

ONE

Library Research Infrastructure for Humanistic and Social Scientific Scholarship in the Twentieth Century

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I have two major aims in this chapter. The first is empirical. I want to recover the practices, communities, and institutions of library researchers and their libraries in the twentieth century. There is at present almost no synthetic writing about this topic, and I aim to fill that gap. This empirical investigation points to a second, more theoretical one. There turns out to be a longstanding debate between librarians and disciplinary scholars over the proper means to create, store, and access the many forms of knowledge found in libraries. By tracing the evolution of this debate, I create a theoretical context for current debates about library research.

By library research I mean those academic disciplines that take as their data material which is recorded and deposited. Throughout the period here investigated, that deposit took place in libraries or archival repositories. In practice, the library research disciplines include the research branches of the humanities and a substantial portion of the social sciences: study of the various languages and literatures, philosophy, musicology, art history, classics, and history, as well as extensive parts of linguistics, anthropology, sociology, and political science. (In earlier years, economics would have been on this list as well.) It is work in these fields that I mean when referring to "library research" throughout this chapter. For convenience I sometimes denote these disciplines as HSS (for humanities and humanistic social sciences). I am not concerned with library use by nonexperts such as undergraduates, avocational readers, and the larger public, nor with library use by natural scientists, for whom the library is not, as it is for their HSS colleagues, a crucial laboratory.

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43

Three major ruptures mark library research in the twentieth century: World Wars I and II and the academic market crash of the 1970s. World War I broke the German dominance of the academic system, paving the way for American leadership. World War II not only confirmed the hegemony of American scholarship (and of English as the language of scholarship) but also produced an explosion in American higher education. The end of this expansion in the 1970s produced a final rupture, resulting in the research system that is just passing away today.

The periods between these transitions can be thought of as research regimes, periods in which there was a more or less stable library research world. I shall call these the formative, interwar, postwar, and implosion periods, respectively. In this chapter I try to sketch the basic qualities of research in each of them: its demography, its library resources, its basic reference structure, and the habitus of scholarship that those three things implied. Since the absence of prior literature forces my work to be largely descriptive, I cannot here theorize these "research regimes" in any deep way. For the moment, they are simply periods in which library research took a recognizable, somewhat constant form.

Since estimating scholarly demography and library resources is most conveniently done across the whole century, however, I shall begin with general discussions of those themes. I then turn to the main analysis, which is by period.

Demography

One central determinant of a research regime is its demography, the number of active scholars at a given time. There is no obvious measure of this number, nor are there consistent records for the likely indirect indicators: faculty numbers, PhD numbers, and society members. Since faculty data are the least specifically tied to research, I shall here use the other two—PhD numbers and society membership data—to estimate the demography of library research.¹ For the major HSS disciplines, figure 1.1 shows rates of PhDs produced per year from the 1920s. The figure shows the five-year average for the period labeled, this being considerably more stable than year-to-year figures. I have not included data earlier than the 1920s, because disciplinary identities were quite unstable before that time. I have used a

1. Data from 1921 to 1970 come from the Bicentennial Edition of *Historical Statistics of the United States* (Bureau of the Census 1975, 1:388). Statistics since 1970 are taken from various numbers of the *Digest of Education Statistics*.

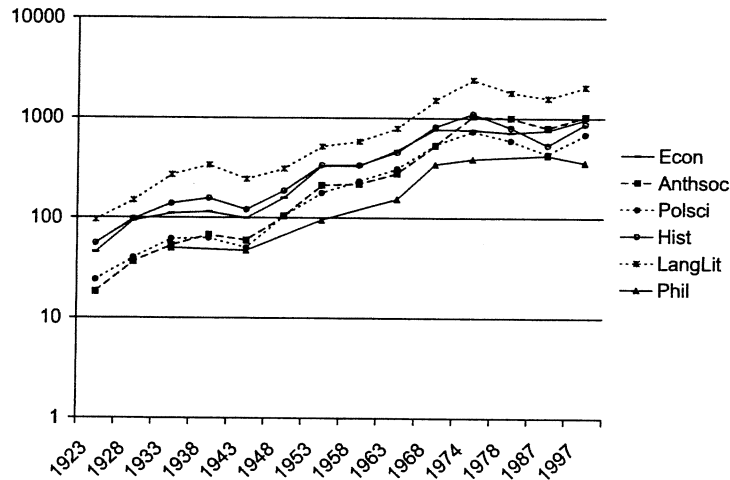


Figure 1.1. PhD production rates by discipline, 1920–1997

logarithmic scale to show the short-term changes that would otherwise be overwhelmed by the long-term (through 1974) exponential growth.

Another view of PhD production comes from the full (1920–95) data series on PhD's in the Millennium Edition of the *Historical Statistics* (Carter et al. 2006), which presents PhD series for "Foreign Languages," "Letters" (presumably all humanities other than "Visual and Performing Arts"), and "Social Sciences and History." (Note that psychology is excluded.) Table 1.1 presents this sum for each decadal year in its second column. The other columns use a simple extrapolation to estimate the total number of PhD dissertations ever written in HSS up to a given date (the third column) and the proportion of the total of all dissertations written by 2007 that were written *after* the date shown (fourth column).² For example, 530 PhDs were conferred in 1930, and 5,502 dissertations had been conferred, as of 1930, since the beginning of American academia, representing only 2 percent (100 percent – 98 percent) of the total of all dissertations available as of today. Roughly speaking, 5 percent of all American dissertations written by 2007 were written in the formative and interwar periods, about 20 percent during the postwar period, and the other 75 percent since 1970. By adding an initial founding generation (with European PhDs) to the ex-

2. I have linearly interpolated PhD production rates between a figure of 0 in 1890 and 140 (the first National Research Council number) in 1920. For the period after 1995, I have (conservatively) simply continued the 1995 figure to the present (2007).

Table 1.1 PhD production figures, 1890–2007: Language, letters, and all social sciences

Year	PhDs total	PhDs to year	%	PhD holders alive and unretired after year	Age (years)
1920	140	2,100	99	2,467	37.7
1930	530	5,502	98	6,455	37
1940	825	12,535	96	13,222	38
1950	1,337	19,900	93	20,644	40.1
1960	1,845	36,201	87	35,197	40.4
1970	3,638	70,413	75	72,137	37.8
1980	5,268	134,962	52	126,227	39.6
1990	4,812	181,535	36	158,284	43
2000	~6,000	240,464	15	191,574	44.9

trapolation of the National Research Council data above, the 1920–95 data series can be used to estimate the number and age of people with doctorates alive and in academia at any given moment. These figures are shown in the final two columns of table 1.1.³

The size of professional societies provides a useful alternative measure of the size of the library research world. Like the PhD figures, however, society figures are somewhat elusive. The Carnegie Institution did a census of societies in 1908. The American Council of Learned Societies (ACLS) (in its *Bulletin*) kept consistent statistics for its constituent societies from 1920 to 1960. After that time, there is no single consistent listing. Regularly issued sources like *The World of Learning (WOL)* and *The Encyclopedia of Associations* are erratic in coverage. The former appears somewhat more accurate (because the figures change more often), so I have followed it here after 1960. (To make the transition clear, I have given both figures—from the ACLS and from *WOL*—for 1960. Note that *WOL* is often substantially below the ACLS totals for that year.) I have located exact data for two societies only (American Economic Association and American Sociological Association).

I have provided two sums to estimate the size of HSS academia as a whole. The first (libusersum) sums the memberships of the “library-user” societies (not all of them shown) among the ACLS constituent societies.

3. I have assumed a founding generation of 350 academics, distributed rectangularly across the ages from twenty-seven to sixty-two, 10 academics to each age-year. I have further assumed that all PhDs are conferred at age twenty-seven and that all scholars remain in the PhD pool for thirty-five years unless they die. I have estimated death with standard U.S. cohort life tables for the white (gender-pooled) population. The early years of the data are largely driven by these initial assumptions and so should not be taken seriously.

Table 1.2 Society members

	Founding year	1908	1920	1925	1930	1935	1940	1945	1950	1955	1960
Am. Philological Assoc.	1869	594	656	1,007	1,100	1,057	1,050	1,020	1,112	1,193	1,400
Modern Language Assoc.	1883	650	1,650	2,795	3,642	3,810	4,412	3,900	6,128	8,289	11,000
Am. Historical Assoc.	1884	2,203	2,633	2,790	3,589	3,336	3,532	3,615	5,513	6,138	8,400
Am. Economic Assoc.	1885	751	2,335	3,547	2,710	2,506	2,966	3,961	6,631	10,411	14,018
Am. Political Science Assoc.	1903	308	1,300	1,521	1,747	1,834	2,637	3,299	5,140	6,084	7,000
Am. Sociological Assoc.	1905	100	800	1,193	1,530	1,300	999	1,242	2,673	4,584	6,638
Am. Philosophical Assoc.	1900	139	268	419	550	600	801	860	1,172	1,477	1,718
Am. Anthropological Assoc.	1902	269	—	—	936	925	1,101	1,108	2,937	3,265	4,200
Linguistic Society of Am.	1924	—	—	—	467	457	530	600	728	1,586	1,631
libusersum		5,350	9,642	13,272	18,089	17,683	20,269	22,255	35,578	47,844	62,011
Weighted LUS		4,381	6,841	9,255	13,483	13,314	15,136	15,883	24,132	31,460	40,713
Growth			1.56	1.35	1.46	0.99	1.14	1.05	1.52	1.3	1.29
Year	1960	1965	1970	1975	1984	1991	2001				
Am. Philological Assoc.	1,405	1,800	2,500	2,850	3,000	3,000	3,000				
Modern Language Assoc.	10,700	20,000	30,000	30,000	30,000	28,000	32,000				
Am. Historical Assoc.	8,500	12,000	16,000	18,500	14,000	14,000	16,000				
Am. Economic Assoc.	10,159	13,025	18,908	18,348	20,162	21,578	27,000				
Am. Political Science Assoc.	6,200	9,500	16,000	16,000	12,000	12,000	14,500				
Am. Sociological Assoc.	5,200	7,789	13,485	14,654	11,600	12,841	13,000				
Am. Philosophical Assoc.	1,703	2,267	2,900	5,500	6,200	8,000	10,000				
Am. Anthropological Assoc.	2,062	2,600	6,000	7,114	10,000	10,000	10,000				
Linguistic Society of Am.	1,800	—	4,500	4,500	6,000	7,000	7,000				
libusersum	51,029	72,365	111,793	123,966	120,162	123,619	140,100				
Weighted LUS	35,263	52,002	76,120	87,293	82,741	84,015	95,100				
Growth		1.47	1.46	1.15	0.95	1.02	1.13				

