms "fish" and "food" but does he want to retrieve information on food for fish or fish as food? The truth is he will retrieve both.

In using the system for technical information of an engineering and scientific nature, with approximately a year and a half to two years of experience at this time, we have never yet encountered the false drop. On the other hand, I have never been in a discussion of the coordinate indexing system during which this question was not raised and very much made of it. All I can say at this time is that my experience would indicate that it is not at all a serious matter, but rather one of theoretical aspects only. It does have one good side. False drops in the coordinate index system never leave out information of interest. The only thing that may happen is that one may obtain additional information which is not of interest, but this will not limit in any way the ability to retrieve all information of importance to a subject.

Versatility of Posted Numbers

Now that I have discussed briefly some of the aspects of the Uniterms themselves, I should like to call attention to the posted numbers and the versatility that may be gained in the system through the use of these numbers. Suppose a company classification of information has three classifications — 1, 2, and 3. If searchers would like to know the company classification of every document upon being given its Uniterm number, this may be done by saving particular columns of numbers for the reports of each classification.

All numbers ending in 1 may be assigned to Class 1 of a company classification and all numbers ending in 2 as Class 2 of a company classification and then, of course, all numbers ending in 3 as Class 3 classification. This will in no way interrupt or influence the retrieval of information from a system because all numbers are given out in ascending order and no new number ending in 1, 2, or 3 can appear unless it is of a particular classification.

Another method of identifying information, let us say the same information for the sake of an example, would be to attach a prefix such as a, b, and c. The prefixes need not have any particular reference to the retrieval of the information but merely indicate to the cataloger or others in search of the information exactly the type of information being retrieved.

The Technical Data Center of the General Electric Company has been using a modified Uniterm Coordinate Indexing System for the handling of its technical information for well over a year and a half, and the system is working well. I can personally recommend it for any technical system, particularly if not entirely chemistry, and especially when used by a limited staff.

In conclusion, I would urge all to remember that any classification system whatever is neither all good nor all bad. Accept each system upon the basis of its own merits and apply it within its own limitations.

COMING EVENTS

AMERICAN CHEMICAL SOCIETY, DIVISION OF CHEMICAL LITERATURE. The spring meeting of the Division of Chemical Literature will be held in Dallas, Texas, April 8 to 13, 1956. A series of four symposia on "The Literature of Combustion of Petroleum" will be presented jointly with the Division of Petroleum Chemistry. Other symposia will deal with "Patents" and "New Tools for the Resurrection of Knowledge." A number of SLA members will present papers at the five day meeting.

ARMED FORCES MEDICAL LIBRARY. A symposium on the "Acquisitions Policy of the National Medical Library" will take place on April 12, 1956, at the Armed Forces Medical Library, Washington, D.C. The symposium will start at 9:30 a.m. and continue through the day. Although intended primarily for members of the Armed Forces Medical Library Staff, other interested persons may attend by applying for admission cards to the Director, Armed Forces Medical Library, Washington, 25, D.C.

CATHOLIC LIBRARY ASSOCIATION ANNUAL CFNFERENCE. The thirty-first Annual Conference of the Catholic Library Association will be held in the Somerset Hotel, Boston, Massachusetts, from April 2 to 6, 1956. "Reading in the Home" will be the conference theme.

OHIO VALLEY REGIONAL GROUP OF CATALOGERS. The Annual Conference will be held in Berea, Kentucky, on April 27-28, 1956. The theme of the Conference, "Current Cataloging Trends in the Large and Small Libraries", will be interpreted through various workshops.

CHAPTER VISITS. SLA's president, Chester M. Lewis, will visit the following Chapters during his spring tour:

April 6	Michigan
April 9	Illinois
April 10	Minnesota
April 11 .	Heart of America
April 13 .	Greater St. Louis
April 14	Indiana

INDEXING SYSTEMS SUITABLE FOR TECHNICAL LITERATURE HANDLING: *A Bibliography*

The purpose of this list of references is to add to the "know-how" literature on technical libraries and technical and metallurgical literature handling. A more complete listing may be found in the *Bibliography on Filing, Classification and Indexing Systems for Engineering Offices and Libraries* published by the Engineering Societies Library in 1954 as *E.S.L. Bibliography No. 9.* It may be purchased from the Engineering Societies Library, 29 West 39 St., New York 18, for $2.00.