Table 1.3 Ratio of society members to PhD holders

Year	PhD holders	ACLS core	Ratio
1908	1,047	5,014	4.79
1920	2,467	9,642	3.91
1925	3,965	13,272	3.35
1930	6,455	15,804	2.45
1935	9,654	15,368	1.54
1940	13,222	17,498	1.32
1945	15,224	19,005	1.25
1950	22,108	31,306	1.42
1955	27,710	41,441	1.5
1960	35,197	54,374	1.54
1965	47,551	68,981	1.45
1970	72,137	105,793	1.47
1975	102,796	112,966	1.1
1984	139,305	106,962	0.77
1991	162,096	109,419	0.68
2001	195,506	125,500	0.64

The second sum (“weighted LUS”) weights these societies by a rough estimate of their use of libraries.⁴ This is a best estimate of the actual research group aiming to use the libraries. The “Growth” row gives the ratio of this second sum from period to period. Thus, the 1920 weighted LUS figure is 1.56 times that of 1908.

Combining the society data with the PhD data provides the interpretive key to this mass of information. Table 1.3 shows, for each year given, the ratio between the relevant societies figure—the total in the core ACLS societies (American Philological Association, Modern Language Association, American Historical Association, American Economic Association, American Political Science Association, American Sociological Association, and American Anthropological Association)—and the number of PhD holders currently “available,” in terms of the extrapolations discussed above. It is evident that the nonprofessionals were not immediately squeezed out of the “professional” societies but rather persisted in them almost up to World War II. Only around 1940 did the number of PhD holders in the system at a given time approach the number of society members.

A second important fact involves libraries more directly. The turnaround of this ratio after World War II reflects an increase in institutional member-

4. The humanists and historians count 1 per individual in this sum, the sociologists and political scientists count 0.5 per individual (also the linguists because so many of them are duplicated in other societies), and the economists and anthropologists count 0.25 per individual. There undoubtedly remains some duplication in these data.

ships for the purpose of library subscriptions, reported in detailed ACLS data not shown. The postwar period thus saw much wider availability of core research periodicals via an upgrading of library holdings below the first- and second-tier facilities.

The third crucial fact in this table is of course the plunge of the society/PhD ratio from 1970 on. A portion of this plunge, to be sure, reflects the emergence of PhDs in new fields outside the classical canon. But the majority of it probably reflects PhDs leaving academia. Indeed, by this estimate, from a quarter to a third of all PhDs in these fields were not to be found in the professional organizations, no doubt because they were not employed as academics.

Overall, these ratios imply that PhD numbers are the best guide to the size of library research academia before World War II, but that society membership numbers are the best guide afterward. The relatively slow growth of the societies in the interwar academic world (in table 1.2) conceals the rapid replacement of amateurs with professionals.

Libraries

This complex demography of research scholars inhabited a surprisingly small group of libraries, because graduate training—and to a considerable extent scholarship as a whole—was astonishingly concentrated for much of the twentieth century. As of 1925, one quarter of *all American PhDs ever conferred* had come from two institutions—Columbia and Chicago. Five institutions (those plus Harvard, Yale, and Hopkins) had conferred 50 percent, and ten institutions (those plus Cornell, Pennsylvania, Wisconsin, New York, and Illinois) had conferred 75 percent. Table 1.4 shows the equivalent statistics up through 1955. (Note that this is for all types of PhDs and hence includes education, speech, clinical psychology, etc.) As late as the early 1950s, fourteen institutions were responsible for half of all the PhDs

Table 1.4 Concentration of graduate education: All PhDs

Proportions of PhDs	Pre-1925	1926–37	1938–47	1948–55
One-fourth	2	3	5	5
One-half	5	9	11	14
Two-thirds	8	14	23	24
Three-fourths	10	19	29	33

Note: Figures are numbers of universities.

Table 1.5 Concentration by field, 1925–1935 and 1946–1955

	% of PhDs from top 5 departments		% of PhDs from top 20 departments	
	1925/26 to 1934/35	1946/47 to 1954/55	1925/26 to 1934/35	1946/47 to 1954/55
Psychology	45	31	80	54
Anthropology	88	71	96	83
Economics	42	45	82	69
History	37	39	73	64
Political science	42	41	80	70
Sociology	45	42	69	61
Fine arts	78	59	68	81
Classics	41	41	77	69
Philosophy	44	42	63	53
English	46	31	77	65
Other languages	45	—	82	—
All humanities	—	30	—	56
Total	38	25	74	50

Note: Figures are percents.

conferred in a given year.⁵ For two decades in the interwar and postwar periods, respectively, table 1.5 shows the figures for the particular fields of interest here. These are typically higher than the table 1.4 figures, since universities tended to specialize (table 1.5 looks at the most prolific departments in each particular field, not the same five universities in all fields). Despite the declines, as of the mid-1950s it is still true that from 30 to 40 percent of PhDs in any given HSS field come from the five most prolific departments and that about two-thirds come from the twenty most prolific departments. Nor did the identity of the top five change much: California replaced Hopkins, but Harvard, Yale, Columbia, and Chicago remained in the top group. This means in turn that well into the postwar research period most library research dissertations were based in a small handful of libraries whose names are familiar to any seasoned library worker then or now: Widener, Stirling, Butler, Harper, Doe, and so on.

Throughout its long dominance, this handful of great university libraries was complemented by a handful of equally great nonuniversity libraries. Just as amateur scholars remained in the professional academic societies much later than we imagine, so too did the great public and specialty li-

5. All these data come from Irwin 1956, 67–79; and Marsh 1936, 76.

braries remain major research centers. The public libraries of Boston, New York, Philadelphia, Baltimore (Peabody Institute), and Chicago were great indeed; the New York Public Library trailed only the Library of Congress (LC) and Harvard in sheer size, while the Chicago Public Library was the only library with over a million volumes west of the Appalachians until the University of Chicago Library passed that level in 1931. There were great private libraries as well: Boston's Atheneum, with its notable rare books; Chicago's Newberry and Crerar Libraries, covering humanities and sciences, respectively; the great medical libraries of the New York Academy of Medicine and the Philadelphia College of Physicians. Washington had not only LC but also the immense collection of the Surgeon General. With few exceptions the great nonuniversity libraries were in Boston, New York, Philadelphia, Washington, and Chicago, as were the great PhD-producing universities other than Yale, which was, however, only a two-hour train ride from New York. The extraordinary preeminence of these "library cities" was well recognized at the time (see, e.g., Bishop 1926, 215).

For most scholars, however, the first recourse was their college or university library. The data available, although incomplete, show a number of things about these libraries.⁶ First, all of them expanded rapidly during the twentieth century, in volumes, material expense, and, to a lesser extent, staff. Typically, the fifth-largest library at a given time point is about the size of the tenth-largest ten years later, and the tenth about the size of the twentieth ten years later. Second, libraries typically hired about one staff member per ten thousand volumes, a ratio that tended to fall somewhat, both at a given time and over time, as libraries grew larger. They thus probably had a fixed numerical core of workers—reference, cataloging, acquisitions, and other technical staff—who would simply handle more volumes as holdings expanded. These core workers were common to all libraries with research pretensions, but by the 1960s the elite research libraries (members of the Association of Research Libraries (ARL)—perhaps 1 percent of university libraries) had all passed beyond this technical core of library workers into a zone of purely optional hiring: area bibliographers and other such luxuries.

Third, within the elite libraries, however, there was considerable leveling both in volume numbers and in materials spending after World War II. This leveling was probably driven by government documents. The deposi-

6. Because of space constraints, I have removed here a detailed analysis of university library expansion based (up to 1961) on the twenty-four universities with complete data (Molynaux 1986) and (after 1961) on the ARL data (various years of *Academic Library Statistics*). The conclusions presented in the text summarize this detailed analysis.

tory system sends every premier state institution the same mass of government documents, holdings that can be up to one-third of a collection. The apparent leveling in volumes thus conceals a great hidden difference in early monographic and serial holdings built up before World War II. These enduring differences remained crucial in disciplines like history, English literature, and German studies. It is thus not at all surprising that for the first half of the twentieth century, the roster of the top five university libraries in terms of sheer volumes coincides almost exactly with the roster of the five most prolific HSS PhD-producing universities: Harvard, Yale, Columbia, and Chicago were among the top five until 1961, when Chicago—then in financial rout—fell out.

Throughout the formative, interwar, and even into the postwar periods, then, library scholars were generally trained in first-rate libraries located in or near other first-rate libraries and then spent their careers in considerably less excellent libraries far away from this remarkable core. Because of this career pattern, it is not surprising that through all three periods the university librarians as well as the American Library Association (ALA) and the disciplinary societies emphasized investment in library infrastructure that would enable the location of distant resources by scholars who remembered fondly the libraries of Boston, New York, Washington, and Chicago. These located sources were then either borrowed via interlibrary loan or visited during holiday or sabbatical research trips.

By library infrastructure, I mean all those tools that enable scholars to conduct their research in libraries. To a certain extent, these are basic tools: bibliographies, indexes, and abstracts that identify sources in the three basic kinds of materials—periodicals, books, and archives/documents. But library research involves not only these core bibliographical tools but also highly organized guides to particular materials in particular areas. If one surveys the eleven editions of the ALA's *Guide to Reference Books*, the greatest increase is not in the core tools but in these reference works on "special subjects." These works took up a third of the pages of the first edition of the *Guide* (Kroeger 1902), half of the third (Mudge 1923), and two-thirds of the seventh (Winchell 1951). By contrast, core infrastructure remained about 12 percent of the pages in all three.

Core and specialized reference tools combined with trends in demography and library structure to produce a particular habitus of research, a way of doing library work in the scholarly environment of a particular moment. In what follows, I shall sketch for each period (research regime) how the demography, the libraries, and the tools combined to create a particular world of research practices. I apologize if the discussion is sometimes

excessively detailed. These research worlds are old and unfamiliar; they can be re-created only by detailed description and analysis.

The Formative Era

Core Infrastructure

The formative era reference discussions in Kroeger 1902 and Mudge 1923 show that the most important scholarly reference sources were in French and German. The scholarly reference librarian—there were few of these—was expected to read those languages as well as English.

Periodical bibliography was surprisingly well served. There were numerous, if incomplete, German works, while in English there were the British Museum *Catalogue of Printed Journals* and Ayer's newspaper annual for American newspapers. Most important, *Poole's Index* gave a cumulated guide to the whole of nineteenth-century English-language periodical literature, the *Annual Literary Index* covered about 140 English and American periodicals from 1891 to 1910, and the *Reader's Guide to Periodical Literature* (an ongoing cumulative periodical author/title/subject index) began in 1900.

The brainchild of H. W. Wilson, the *Reader's Guide* was only one of many ways in which this remarkable man transformed the face of American knowledge (on Wilson generally, see Lawler 1950). Wilson made two great discoveries. First, he realized that by locking the type on an entry but not on a page he could break up each monthly issue to be re-sorted into longer cumulations.

Second, he cracked the collective-action problem that had plagued libraries for decades by charging *Guide* subscribers in proportion to the number of indexed periodicals to which they actually subscribed, charging, moreover, on a sliding scale that fell heavier on larger libraries. Despite the predictably anguished howls, Wilson's *Guide* became the progenitor of (and provider of seed money to) dozens of other indexes. Moreover, his pricing model facilitated most of the important bibliographical projects of the following decades, and his firm became the backbone of American librarianship. By 1907 Wilson had split off an academic version of the *Guide*, the *Supplement*, which in 1919 was renamed the *International Index* and absorbed the foreign-literature indexing consortium sponsored by the ALA. This would be the standard periodical bibliographic tool for smaller research libraries—and the first line of attack in the larger ones—until the Internet age.

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53

Another bibliographic creation of the formative period was the *ALA Index to General Literature*, which indexed essays in books and which has survived in modified form (*Essay and General Literature Index*), although, unlike the *Reader's Guide*, it never spawned a scholarly version. Indexes came for newspapers as well: the *Times* index in 1906 and the *New York Times* index in 1913.

Book bibliography lagged. The various pieces of what is now *Books in Print* emerged in the 1890s from Wilson's predecessor and chief competitor R. R. Bowker. The British Museum *Subject Catalogue to Modern Books* started appearing in 1903, and the immense Courtney *Register of National Bibliography*—a bibliography of bibliographies—was published between 1905 and 1912. But there was no general subject index to books in print, and indeed, LC started selling its catalog cards—a major step toward national standardization in cataloging—only in 1901.

There were, of course, dozens of catalog classifications at this point; the Dewey decimal system was *primus inter pares* but clearly had difficulty with immense collections. Because many formative era research libraries had their own cataloging systems, scholars moving between research libraries had to master different systems. This was an onerous job, of course, but classified catalogs were themselves a recent innovation. Whereas most prior (before 1875) classifications had located books by acquisition number or some other irrelevance, Dewey's was "relative," permitting the insertion of new books in their (subject) position as they were acquired. As a result, only with the Dewey classification did shelf browsing become a viable research technique. It is striking in this regard that unlike Continental libraries, American university libraries appear to have been open stack for researchers from very early on.⁷

The situation was less auspicious with materials other than periodicals and books. Although lists of Continental dissertations were available, the American system had no centralized listing until 1933. The great indexes to British government documents were unmatched in the United States, although the *Checklist of Public Documents* went into its third edition in 1911, and subject indexes emerged for various sub-areas of government publications—from the Bureau of Labor Statistics, the U.S. Department of

7. For a historical discussion of one library's successive catalogs, see Weinheimer 1996. On open stacks, the ALA survey in the mid-1920s notes that of the larger U.S. college and university libraries, only the college libraries (ALA 1926, 2:167ff.) had open stacks for all students. University stacks were generally closed to undergraduates. See also Richardson 1908. For a shocked American reaction to Continental libraries, see Johnson 1943, 172, 181.

Agriculture, and even state governments. Government documents would be an enduring weak link in the American library chain.

Archival tools by contrast were strong. Particularly conspicuous were the Carnegie Corporation–sponsored guides to European archival materials relevant to the history of the United States. Spain, Russia, Germany, Paris, Rome, the British Museum, and the Public Record Office (PRO) eventually got separate volumes. Another important source was Johnston and Mudge's *Special Collections in Libraries in the United States* (1912), sponsored by the U.S. Bureau of Education, which reported on over two thousand libraries and included a chronological list of major imported collections and their acquirers.

Among general reference tools, an important body had to do with learned societies, which issued most journals. Here again, the German source (*Minerva*, which ceased publication in 1938, then reappeared in modified form after World War II as *World of Learning*) was the best. Both the Germans and the British had also produced massive national biographical dictionaries by the formative era, and *Who's Who in America* began in 1902.

Specialized Reference Tools

As for specialized areas, music is a good example, covered by multivolume bibliographical sources like Eitner's *Lexikon* and the British Museum *Catalogue of Printed Music*, as well as comprehensive multivolume reference sources like Grove's *Dictionary of Music* and multivolume surveys like the *Oxford History of Music*. Similarly vast bibliographies, reference works, and multivolume histories covered the various modern literatures, and *Notes and Queries*, an ongoing list of open research questions in literary fields, had been in existence since 1850. *Dramatic Index* began in 1909 (one of the few reference tools to disappear completely; it ceased publication in 1949).

In the social sciences were equally vast multivolume German bibliographies and handbooks, complemented by English-language equivalents—Palgrave's *Dictionary of Political Economy* in three volumes, for example. Statistical abstracts existed for most advanced economies, and Moody's, Poor's, and similar tools for business reference emerged in the 1910s. The discipline of history had numberless specialized reference works.

Across all disciplines, such specialized tools were most often multivolume works that assembled bibliography, substantive analysis, and ongoing

scholarly debate into a single source. Although usually aiming at completeness as of a given date, these in practice evolved steadily through ongoing supplements and continuations.

The formative era scholarly researcher thus worked in a surprisingly rich reference environment. Not only were these European and American specialized works available, but the core infrastructure of ongoing indexing and bibliography for both books and periodicals was already under construction. Document indexing was somewhat weaker, although still substantial, and a few guides to important archives were available. On the debit side, there was no comprehensive list of all the books in print, much less a guide to where they might be, nor a single subject cataloging system for them.

The Habitus of Scholarship

Research habitus is founded in demography. Table 1.1 suggests that in the formative period there were about a thousand PhDs across all the social sciences and humanities. Scholarly societies—at that time totaling about four thousand members—were thus full of amateurs: do-gooders in the American Sociological Association and American Economic Association; adventurers, explorers, and museum staff in the American Anthropological Association; antiquarians in the American Historical Association (AHA); and so on. Thus, the center of research life at this point was often not the university but rather a loosely public sphere of knowledge creation for which we have no easy name and which vanished without a trace in the triumph of the professors. Chances are that the university and professionalizing scholars were younger on average than the amateurs.

Given that scholarly societies typically had only a few hundred members, PhD scholars knew well their disciplinary colleagues, those colleagues' work, and even their students' work, for journals published lists of doctoral work in progress. Note, however, that many more persons than the PhD-trained core taught in universities and colleges in this period: there were 36,000 faculty (of all types) in 951 schools in 1910 (Bureau of the Census 1975, 1:383). The expanding group of PhDs thus represented a serious upgrading of faculties as well as of societies.

Not only was graduate education concentrated in a few universities in this period, but the books of those universities were to a considerable extent concentrated in departmental, rather than central, libraries. Such major university collections as at Chicago, Hopkins, Illinois, and Indiana kept the majority of their books in departmental libraries, and even Columbia and

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56

Harvard had 200,000 and 350,000 departmental volumes, respectively, in the late formative era (Hanson 1917, 27). Such departmental libraries were typically small collections of core journals, indexes, and reference works, as well as a set of crucial monographs. These were often but by no means always duplicates of centrally held materials.