MRS. MIRIAM M. LANDUYT, *Compiler*
Catepillar Tractor Company, Peoria, Illinois

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A proposed "peek-a-boo" system is described with an experimental application. An appendix provides description of devices.

Pittsburgh's Changing LIBRARIES

MRS. MARGARET S. SULLIVAN
Chairman, Pittsburgh Chapter
Dravo Corporation, Neville Island, Pittsburgh, Penna.

PITTSBURGH is a city which one native industrialist says "developed from a diminutive, restless town to a position as one of the great industrial capitals of the world . . . to ascendancy in the field of medical education, treatment and research . . . to rapid development as an industrial research center . . ."

In this ascendancy and development, Pittsburgh's libraries have played a large part; consequently, in each new skyscraper and each new research laboratory the library is being given significant recognition as a focal unit of needed information. Some libraries are small in size with limited individual resources; others have enviable collections of books, periodicals, and the special materials representative of their organizations' requirements—but all of them, through the exceptional cooperative interchange of material between libraries afforded through membership in SLA, are large in service.

Convention visitors to Pittsburgh will find many changes in its libraries since the 1938 Convention. New libraries have been established; long-established libraries have taken on the "new look" of the buildings that house them. Three of Pittsburgh's new libraries are located in Gateway Center — the first impressive sight that greets visitors as they enter the city.

The first library in our tour of the three buildings which make up the main part of the Center is that of the Pittsburgh Plate Glass Company. It is understandable that a company which in 1883 constructed the first commercial plate glass factory in the United States would be library-minded. The reference library in Building No. 1 is only one of five maintained by the company. The Gateway Center library serves executives and personnel with general information, materials for business research, and provides a comprehensive reference service. Ably administered by Dorothy Hopkins, all library service is keyed to the specific requirements of the company. The collection, which consists of legal, technical, and chemical publications, is made up of approximately 7,200 books, 5,500 pamphlets and 90 current magazines. Important changes are being made in this library which should be completed by June; preliminary plans indicate it should be a "must" on Convention tour lists.

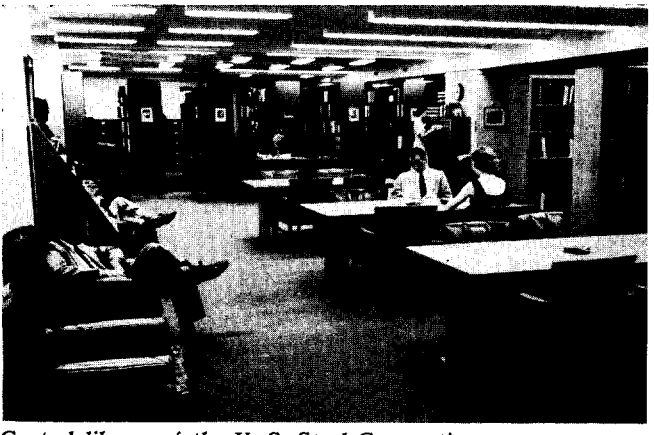
An interesting public utilities company library is that of the Peoples Natural Gas Company located in Building No. 2. Under the efficient direction of Lila Stein, this library was established in 1949 to concentrate in one place geological surveys, oil and gas publications, directories, maps, and other material needed in the work of the company. A particular feature of the library is the interesting exhibits held here from time to time. It contains approximately 1,100 books, five four-drawer vertical files of reports and informational data, and about 100 current periodicals.

Building No. 3 in Gateway Center houses the Jones & Laughlin reference library which is a part of its important market research division. The library deals for the most part with statistical information covering competitive industries, industries using steel, and sales and product information within the industry itself, and it

makes available promptly the statistical background data required by the market research department as well as others. The necessity of insuring that market studies are based upon current and completely up-to-date data means that material within the library need not be extensive, but it must be of a specific type and must include the latest information available. As a result reports and journals constitute the major part of the collection; the book collection is small. Mrs. Martha Jane Scribner is the librarian in charge. A complete and comprehensive book and periodical collection is maintained in J&L's functional and attractive technical library located in the new research laboratory in Pittsburgh's Southside.