American departmental libraries derived from the German "seminary" library: the small teaching collection used by a professor and his students as a basis of intensive instruction and investigation, ideally in a location immediately adjacent to the main library stack (Adams 1887; for autobiographical accounts, see Burgess 1934, 198; Hicks 1968, 94; Larson 1939, 256). Harvard's Widener Library (1915) was designed on such a model, with rooms for seminar collections on its top floor and faculty research offices scattered throughout the building. Ideally, such departmental libraries were staffed by subject specialists; at Chicago, for example, these staff were the Fellows (the most senior graduate students) of the department involved (University of Chicago Library 1896, 6).

Departmental libraries meant that library research faculty had immediate, physical access to the principal tools of their trade: bibliographies, indexes, reference works, major periodicals. These were not in another building, much less across a large campus, but down a hallway or even next door. (For discussion, see Bishop 1926, 67). Moreover, the departmental library system meant that professors and their graduate students saw each other on a daily basis, giving graduate education an intensity evident in scholarly autobiographies of the period.

Not only were faculty and graduate students often running their own facilities, but faculty also played a substantial role in acquisitions. At Chicago, faculty acquisition requests might go directly to the trustees, bypassing the powerless superintendent of departmental libraries (sociologist W. I. Thomas). Indeed, a survey in 1917 found an extensive faculty role in acquisitions at most of the twenty-four major university libraries considered (Hanson 1917, 20ff.). This, too, reflected the German model, where seminary libraries began as the personal, home collections of particular professors (see, e.g., Sihler 1930, 62). A first-generation American academic like Columbia's John Burgess (1934, 217ff.) conceived of the university library as simply a larger version of the faculty-conceived specialty library.

The departmental library concept was, however, appropriate only to the great research institutions, whose librarians, even as late as the 1930s, were typically PhDs in disciplines (Zimmerman 1932, chap. 2). Most academic librarians detested departmental libraries on grounds of duplication, disarrangement, loss of books, loss of central control over cataloging and staff,

and a host of other evils (Bishop 1901). Moreover, sheer library size was already raising the possibility of ending direct faculty access to books, either through a closed-stack system or by removal of books to a specialized stack building. Harvard's librarian William Lane made the case against such a centralized system with revealing vignettes of faculty research, which show that even at this early moment HSS library research practice already included extensive, unsystematic examination of myriads of materials "that would ordinarily be regarded as worthless" (Lane 1903, 14). Such trolling would never be recognized by most librarians as legitimate research practice, and even at the time the librarian colleagues discussing Lane's paper were already willing to send such little-used materials to nationally centralized depositories like LC, forestalling the possibility of such research altogether.

The divide between faculty and librarians over research practice was thus already evident in the formative era. Although the wide interests of faculty in the social sciences and modern languages were leading them to desire combining departmental libraries into larger units (Commission on the Future Policy of the University Libraries 1924, 55), they still wanted the convenience of concentrated reference resources as well as immediate access to large quantities of rarely used materials. By contrast, the librarians wanted centralization, administrative control over acquisitions, and—in some cases—even closed stacks, to which they believed systematic indexes would provide sufficient access.

Correlatively, librarians in the formative era were already beginning to demote faculty from their status as the dominant users of the library. Librarians' new rhetoric of "general education" emphasized general-periodical reading rooms, facilities for undergraduate education, and so on. This rhetoric portrayed librarians as defenders of liberal learning against "narrow" faculty specialism (Bliss 1912; Anonymous 1916; Bishop 1926, 219–22).⁸ Faculty and graduate students, by contrast, found specialization both liberating and exciting.

Despite these harbingers of conflict, the relation between formative era faculty and their libraries was for the moment extremely close. Under the departmental library system, the small elite of true research faculty worked in close physical proximity to their local library resources and their gradu-

8. Librarians were not the only opponents of specialism. A substantial number of PhDs, particularly in literature, found graduate training in the German (i.e., philological) style to be pettifogging inanity. See, e.g., Van Doren 1936, 95ff.; Leonard 1927, 224; Perry 1935, 96ff.; Canby 1947, 197ff., 212ff.; Pattee 1953, 210; Johnson 1943, chap. 13. Historians (e.g., Hicks 1968, 83ff.; Larson 1939, 256ff.) found seminars much more rewarding.

ate students. They controlled much of local library policy. Their reference infrastructure was surprisingly good and rapidly improving. Most of their librarians were either scholars themselves or had extensive training in bibliographical research (see, e.g., Richardson 1992). Concentrated in a few universities, library scholars also typically enjoyed conspicuously rich local holdings, to which their wealth of reference tools gave access, not to mention that most of the library resources of the United States were within a six- to eight-hour train ride of each other.⁹

The Interwar Era

Core Infrastructure

An important general change in the interwar era was the decline in reference tools written in foreign languages, from about half of Kroeger's (1902) core reference tools to a quarter or less in Mudge 1923. This was another divide between librarians and faculty, for most PhD programs required two foreign languages until well into the postwar period, and faculty remained heavy users of foreign source material.¹⁰

In periodical bibliography, Wilson's *International Index* continually expanded its coverage, steadily splitting off sub-areas as they became too large. Among the HSS spin-offs (which also took journals from the *Reader's Guide*) were the *Index to Legal Periodicals* in 1909, *Education Index* in 1928, and *Art Index* in 1931. In 1920 the *International Index* was indexing two hundred periodicals, seventy-four of them in foreign languages. In 1931 there were three hundred indexed, eighty-three of them in foreign languages.

Once a periodical reference was identified, however, one had to find a library with the periodical. The interwar era saw a great advance in this task: the 1928 *Union List of Serials in the United States and Canada*. The idea of "union lists"—lists of holdings across some set of libraries—was popular among librarians in the interwar period. At first regional, the movement aimed to provide scholars with comprehensive guides to local resources and to help avoid "costly duplication," a librarian obsession. Although early discussions about a periodical union list dated from 1912, not till the 1920s did an ALA committee, along with H. W. Wilson, achieve the goal

9. For example, W. E. Leonard's Columbia dissertation on Byron took him to "the libraries of Cambridge, Boston, Brown, as [well as] about New York." (Leonard 1927, 237).

10. I have no circulation evidence from the interwar period, but one can only assume that use of foreign sources was higher then than later, and, as of May 1956, 27 percent of faculty charges from the University of Chicago Libraries were in foreign languages (Sheniti 1960, 59).

by jawboning the necessary serial records out of over two hundred libraries and the necessary advance subscriptions out of forty (McHugh 1984). By consulting the *Union List*, a scholar could locate the nearest of the 226 reporting libraries that possessed any particular volume of 75,000 periodicals (McHugh 1974, 2). To be sure, whole states were absent; a full 42 percent of the reporting libraries were in Washington, New York, Boston, Chicago, and Philadelphia. But the overall utility of the book was enormous (McHugh 1984, 241–42).

Another type of serial resource proved a complete failure in this period, however. Although *Psychological Abstracts* (1927) produced some half-hearted imitators, the abstracting concept made slow headway outside medicine and the sciences (Manzer 1977, 134ff.). A *Social Science Abstracts* journal ran from 1929 to 1933 and then failed. By contrast, *Chemical Abstracts* (1907) was already a longstanding success, providing an example librarians would repeatedly tout (in vain) to HSS scholars.

The union list concept was occasionally applied to books. The 1919 *Census of 15th Century Books Owned in America* covered 13,200 copies of 6,640 titles, giving bibliographical information and location, thereby immensely aiding scholarly access. Like many works in this era, it was produced by the same distributed-processing model that had produced the *Oxford English Dictionary*; scattered libraries and book owners contributed their own holdings or indexes to the larger enterprise, in this case run by the Bibliographic Society of America.

But more general book bibliography lagged behind. The Library of Congress had collected cards on an exchange basis since it first entered the card business in 1901 (Lewis 1985, 19ff.). It sold copies of its in-house cards to libraries wishing to save cataloging costs and exchanged cards with the other great U.S. collections as a way of building up a single national catalog, which came to be known as the National Union Catalog (NUC).¹¹ By 1926 the collection had reached about two million cards, about one quarter of the estimated eight million research works owned in America (Schwegmann 1942, 230). A five-year Rockefeller gift (1927–32) built the collection to 6.8 million cards. Partial copies of this newly complete card catalog (“depository sets”) were made available at about forty locations throughout the United States from the early 1930s. For those near enough to use them, these could shortcut postal requests through the LC clearing

11. The libraries whose exchange cards were amalgamated into the NUC are no surprise (for a full list, see Winchell 1930, 35–36): among universities, Harvard, Princeton, Cornell, Illinois, Chicago, North Carolina, and Michigan; among public libraries, Boston, New York, and Washington; among specialized libraries, the John Crerar and the Pan American Union.

house for interlibrary loans, which handled about ten thousand requests a year by the 1930s (Kletsch 1936).¹²

Exchange was necessary because despite the immense holdings of the major scholarly collections, overlap between them was surprisingly small (although to the more penurious librarians it seemed surprisingly large; see, e.g., Merritt 1942, 74). A 1942 sample study traced 2,442 randomly chosen NUC cards in the card catalogs of the forty-six ARL members (Merritt 1942, chap. 4). A scholar at Harvard would find 913 of those books and a reader at the New York Public Library 774. But only 244 were in both libraries. Most of the holdings of each library were thus unique with respect to the other even though they had a substantial common core. For a researcher, a good library would have extensive core and unique holdings, as did all the great university research libraries. But if even in the best libraries exchange could be important, for lesser libraries it was essential. And NUC provided the foundation for that exchange. Probably in part for this reason but also because of its easier expandability, major libraries were steadily drifting to the LC classification after 1920, by which time most LC classification schedules were available in print. This made scholarly life considerably simpler.¹³

The interwar situation for archives and manuscripts was complex. British historical manuscripts were located and to some extent indexed by the *Reports* of the Historical Manuscripts Commission, which began to appear in 1914. The huge holdings of the PRO were the subject of a two-volume

12. Chicago, Harvard, Michigan, the Boston Public, the John Crerar, and the U.S. Department of Agriculture were other libraries loaning more than a thousand volumes a year in this period; ALA 1926, 2:221–22.