From Gateway Center the tour proceeds up Fifth Avenue to Mellon Square Park which fronts the Convention Hotel and is surrounded on all sides by buildings containing some of Pittsburgh's best-known libraries. On one side is 525 William Penn Place, the sedate name given to the world-famous United States Steel-Mellon Building. There are several libraries in this building, the best-known being the central library of the United States Steel Corporation. It has been observed that although Pittsburghers look at their city through rose-colored glasses, they are steel-rimmed ones. Of this Pittsburghers are proud, and the central library reflects this pride. The 12,000 volumes, 500 subscriptions, and 115 file drawers include material on metallurgy, engineering, industrial relations, business administration, commerce, economics, and steel industry history. "As far as our subject field is concerned, I could belong to practically every division of SLA," says Elizabeth B. Fry, librarian, and the lucky librarians in the area who constantly call upon her resources agree. This library also services fourteen other libraries in plants and divisions of the corporation. The staff consists of two professional librarians and two clerical assistants. Any Convention visitor who observes its functional beauty, expert planning, and performance will

Lila Stein in her library at the Peoples Natural Gas Company.



Central library of the U. S. Steel Corporation.

Mrs. Martha Jane Scribner, reference librarian at Jones & Laughlin Steel Corporation

agree that "Only steel can do so many jobs so well."

On the fourth floor in the building is the library of The Mellon National Bank and Trust Company. The information center of one of the outstanding banks in the world, it carries out its important functions well. It serves management, employees and customers of the bank and its forty-eight branch offices. Most of the staff's time is spent answering reference questions which provide statistics for the economic office, background on industry for the investment research and industry divisions, information on various types of loans for the banking department, and all the usual requests that come to the active and frequently used library. The library includes over 4,500 books on business, finance, and economics; subscribes to some 200 periodicals of which 125 are circulated regularly to bank personnel; and maintains thirty-five drawers of files on subjects relating to industry and banking. The library boasts the most complete collection of the *Wall Street Journal* in the City of Pittsburgh; its bound copies of the *Commercial and Financial Chronicle* date back to 1879. Laura Marquis, well-known to SLA'ers, is librarian.

Within a stone's throw of Mellon Square is the library of another famous banking institution, the Pittsburgh Branch, Federal Reserve Bank of Cleveland. This library was established in 1943 to serve member banks, officers and staff, and Pittsburgh business organizations. Under the capable direction of Mrs. Phyllis Funk, it has enjoyed a steady growth both in use and in acquisitions. An important facet of library assistance is that offered to students of banking in the American Institute of Banking educational program and various graduate schools of banking.

There are enough libraries in the shadow of Mellon Square to occupy the visiting time of all SLA guests: The Aluminum Company of America in the ALCOA Building; Ketchum, MacLeod and Grove, Inc. in the Chamber of Commerce Building; Pennsylvania Economy League, Inc. in the Union Trust Building; Business Branch of Carnegie Library of Pittsburgh in the Frick Building—to list just a few.

Within walking distance are the libraries of Duquesne University. Duquesne University Campus, situated on a high and picturesque bluff, overlooks the Golden Trangle. "The university library," says Eleanor McCann, librarian, "will be happy to welcome all SLA members to the campus." An unusual feature at Duquesne that should interest many is the George A. Kelly Model Pharmacy located in the School of Pharmacy. This school has a huge building program underway.

While the downtown libraries are accessible and interesting, no tour would be complete without a trip to Oakland, Pittsburgh's civic and cultural center. Here is a network of libraries that are not only situated close together but also work together. These are the libraries of Carnegie Institute of Technology, Carnegie Library of Pittsburgh, and University of Pittsburgh.

Carnegie Library of Pittsburgh has an exceptional technology department under the direction of Daniel R. Pfoutz. This department was the first of its type in the world. There is scarcely a librarian in the United States who does not know of the beneficence of Andrew Carnegie but not so many know that he built and endowed Carnegie Tech as a technical school because "he was particularly interested in the establishment of a wide range of night courses for working students of adult age who realized their chances for better jobs lay in greater knowledge in their fields."