13. On this change generally, see Tauber 1940, 191ff.; Tauber 1941. Reclassification was a time-consuming process that got in the way of scholarship. See various entries in the *ALA Catalogers' and Classifiers' Yearbook*, e.g., 1:67ff., 113ff. (1933), 5:65ff. (1936), and 8:104 (1939), the last noting the transition of the Boston Public Library into the LC fold. Tauber (1941, 32) finds a median of eleven years to reclassify a college or university library. Jacobs and Spencer (1933) chronicle the saga of reclassifying about forty thousand titles in the University of Rochester Library "after considerable prayer and some correspondence, but without much light from either source" (64). For an unflattering portrait of library life in a peripheral state university library in the late interwar period, see Wilson et al. 1939. A similar unevenness is shown in Tauber 1941, chap. 7. Tauber found that most faculty did not care much about classification, whereas librarians assumed that scholars would prefer classifications that "suggested" new materials. Faculty were uninterested in librarians' thoughts about what they ought to read, viewing the librarians purely as technocrats who should restrict themselves to guaranteeing the location of works whose identification as important was faculty prerogative. This was yet another sign of scholars' early disinterest in general-purpose indexing. Tauber (1941, 230, 238) found that although about 70 percent of faculty surveyed were in the stacks at least once a week, less than 40 percent of them looked in the catalog before going into the stacks.

guide in 1923–24. In the United States, the LC Manuscript Division started circularizing repositories in the 1910s and issued a *Check List of Collections of Personal Papers* in 1918, covering 56 replying libraries (out of 232 circularized). A 1924 edition brought coverage to 131 repositories. Although not quite as concentrated as other library resources, archival sources also tended to be on the East Coast.

More generally, American public documents, from 1895 to 1940, were collected and indexed in the *Document Catalog* issued at the end of each congressional session. Other government bibliographies were numerous but haphazard (Smith 1947). The historical documents situation improved suddenly when Congress, after decades of lobbying, finally created the National Archives in 1934. The Depression provided another unexpected boon for library researchers when Harry Hopkins put unemployed scholars to work preparing inventories and bibliographies of public and private document holdings (the Works Progress Administration's Historical Records Survey; Kidder 1943).

General reference tools also made some advances in the interwar era. The *Encyclopaedia Britannica* produced an important new edition (the fourteenth), the *Oxford English Dictionary* was completed (1928), the *Dictionary of American Biography* (1943) brought American biography onto a par with its British and Continental cousins, and White's *Conspectus of American Biography* (1937) finally provided an index to the haphazard *National Cyclopaedia*. The *Times Atlas* appeared in 1920, and the first edition of the *Atlas Mira* in 1937.

Specialized Reference Tools

While the core infrastructure made major gains in the interwar era, in specialty areas the harvest was yet richer. *Granger's Index* to poetry dates from 1918, and we find in Mudge 1923 author dictionaries (giving use of words, indexes of subjects, and lists of characters) for writers from Homer and Dante to Balzac and Hawthorne. Literary students also had the MLA's *American Bibliography* from 1921, a general index to all writings by Americans on the modern literatures. The British equivalent, the *Annual Bibliography of English Language and Literature*, first appeared in 1921 as well, as did *The Year's Work in English Studies*, an annotated annual review. The monumental *Encyclopédie des sciences religieuses* had reached dozens of volumes by the mid-1920s, and an eight-volume *Bibliographie buddhique* appeared in 1930–37.

As for the social sciences, in 1915 a consortium of special librarians

launched the Public Affairs Information Service (PAIS)—a comprehensive guide to current affairs and related periodicals that was issued weekly and cumulated annually. Unlike the *International Index*, PAIS included government documents and other nonjournal sources. Moreover, it was selective and anchored in the research environment, being produced in the New York Public Library's Economics Section. Other important social science tools emerged as well. The first *Encyclopedia of Social Sciences* (fifteen volumes) appeared in 1935, and the enormous cumulative *London Bibliography of the Social Sciences* appeared in four volumes and two supplements from 1931 to 1937. The League of Nations, the International Labor Office, and other international organizations spawned a host of annuals, bibliographies, and reviews throughout the period. For the more data hungry, the *Dictionary of Occupational Titles* saw publication from 1939 to 1944. Finally, history saw a number of major reference works in this period: the *International Bibliography of the Historical Sciences* (beginning in 1926), the *ALA-AHA Guide to Historical Literature* (1932), the *Encyclopedia of World History* (1940), and, for the current period, *Facts on File* (1940).

This explosion of reference works—mostly generated by specialists themselves, although sometimes in alliance with special librarians—meant a quantum leap in the ability of library scholars to find and use what they actually had in their own libraries. All the same, reference tools could help only if a library owned them. Even so large a library as Cornell—the ninth largest academic library in the United States at the time—possessed by the end of the interwar period only 55 percent of the titles in Mudge and indeed only 41 percent of the Mudge titles in social science (Wilson, Downs, and Tauber 1947, 138).

The Habitus of Scholarship

The explosion of specialized reference works led to changes in the practice of scholarship in the interwar period; library researchers drifted away from the general infrastructural tools of the librarians toward the specialized ones created by their colleagues. Indeed, it is not clear that they ever left the specialist universe.

Again, demography sets the stage. Although library-based academia nearly tripled in size in the 1910s and 1920s, it remained a small world—probably about ten to fifteen thousand total. Journals continued to list doctoral dissertations under way, suggesting that disciplinary scholars kept up on all ongoing or new doctoral work. Academia got a little younger as the new PhDs came to dominate and as PhD production expanded, but

average age began to rise again as PhD production slowed. Disciplinary professionalization gradually drove the amateurs out of the scholarly societies, which consequently grew only slowly. Typically, they had from 1500 to 2000 members. To the individual academic researcher, this replacement of dilettantes by experts meant better colleagues without a large increase in quantity. At the same time, faculties (as opposed to societies) still included many non-PhDs. Total faculty numbered 48,615 in 1920 and 82,936 in 1930, while the HSS research group numbered about 10,000 and 18,000, respectively. The ratio did not change substantially.

Much of the scholarly habitus of the formative period carried over into the postwar period (see, e.g., Hicks 1968, 138). The departmental library system continued, and in many cases departments still controlled the purchase of books for their own libraries. An ALA survey in the mid-1920s found that departmental libraries in the twenty universities reporting typically contained about a quarter of a university's collection (although some universities included law or medical school libraries as "departmental" libraries). Yale, for example, had thirty-four different departmental libraries (ALA 1926, 2:182), containing 17 percent of the total collection.

That immediate physical access to books was regarded as necessary to first-class scholarship is evident from a 1924 University of Chicago report: "For the humanistic departments and schools the provision of library facilities which will in reality facilitate and encourage discovery means, in practical terms, the provision of a study immediately adjacent to the stacks for every senior member of the Faculties and an individual working space in the stacks for every junior member of the Faculties and every active regular graduate student" (Commission on the Future Policy of the University Libraries 1924, 4). Not surprisingly, scholars in this period were extremely active library users. In a survey of faculty in two large universities, Tauber (1941, 230) found that around 25 percent of faculty entered the library stacks daily and another 40 percent at least weekly. For humanists in particular the equivalent figures were 44 percent and 32 percent, respectively. Even allowing for response bias, these are extraordinary figures.

But the days of the departmental system were numbered. The great centralized research libraries all date from the late formative and interwar periods: Harper (Chicago) in 1910, Doe (Berkeley) in 1911/17, Widener (Harvard) in 1915, Gilman (Johns Hopkins) in 1916, Stanford (unnamed) in 1919, Michigan (unnamed) in 1920, Walter (Minnesota) in 1924, Illinois (unnamed) in 1926, Sterling (Yale) in 1931, and Butler (Columbia) in 1934 (Kaser 1997, 87–101). And if most of these newly centralized libraries

followed Widener's lead in containing departmental or seminar facilities, they nonetheless removed those facilities from the faculty's home space. Faculty now had to leave their main classroom buildings to do graduate training and library research.¹⁴

With centralization came administrative control, particularly of acquisitions, which were running forty thousand or more items per year at the major research collections by the end of the interwar period (Molyneux 1986). An Special Libraries Association study of departmental libraries found fully 10 percent of staff time devoted to "watching for and acquiring new materials" (Hausdorfer 1938, 22). Although faculty no doubt ceded quickly on this burdensome issue, faculty involvement remained intense. So large an institution as Penn was still able in 1940 to obtain detailed analyses by more than fifty faculty of the adequacy of its holdings in their research areas (Bibliographical Planning Committee of Philadelphia 1940).

For their part, some librarians also resisted the drift toward centralization and generalism. The combination of specific subject expertise with library training had been implicit in the role of graduate fellows in departmental libraries, and such "research librarians" became standard in the new industrial libraries. The Carnegie Foundation briefly invested in a similar idea for academic libraries (Henkle 1938). The issue of specialized knowledge was related to the larger debate on the proper duties of reference librarians. Reference librarians prepared bibliographies on demand in many research libraries (Rothstein 1954, 105ff.). The Missionary Research Library's staff, for example, would prepare annotated bibliographies, make copies of excerpts, and follow bibliographical trails for patrons (Hering 1931). But despite some gestures toward subject specialization, centralization inevitably combined with financial pressures to guarantee that a minimalist theory of reference service came to dominate most university libraries in the interwar period (Rothstein 1954). The researcher was left to his own devices, and another wedge appeared between faculty and librarians.¹⁵

14. There is some indication (Works 1927, 66) that support for departmental libraries was strongest in the sciences, which were relatively more able to retain those libraries near laboratories and faculty offices. Humanists appear to have wanted ready reference materials near the stacks and hence often went along with centralization. The Works study shows, however, that "helpers" in departmental libraries in this period were often appointed and paid by the department, not the library (Works 1927, 131). For a balanced view of centralization—unusual at the time—see Branscomb 1940: chap. 7. On graduate teaching in the (Harvard) library in this period, see Perry 1935, 242ff. On the defeat of a plan to site the Yale Graduate School adjacent to Stirling Library, see Cross 1943, 183.

15. It was in the interwar period that librarians first began to do research on "scholarly needs for information." All this work (which dates from the 1930s) concerned the natural sciences or medicine (see Stevens 1951, 13ff.).

Beyond the individual library, the demographics of the system drove other important changes. Rapid expansion of the PhD pool decentralized graduate education. Inevitably, there was a rise in locally based dissertations, a change evident in the shift to newspaper sources in history dissertations (McAnally 1951, 40) and reported in autobiographies as well (e.g., Hicks 1968, 161ff.). Thus, while the professional associations and the librarians collaborated to build resources for research on the traditional canon (a joint effort that would bear fruit after World War II in things like the publication of the Adams family papers), young scholars were professionalizing local history as a way of finding their primary materials locally. There were, to be sure, strategies for overcoming local scarcities. Hicks (1968, 140) reports taking summer teaching jobs at places like Harvard, George Washington, and Northwestern as a way to visit the great library cities and get paid for it. But in general, access drove use: scholars who could not access certain kinds of materials simply shifted their practices and indeed the topics of their scholarship.

All the same, the interwar period saw considerable leveling of the library playing field, largely through increased spending and the inevitable leveling in terms of deposited government documents. This effect was especially pronounced in the social sciences, dependent as they tended to be on more recent material. The great collections maintained and even increased their lead in materials spending, but workers in second-tier libraries could now count on core staffs, reference collections, and a much stronger interlibrary infrastructure to identify and locate materials unavailable locally. Second-tier cities began to develop their own union lists to mimic the astounding richness of the library scenes in Boston, New York, and Chicago.

A facilitator of this new leveling was the proliferation of reproduction technologies. Here too there was extensive collaboration—in securing copies of canonical sources from Europe, for example—although there was also a good deal of local photostating and copying (Putnam 1929, 697). At the close of the interwar period came microfilm, which, although it did not quite initiate the revolution expected, did enable the exchange of large amounts of material over great distances at relatively small price.

Although embedded in all these rich resources, the library scholar of the interwar era nonetheless still faced a finite literature. Reporting on scholarly publishing for the year 1927, Donald Bean found 352 new scholarly books (excluding texts) in the humanities and 428 in the social sciences. There were about twenty-five to thirty scholarly periodicals in big fields like history, literature, and economics, about fifteen to twenty in smaller fields like sociology, political science, and anthropology, and about five in tiny

fields like archeology and philosophy.¹⁶ One can calculate from his figures (1929, 11–12) that in most HSS fields a scholar could read everything published in his entire field by reading about five hundred to seven hundred pages a week. In reality, reading rates were no doubt lower, but a complete command of most or all of the ongoing research in his subfield was easily within the reach of any active scholar in this period.

The Postwar Era

Core Infrastructure

The core infrastructure continued its evolution and consolidation in the postwar era. The *International Index (II)* remained a major source for periodical bibliography, and in the mid-1950s Wilson accepted the academization of America and moved the disciplinary flagship journals like the *American Historical Review* and the *Journal of Political Economy* out of the *Reader's Guide* and into the *II*. Nonetheless, although by this time the *II* was indexing about 175 journals, many established disciplinary journals were beneath the *II* radar screen. In practice, the *PAIS Bulletin* was a more effective index for the social sciences (Advisory Committee 1950; Quinn 1951, 48). And fields as important as musicology and philosophy received ongoing specialized periodical indexes only in 1949 and 1967, respectively. Moreover, as Europe recovered from war, there was a broader universe to be indexed; UNESCO's *International Bibliography* series engaged sociology (1951), economics (1952), history of religions (1952), political science (1953), and anthropology (1955), covering a wide variety of work in multiple languages.

In the postwar period abstracting and review essays finally spread to library research fields. *Sociological Abstracts* began in 1952, although lack of cumulation hampered its utility for many decades. *Historical Abstracts* began in 1955, with American history splitting off in 1964, and the twentieth century becoming a separate tool in 1971. Economics possessed abstracting journals fitfully in the 1950s before the *Journal of Economic Literature*

16. See also Stock 1928. Comparing his own figures on scholarly society membership with publishing data, Bean found that the various humanities and social sciences typically have one journal per 100–150 members. There was a new scholarly book for every 20–30 members across the various fields. Both figures are within the order of magnitude of current figures. For example, the American Sociological Association has about 13,000 members and the Institute for Scientific Information counts ninety-three sociology journals in its data base, one per 140 members.

emerged in 1969 as a permanent bibliographical tool. Anthropology had a *Biennial Review* from 1959 to 1971. *International Political Science Abstracts* dates from 1951. Equivalent humanistic tools were less forthcoming. To be sure, the MLA's *American Bibliography* internationalized into the far more comprehensive *MLA International Bibliography of Books and Articles on the Modern Languages and Literatures* in the mid-1950s. But although *Abstracts in English Studies* appeared from 1958, it abstracted only articles on literature, from about 190 periodicals, and lacked both cumulation and good indexing. *Philosophic Abstracts* ran from 1939 to 1954 and folded. An *Index to Religious Periodical Literature* finally began in the early 1950s, and a *Religious and Theological Abstracts* in 1958.

Abstracts were to some extent a sign that the periodical literature had begun to seem overwhelming, even if the number of journals indexed in *II* stayed close to Bean's listing of 154. Moreover, not only were there more articles to read, but they were also now much easier to find. Postwar library researchers basked in a vastly expanded edition of the *Union List* (1943), containing the records of about 115,000 titles in 620 libraries. Every state was now represented, thirty-two states by five or more contributing libraries and eighteen by ten or more. To be sure, one-third of the contributing libraries were in eight major cities, but the periodical system was far more effectively national. From 1953 onward, there was a running union list of new titles (*New Serial Titles*).

The 1943 edition of the *Union List of Serials* was complemented by three other union lists, all produced on the same model (and by ALA-Wilson cooperation) toward the end of the interwar period: the *List of Serial Publications of Foreign Governments, 1815-1931* (1932), *American Newspapers, 1821-1936* (1937), and *International Congresses and Conferences* (1938) (see Zubatsky 1982, chap. 6). Other important tools of general bibliography dating from the end of the interwar era were Ulrich's periodicals directory (1932), the *Deutsche Gesamtkatalog* (fourteen volumes by 1939), Wilson's *Bibliographic Index* (1938), and Besterman's monumental *World Bibliography of Bibliographies* (1939), which grew to 65,000 entries in 1949 and 117,000 in 1966. All in all, the core bibliographical tools of the postwar era could find for a scholar far more work than he could possibly read and evaluate.

The postwar period also saw a revolution in book bibliography. The Bowker firm's *Publishers Trade List Annual* (PTLA), an annual, bound collection of publishers' catalogs, which began publication in the nineteenth century, was simplified into the author-title *Books in Print* (1948), which in 1957 finally got a subject index. The British equivalent, *British National Bibliography* (BNB), emerged in 1950. These meant far more effective subject

access to current materials than had been available before, an important tool for scholars.

But retrospective bibliography also saw a revolution. By the end of the interwar period, the forty scattered LC depository catalogs, although fairly heavily used (by library staff, not faculty—see Munson 1946, 44), were increasingly expensive both in space and in maintenance. Moreover, smaller libraries had no access to them. Yet the NUC was crucial to scholarship: about 14 percent of NUC holdings were not in LC (Lewis 1985, 33), which meant that LC itself could not serve as a default “library with everything.” The result was the printing, completed in 1946, of the 167-volume *Catalog of Books Represented by Library of Congress Printed Cards (CBR)*, containing a little under two million cards, essentially a copy of the most complete (LC) depository catalog. The *CBR* sold widely: 216 educational institutions bought a copy, including not only the major research libraries but also small colleges, state colleges, and lesser universities (Lewis 1985, 142). The *CBR* contained very little locational information, but it brought an enormous portion of national bibliography within the reach of a much larger group of faculties than had previously had access to it.¹⁷

The *CBR* also had a huge demonstration effect. Its publication format of multiple slightly reduced cards printed in columns on a page proved enticing, and in the late 1950s the G. K. Hall firm embarked on a profitable career of publishing the catalogs (usually author-title but sometimes subjects as well) of dozens of important libraries and specialized collections. Among the early takers were great special collections like the New York Public Library’s Oriental (1960) and Jewish (1960) collections, as well as the American Geographical Society (1962). Hall also published specialized tools like the New York Public Library’s subject headings (five volumes, 1959) and the Chicago Art Institute’s *Index to Art Periodicals* (eleven volumes, 1962). The 1960s would bring much larger catalogs, running to dozens of volumes, often from libraries outside the university orbit: the Peabody Museum (fifty-three volumes, 1963), London’s celebrated School of Oriental and African Studies (twenty-eight volumes, 1963), the U.S. Geo-

17. The *Union List of Serials* symbolized a much wider movement for union lists of all kinds. By 1942 there were regional union catalogs for states like California and New Jersey, for regions like the Chapel Hill and the Philadelphia metropolitan area, for subject areas (*The Howard University Union Catalog of Titles by and about the Negro*), for area-subject combinations (*The Boston Medical Library Union List of Medical Literature in Massachusetts Libraries*), and so on. In addition to these were the forty distributed copies of the *Library of Congress Depository Catalog*. Every major university library in the United States (and such smaller schools as Bowdoin and Dartmouth) had such a catalog, which would have been the anchor of its interlibrary loan system.

logical Survey (twenty-five volumes, 1964), the U.S. Department of Health, Education, and Welfare (twenty-nine volumes, 1965), the John Crerar Library (seventy-seven volumes, 1967), and the New York Academy of Medicine (seventy-seven volumes, 1969). (For a complete bibliography, see Nelson 1982.) These were truly astounding tools for scholarship.