There is no "central" library at Carnegie Institute of Technology at present although plans for one are being developed by progressive Kenneth H. Fagerhaugh, librarian. "This library," says Mr. Fagerhaugh, "will centralize all library services and collections. It will be a building separate from others on the campus and will be designed to incorporate all of the new-

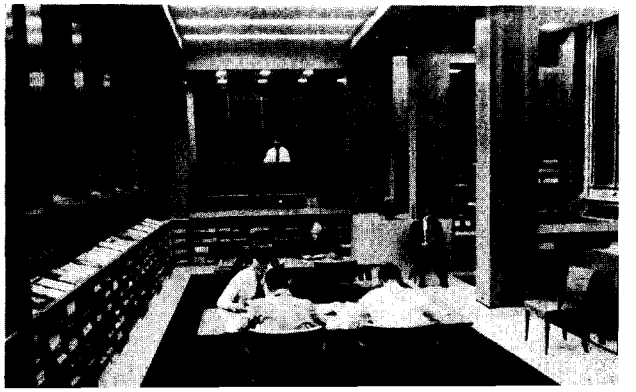
est features in library building planning." At present the book and periodical collections of slightly over 135,000 volumes are divided among several branches, the so-called "Main" library, and a reading room in the new Graduate School of Industrial Administration. This school is primarily for men holding bachelor's degrees in engineering who wish to work toward future management responsibilities rather than toward technical engineering careers. The reading room contains reference material and periodicals on industrial administration and economics.

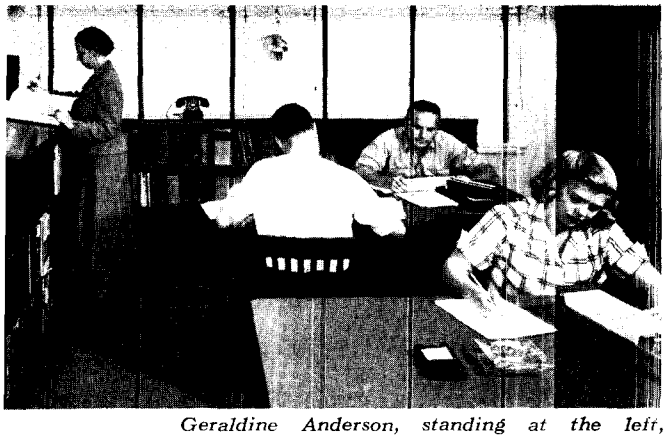
The University of Pittsburgh Libraries, comprising the general library and its associated libraries and a number of independent school and department libraries, contain approximately 665,000 volumes. The main library occupies three floors in the Cathedral of Learning. Other university libraries and special collections are housed in the Allegheny Observatory, Bureau of Business Research, Fine Arts Department, Stephen Foster Memorial, Graduate School of Public Health, Institute of Local Government, Johnstown Center, School of Retailing, Schools of Dentistry and Medicine, School of Law, School of Nursing, School of Pharmacy, School of Social Work, and the Western Psychiatric Institute and Clinic. There is a science-technology library in Alumni Hall, a physics library in Thaw Hall, and an engineering library in the penthouse of the new engineering hall. The University of Pittsburgh has acquired some of the most valuable property in the Oakland area; plans are underway to make it one of the most outstanding universities in the nation. The libraries are reflecting this growth; changes are being made constantly to keep up with the pace of progress. The librarian at the University of Pittsburgh is Lorena Garloch. Because of the type and size of the school, this assignment is an exceptional tribute to her abilities.

These college libraries and that of Carnegie Library are integral parts of the Pittsburgh scene. In addition to borrowing privileges, there is cooperation in the acquisition of material among the three libraries. From them come many of the ideas that have sparked the development of industrial research to the point where Pittsburgh is becoming one of the world's great research centers. *Greater Pittsburgh* in April 1955 said, "Today in the Pittsburgh district nearly $100,000,000 annually is spent to explore the unknown as well as what is believed to be known of iron and steel, aluminum, atoms, clay products, ceramics, biochemistry, pharmaceuticals and countless other items . . . Some 6,000 men and women scientists and laboratory technicians in fifty major research centers in this area depend on this work for their livelihoods." In most of these research centers, aiding the scientists and technicians, are special libraries and special librarians.

Mellon Institute of Research has always been known in Pittsburgh as the "cornerstone of industrial research." Since its establishment in 1913, the library has been considered an essential part of the Institute's facilities for research. Convention guests who visited the library in 1938 will remember it as a calm, unhurried li-

The reading room of Duquesne University is pictured on the left; the periodical room of the Mellon Institute of Research on the right.





Geraldine Anderson, standing at the left, looks up a reference in the technical library of the Pittsburgh Consolidation Coal Company.

brary, possessing a beauty and dignity different from that of any other in the city. It is a library that mirrors the slow, steady pace of the researcher with unlimited patience and untiring application. The periodical room of this library points up the need in research for constant awareness of current developments. This library receives 791 journals, of which 439 titles are bound. The book collection numbers 33,830 volumes. To SLA members the greatest change in the library will be the recent personnel change caused by the retirement of Edith Portman, for many years librarian of the Institute. To most Pittsburghers, Miss Portman will always be a part of this library; it seems to reflect her personality: quiet, competent, gracious, cooperative, and above all a dignity of purpose that insures accomplishment. The present staff is administered by Mary Jane Volk, for many years a capable assistant to Miss Portman.

Recently completed at nearby Monroeville are the main research laboratory buildings of the United States Steel Corporation. The applied research laboratory library moved into its new building during the first half of 1955. It has spacious and pleasant quarters. The resources of this library include approximately 5,000 books and bound periodicals, chiefly in the fields of chemistry, physics, and metallurgy; twenty file drawers of pamphlet material; eight file drawers of patents; and a file of technical journals. Frequent messenger service to 525 William Penn Place, facilitates borrowing of reference material from the central library and the technical information section. Catharine Oberly is librarian of this efficient, compact, research library.

Not far from Monroeville, Westinghouse Electric Corporation has recently completed a huge three-story research center. The plans for the new library were so progressive that they prompted the publication of an article in the November 21, 1954 issue of *The Pittsburgh Press* entitled "Major research libraries will get the new look." The librarian quoted was Westinghouse's well-known, inimitable Dr. Jolan Fertig. Distinctive in ideas as she is in personality, Dr. Fertig's library promises to be a lodestone for Convention guests — if it is completed by June.

Pioneers in research, the Pittsburgh Consolidation Coal Company maintains an effective library in its research and development division at Library, a small suburb of Pittsburgh. The exceptional organizational abilities of Geraldine Anderson, the librarian, are very evident in this library. It was started in April of 1947 when there were only five employees in the division. There are now 160; 64 are technical and 63 are laboratory technicians. The collection now totals between 4,000 and 4,500 books and bound journals.

The tour could be an endless one. There are so many outstanding research centers, completed or nearing completion: Gulf Research at Harmarville; Aluminum Company of America at New Kensington; Pittsburgh Plate Glass Company Laboratory at Springdale; Dravo Corporation at Neville Island; and many others, all of them concerned with planning for the future. During the past five years over $25,000,000 has been spent in the area in new research facilities, and expansion plans are still being developed. Visitors to the city who "cross over the bridge" during 1956 will find that Pittsburgh is no longer just the "Gateway to the West" but, through progress and development, is now becoming the "Gateway to the Future."

Have You Heard . . .

Translation of Soviet Journals

Complete English translations of forty-six Soviet periodicals in the fields of chemistry, physics, biology and medicine, agronomy, geology, electronics and associated theoretical and applied sciences will be published by Consultants Bureau beginning with the July 1956 issues. This is an expansion of the program begun by Consultants Bureau in 1949 with the cover-to-cover translation of the *Journal of General Chemistry of the USSR*. A number of the journals offered will be published in English for the first time. Prices range from $20 to $300 for a yearly subscription to a single journal in complete English translation. Further information on prices and titles of the journals to be translated will be furnished by Consultants Bureau, 259 West 14 Street, New York 11, New York.

Atomic Energy Information

The Atomic Energy Commission's Industrial Information Depository at Stanford Research Institute, Menlo Park, California, has recently acquired an additional 5,000 unclassified reports on atomic energy technology. Designated by the AEC as one of four depositories in the United States, the Institute operates as a public service to assist industry, particularly in the western states, Hawaii, and Alaska, in the utilization of atomic energy information. Library, reference, and literature-search services are provided without charge. The cost of photostatic copies of reports is 40 cents a page.