The CBR also indirectly helped researchers by reinforcing the continuing drift of major research libraries to the LC classification system (see Tauber and Feinberg 1974). This process had been steadily under way since the mid-1930s, following the demonstrated success of early adopters like Chicago and Michigan. By the mid-1970s, a survey found that 90 percent of American and Canadian university libraries that contained over 500,000 volumes used the LC system (Michael 1976).

Archives also became steadily more locatable through the postwar period. The Historical Records Survey had done a vast amount of work at the end of the interwar period, producing the dozens of volumes of the *Inventory of Federal Archives in the States*. On such a basis, tools like Billington's "Guides to American History Manuscript Collections in Libraries of the United States" (1952) became possible. Then in 1959 came the first volume of the *National Union Catalogue of Manuscript Collections*, which had been planned since the 1930s by committees of the AHA, the Society of American Archivists, and the American Association for State and Local History (see Billington 1952). The first volume described 7,300 manuscript collections in 400 repositories. Annual volumes (occasionally cumulated over longer intervals) brought this total to 29,350 collections in 850 repositories by the end of 1971. Such tools were heavily used by scholars. Government documents, by contrast, limped along through the postwar era with the awkward *Monthly Catalog* and its occasional cumulations.

As for other materials, *Doctoral Dissertations Accepted by American Universities* dates from the late interwar period (1933). *Microfilm Abstracts*, the ancestor of *Dissertation Abstracts* (1952) and University Microfilms, began in 1938. Although *Dissertation Abstracts* increased its coverage steadily, a fatal weakness remained: of the five midcentury doctoral giants, Berkeley, Chicago, and Harvard remained outside *Dissertation Abstracts* as of 1960. More disturbing, careful citation surveys of social scientific work in the 1950s show that dissertations were seldom cited in published work, constituting only 1 percent of all citations in political science and sociology and considerably less than that in economics.¹⁸ A JSTOR search of all PMLA article

18. The studies involved are McAnally 1951; Meyer 1951; Quinn 1951; Martin 1952; Livesay 1953; Mark 1956. Jesse Shera, then professor in the University of Chicago Library School,

texts finds the word "dissertation" in 14 percent of all articles in the two decades 1901–20, 11 percent in 1921–40, 8 percent in 1941–60, and 6 percent in 1961–80. To be sure, almost 10 percent of all interlibrary loan requests in the late postwar period were for dissertations and theses, running to perhaps 100,000 requests per year (Palmour et al. 1972, 44; Thomson 1970, 26). But this was nothing compared to the vast use of monographs and serials nationwide. A 1956 census of all materials circulated to faculty at Chicago, where library copies of dissertations circulated routinely, found that dissertations were only 0.9 percent of circulation in the humanities division and 3.8 percent in the social sciences division (Sheniti 1960, 62). The rapidly improving tool was thus serving a vanishing market; scholars seemed to be assuming that all work of quality and importance would be published (see McAnally 1951, 50).

Specialized Reference Tools

In the postwar era, specialized reference tools continued their rise and domination of library research practice. Already in 1944 an exacting study of sources for library materials in dissertations in English literature showed the overwhelming advantage of specialist-created research tools like the *Cambridge Bibliography of English Literature* over the catalog and general subject classification systems: "The process of bibliography is more purposeful and realistic than that of cataloging and classification. The bibliographer . . . begins with a subject and asks what books are related to it. The cataloger begins with a book and asks what subjects are related to it" (Swank 1945, 67). The strength of these specialist-created tools lay in their highly focused nature. *Current Sociology* (from 1952) devoted each whole issue to a monograph and bibliography of some specific area within sociology, written by a specialist. In the early 1950s there were three separate ongoing bibliographies covering parts of philosophy. In literature, the Tannenbaum *Elizabethan Bibliographies* series (1937–47) covered each minor figure with fifty pages of bibliography and each major figure with many more; individual plays of Shakespeare could command one hundred or more pages. Indeed, in Sheehy's 1976 ninth edition of the *Guide to Reference Works*, the whole category of "Guides" to particular minor authors was cut because these had become so plentiful during the postwar era (Sheehy 1976, 334). By 1964, specialist reference sources in the social sciences were so extensive that they

supervised these studies as part of a project to decide whether to store part of the Chicago collection.

required a five-hundred-page guide of their own (White 1964). It seems, in summary, that the postwar period saw an extraordinary flowering of highly specialized reference tools.

The Habitus of Scholarship

This immense flowering of specialist tools was part of a great sea change in academia. After the war, five years' worth of pent-up demand for graduate education—aided by GI Bill funding and powered by anticipation of jobs teaching other former GIs—transformed the academic world. As table 1.3 shows, the library-based scholarly societies grew from about 15,000 members in 1945 to over 72,000 in 1970.¹⁹ The high PhD “birthrate” balanced with falling mortality rates to keep the age of the researcher pool stable at around forty years (thirteen years post-PhD), until the 1960s bubble finally pushed it down to thirty-seven around 1970 (see table 1.1). And in this period the PhD finally became the modal degree for the university system, although expansion of the state college and related systems kept HSS PhDs from increasing their total proportion of all faculty in higher education.

Centralization of graduate education finally began to decline in the postwar era. So also did the geographical centralization of certain kinds of library resources, particularly government documents and core research periodicals; such resources were now available at many more universities. However, library staff sizes per volume tended also to decline; there were more materials but to some extent less help with them.

For the scholars themselves, the postwar era was a new world: on the one hand, a world of high expectations, maintained by a buoyant job market; on the other, a world of relentless specialization, of proliferating sections within associations and indeed of separate subsocieties. Broad knowledge of dissertation work in progress was impossible; only via specialization could one retain a grasp of new doctoral work. To the extent that fields had delimited objects of study, dissertation topics were exhausted at a heroic pace. An implication of this overload was that disciplines lost contact not only across the broad range of their subfields but also with their own pasts. On the one hand, a rhetoric of progress entailed ignoring the past;

19. As many dissertations were written between 1945 and 1956 as had been written from 1890 to 1945, and as many were written between 1956 and 1968 as had been written to 1956. Note, however, that while postwar expansion was sudden, the *rate* of expansion steadily slowed in the postwar period until the search for military deferments created the PhD bubble of the 1960s. The slowing expansion may indicate that PhDs were already being driven out of academia by oversupply in the 1960s.

on the other, exponential growth meant that most of the work available to be read was in fact recent work. By the mid-1970s, with most disciplines producing more than four hundred PhDs per year, even first-order specialization was not really an option. Complete command even of a subfield was impossible.

To be sure, it appears that the total amount published remained proportional to the number of scholars. Following the procedures of Stock (1928), Bowker (1945) found 238 journals at the beginning of the period, again very close to the one journal per 100–150 scholars observed both by Bean (1929) and at present. But given the heroically increased numbers, even constant output rates produced a flood of material. It is therefore no surprise that there began to be complaints about scholarly overload and the loss of knowledge through sheer welter.

This was in part a structurally induced complaint, since the librarians thought that the answer to the problem was “better access” or “more effective bibliographical control.” Better access tools—which inevitably made scholars happier, particularly at peripheral universities—in practice just meant access to more material, which in turn increased the problem of welter. Surprisingly, selective tools did not in general flourish. Specialty journals carried many book reviews, but a well-funded national attempt at a selective cross-disciplinary book review journal failed in the mid-1950s after a ten-year run (*United States Quarterly Book List*, 1944–56; the non-scholarly literature had had Wilson’s *Book Review Digest* since 1905).

In this period scholars came to rely almost completely on specialist resources—both specialized reference works and the specialty scholarly literature itself—for their basic bibliography. They used the librarians’ core infrastructure only in case of a failure somewhere along a chain of references or when searching for the rarest of materials (see Kraeling 1951, 111–14). Otherwise, they ignored the “view from nowhere” subject indexing of the librarians, however detailed it might be (Hazen 1952; Altick 1954).