Library Equipment Catalogs

Librarians are reminded that most manufacturers and distributers of library equipment, furniture, and supplies issue new catalogs at the beginning of each year. Now is a good time to send for free, up-to-date brochures and price lists. Consult the advertisements in SPECIAL LIBRARIES for the names and addresses of library equipment companies.

Chemical Literature Microfilm Service

Microfilm copies of articles from its collection of chemical journals will be made available by the Chemical Library of the Johns Hopkins University. There will be no charge for this service when requested by former students of the chemical department or by researchers in the field. A catalog of the library's collection of some 260 important chemical journals has been issued. The venture represents, in part, the belief that libraries should provide microfilm to out-of-town users free of charge as an equivalent to making the original available to the in-town user.

New Library Building at Western Reserve

Dedication of the I. F. Freiberger Library Building, which will house the general university library collections, was held on February 5, 1956. The three-story building, erected at a cost of $1,600,000, has a capacity for more than 500,000 volumes and reading space to accommodate 600 students at one time. The School of Library Science and its Center for Documentation and Communication Research will be housed in the building.

Manuscripts Wanted

For many years *Wilson Library Bulletin* has followed a policy of publishing frequently short articles on special librarianship by SLA members. Elsa Freeman's "Help Needed—Special Librarians", which appeared in the November 1955 issue of the *Wilson Library Bulletin*, is a good recent example of such an article. Fannie Simon, SLA's special representative to The H. W. Wilson Company, would be pleased to receive other well written articles of this type or any material of interest to all librarians which is presented from a SLA point of view. Any questions or manuscripts should be directed to Miss Simon at *McCall's Magazine*, 230 Park Avenue, New York 17, N. Y.

LETTER TO THE EDITOR

As a librarian who has had much to do with initiating the documentation movement in this country and who many times has protested the insularity of librarians who have defined documentation as "librarianship carried on by amateurs", I am dismayed when things occur which seem to establish the truth of this definition. Certainly, the librarians who attended the recent conclave in Cleveland shared my chagrin when some of the amateurs on the program restricted special librarians to the role of book custodians . . .

We all know the cliche about the man in Moliere's "Le Bourgeois Gentilhomme," who at the age of 40 discovered he had been talking prose all his life without knowing it. How this discovery pales before the momentous discovery of the new Cleveland Center that words have meanings.

I feel that I have a duty to warn the "mere librarian', who has done competently a difficult and sometimes thankless job, that sometimes those who concern themselves with the esoteric problems of meaning and language do so in a way which shows an utter disregard for the King's English. Whenever they read such stuff and find it incomprehensible they should not, as Cassius suggested, modestly look for the fault within themselves. Rather, they should emulate Mencken, who, when confronted with a particularly turgid passage from Veblen, exclaimed, "What is the sweating professor trying to say now?"

MORTIMER TAUBE, *President*
Documentation Incorporated
Washington, D. C.

Off The Press...

Information furnished is not always complete. Omission of a price does not necessarily indicate that the publication is free.

Library Miscellanea

THE ARMED FORCES MEDICAL LIBRARY CATALOGUE, 1950-1954, 6 vols. Ann Arbor, Michigan: J. W. Edwards, Inc., 1955. $64.00 set.

Contains about 110,000 author and 80,000 subject entries.

ENGLISH COUNTY MAPS: The Identification, Cataloguing and Physical Care of a Collection, (Library Association Pamphlet No. 13). *R. J. Lee.* London: The Library Association, Chaucer House, Malet Place, 1955. Paper, 32 p. Ap. 50 cents.

REFERENCE AND SPECIAL LIBRARIES: Some Current Problems, (Proceedings of the Annual Conference). *Reference and Special Libraries Section, Library Association.* London: Library Association, 1955. paper, 35 p. Ap. 50 cents. Available from: Hon. Treasurer, c/o Guildhall Library, London E.C. 2, England.

Papers are entitled: Enquiry Techniques, Presentation of Information, Foreign Material-Selection, and Cooperative Provision of Foreign Material.

REPORT ON THE HARVARD UNIVERSITY LIBRARY: A Study of Present and Prospective Problems. *Keyes D. Metcalf.* Cambridge, Mass.: Harvard University Library, 1955. 131 p. $2.50.

A summary of the acquisition policies, cataloging, service to readers, interlibrary loan cooperation, space, personnel, administration, and finances of the Harvard University Library. A supplement includes various proposals, summaries, and a selected bibliography.

RESEARCH RESOURCES IN THE GEORGIA-FLORIDA LIBRARIES OF SIRF. *Richard Harwell* for the Southern Interlibrary Research Faculty. Atlanta, Georgia: Southern Regional Education Board, 881 Peachtree Street, N.E., 1955. Mimeographed, 241 p. $2.50.

A survey of research resources of Emory University, Florida State University, Georgia Institute of Technology, University of Florida, University of Georgia, and the University of Miami.

Miscellaneous References

THE ENCYCLOPEDIA OF JAZZ. *Leonard Feather.* Foreword by *Duke Ellington.* New York: Horizon Press, 1955. 360 p. $10.

A history of jazz from its beginnings to the present. Contains over 1000 biographies of important figures in jazz, musical analysis of jazz, a basic collection of jazz records, glossary of terms, and a bibliography of books and periodicals. 200 photographs.

THE ORGANISATION OF APPLIED RESEARCH IN EUROPE: Proceedings of the Conference Held at Nancy, October 11-13, 1954 (Project No. 191). Paris: Organisation for European Economic Co-operation, 1955. Paper, 258 p. $2. Available from Publications Officer, OEEC Mission, 2000 P St. N.W., Washington 6, D. C.

Presentation of papers and discussions on practical organization of research, human factor in research and team work, dissemination of results of research and their implementation, and search and patents. About 100 delegates from European countries participated.

PAPERBOUND BOOKS IN PRINT: An Index to 4500 Inexpensive Reprints and Originals with Selective Subject Guide, Fall 1955. New York: Bowker, 1955. Paper, 117 p. $1. Yearly (3 issues) $2.

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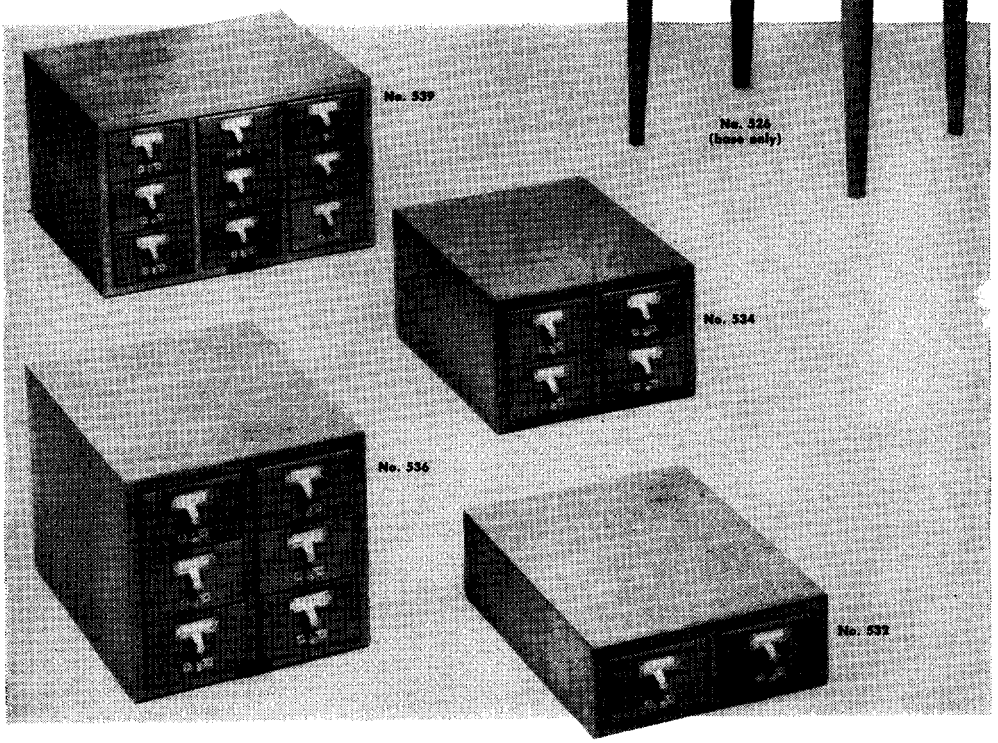

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