The evidence for this change is overwhelming. A 1946 Chicago study found social science graduate students relying for bibliography on reading lists and article reference lists but only occasionally on periodical indexes (Brown 1946). A 1952 study of patron bibliographical sources at the John Crerar Library found that standardized indexes provided only 20 percent of the references and that those with MAs or higher degrees found over half of their references in the footnotes of periodicals or books (Williams 1952). The 1956 ALA Catalog Use study found indexing and abstracting journals almost never cited as bibliographical sources by faculty or graduate students: footnote or chapter bibliographies and hearsay dominated,

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73

although graduate students did admit to using professors' bibliographies (Jackson 1958, 26). A detailed Johns Hopkins survey in 1962 showed that even when HSS faculty and graduate students were engaged in known-item search, they pursued it only half the time through an author-title catalog but fully a quarter of the time through simple stack browsing. Subject catalogs and subject searches—for librarians their key contribution to knowledge access—were almost never used.²⁰ In a 1961 Chicago study, 169 people in the stacks—90 percent of them faculty or graduate students—reported the use of five hundred books total, of which fewer than a third were identified by call numbers ahead of time. A quarter were picked “because I was looking for a book of this general nature,” and almost 20 percent through casual or systematic browsing. Of the books said to be “of some or great value,” fully 43 percent were found by browsing of one sort or another (Bowen 1961). An item-based study by Chicago's librarians (Fussler and Simon 1961, chap. 8) was clearly embarrassed by the levels of browsing use found and in fact systematically misinterpreted its results to favor the librarians' preferred strategy of storage of “unused materials,” on the ground of “what every good scholar knows [*sic*]: browsing alone cannot serve as a satisfactory basis for a serious literature search” (Fussler and Simon 1961, 205).

The didacticism of this last remark pervades the library literature of the period, in which the unwillingness of faculty to consult librarians' subject indexes became a standing joke (Hitchcock 1962, 10). Librarians in this period dreamed of the ultimate subject index, in part because they believed such an index would justify their relegating rarely used materials to storage.²¹ In this, librarians of the postwar period were heavily influenced by indexing and abstracting in the natural sciences, both because of their apparent success in serving need and because the rapid obsolescence of scientific collections made storage an obvious and acceptable strategy for space problems. (See, e.g., the essays of Shera, Tauber, Henkle, and Fussler in Shera and Egan 1951.)

In their unscientific way, library researchers continued to spend much

20. I recalculated these figures from the raw data in Johns Hopkins University Research Library 1963, 89–91.

21. The belief that accurate subject indexing would overcome the scholarly problems created by storage drove the wonderfully detailed Chicago citation studies. The otherwise inexplicable focus on whether or not citations gave actual page numbers reflected Jesse Shera's desire to ascertain the minimal indexing unit. That that unit proved smaller than the article spelled disaster for the storage project, because such indexing was unaffordable. Library research scholars' desertion of the core bibliographical apparatus has been rediscovered in the information science literature since 1970, condemned by its own ignorance of history to imagine this an important new discovery. See, e.g., Stone 1982 and Watson-Boone 1994.

time in the library, although not as much as before the war. A Michigan survey in 1961 found that 40 percent of nonpsychology social scientists and 50 percent of English faculty reported using the library more than once a week. But at the same time, 50 percent of the faculty in social sciences and 40 percent of the English faculty said that their book and journal needs were completely or to a great extent satisfied by sources other than the university library, chiefly by their own or colleagues' personal collections (Survey Research Center 1951, 8–11). A crucial factor here was the sudden expansion of paperback publishing both in the trade world (Doubleday Anchor [1953], Knopf-Vintage [1954], Viking Paperbound [1955], Oxford Galaxy [1956]) and in the university press world (Cornell Great Seal [1955], Chicago Phoenix [1956], California [1956]). In many cases these were backlist titles, but new material was published as well (Schick 1958). As professors' own holdings expanded, the library became more than ever of importance to them precisely for its rarely used materials, even as librarians became increasingly interested in sending those very materials to storage.

The center of the dispute—recognized by only a few at the time—was historical research. The only scholars who needed truly gargantuan libraries were those—whatever their discipline—for whose work library material had historical, as opposed to substantive, value. Obsolescent research, ephemera, worthless screeds: librarians would happily throw them all away to make room for new material. But the historians often wanted just that material. “There is only one type of research—historical research—for which the flood of print does constitute a problem, not because it uses all of recorded knowledge but because it never knows what part of such records it may have to use” (Taube 1942, 247–48). Indeed, it is likely that the gradual leveling of academic libraries—in government documents, core periodicals, and materials expenditures—exacerbated this fact. All these forces meant that current holdings were much more uniform systemwide, which in turn made many of the social scientists and even a considerable number of humanists satisfied with the libraries they found as they scattered out of the elite library cities.²² But for historical researchers, the sheer volume of

22. Another sign of equalization was the fact that librarians had given up on cooperation in acquisitions. This had been a major librarian theme in the interwar era (e.g., Bishop 1926, 223–25; Works 1927, chap. 3), along with the correlative idea that libraries and indeed research faculties should specialize. In the postwar era, librarians, like everyone else, expected all universities—and their libraries—to be excellent in all areas. The postwar period also saw a rapid decline in the importance of the nonuniversity libraries, with the conspicuous exceptions of LC and the New York Public Library. In 1958 a quarter of the business at the John Crerar Library was fulfilling photocopy orders sent in from elsewhere—essentially a depository function (McGeever 1958, 21).

resources remained crucial. A careful study in the postwar era showed that historical dissertations were extreme on every dimension by comparison with "textual" or "experimental" ones: by an order of magnitude, they used more library material, more library material than no one else had used, and more material not in the local library.²³

The Implosion Era

Demography

Since the implosion period is defined by a demographic transition, we must start with demography. In the mid-1970s, market saturation and fiscal crisis halted the founding of new colleges and universities. Existing universities stopped hiring. The academic job market consequently died just as a flood of Vietnam War-induced PhDs finished graduate school. In the resulting catastrophe, as many as a third of new PhDs could not find academic jobs. Social science PhD production fell by nearly one-third, as did PhDs in language and letters (fig. 1.1). The crisis in PhD birthrates produced an eerie stability: the number of library-based academics remained around 80,000 until the mid-1990s finally brought new growth (table 1.3). Consequently, the average age of researchers rose steadily throughout this period, to nearly forty-five by 1996, the last year for which there is fully comparable data (table 1.1). The demographically dynamic academia of the postwar period was thus replaced by an almost immobile one during the implosion years.

A hidden consequence of the aging of academia seems to have been a decline in reading. The heaviest readers for academic work are graduate students and young faculty. Older faculty have disciplinary, professional, and administrative obligations that command much of their time. When academia ages rapidly, then, the proportion of all scholars who are active readers declines sharply. This seems to have happened in the implosion period.²⁴

23. Surveying one hundred dissertations across three institutions and five fields (history, classics, education, botany, and psychology), Stevens (1951, 1953) divided them into historical, textual, and experimental. Historical dissertations typically cited a hundred or more titles uncited by any other dissertation in this list and over sixty titles not in the local library. Experimental dissertations, by contrast, typically cited only seventeen unique items and four non-local ones.

24. Reading in academics is in many ways a Ponzi scheme; young scholars read the work of their advisers, the work of those who influenced their advisers, and so on back to the "classics." "Reading the work of someone" is thus strictly analogous to sending five dollars to the list of

An empirical indication of this sharp change is the end of specific citation. Today's HSS journals contain very few citations to particular pages within cited items, even when those items are large books. But detailed citation studies from the early 1950s show that at that time typically a third or more of all citations involved unique pages, and two-thirds involved at least some specific page range of the cited text. The decline of such specific citation must have reflected at least in part a decline in direct engagement with particular sources, whether this meant less careful initial reading or unwillingness to return to a source after writing to specify the exact location of one's dependence on it.²⁵

The implosion period's buyer's market enabled a rapid rise in academic standards outside elite institutions. This upgrading put a new premium on publication. To be sure, the ratio of journals to discipline numbers was roughly the same in the late 1970s as in the figures of Bean and Stock in the 1920s and of Bowker in the 1940s.²⁶ But the absolute numbers were much greater and the sheer welter of material was mind-numbing. In the quantitative sciences, meta-analysis emerged as a statistical technique for reducing dozens of incommensurable studies to a comprehensible set of findings. There was no equivalent for the library researchers.

Core Infrastructure

Ironically, now that the core infrastructure was less central to research, it reached its apogee. In periodicals bibliography, the implosion period brought at last the long-heralded indexes to everything. The year 1965 saw the publication of the final (third) edition of the *Union List of Serials*, covering all periodicals published prior to 1949 and detailing the holdings of 156,000 titles in about a thousand libraries. Eight years later, *New Serial Titles* was cumulated for the period 1950–70, bringing comprehensive peri-

people on a chain letter. When demographic forces raised the average age of scholars by ten years during the implosion era, the Ponzi scheme collapsed.

25. For the citation data, see the studies cited at note 18. An indication of how seriously scholars took getting their facts right is the existence of professional citation checkers. For an autobiography of one such person, see Rowe 1939.

26. This calculation assumes that ISI reached as deep into the pool of possibilities as did its predecessor: that is, the existence of journals is measured by their being indexed in the ISI. On that assumption (and using the table 1.3 figures) the numbers of scholars per journal for the (Bean) social sciences (in 1975) are 124 for anthropology, 99 for sociology, 131 for political science, and 155 for economics. In the (Bean) humanities (for 1980, in order to let the coverage stabilize) the figures are 63 for philosophy, 85 for history, and 128 for literature. Machlup and Leeson's (1978, 22) numbers of journals (for 1973) are considerably lower (and the ratios correspondingly higher), but they involve only American journals, unlike ISI.

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77

odical bibliography and location to within three years of the then present. Finally and most important, the Institute for Scientific Information (ISI) transferred its decade-old "citation index" format from the natural sciences to the social sciences (Social Science Citation Index [SSCI]—1973) and to the arts and humanities (Arts and Humanities Citation Index [AHCI]—1978). Although mainly touted for their power to follow bibliographical chains through citation links, these two tools introduced en passant a new, pared-down version of periodical indexing to compete with the longstanding Wilson tools, which by now had split into *Humanities Index* and *Social Sciences Index*. ISI called its system Permuterm Indexing, for it consisted of a listing of every pair of substantives in every title of the source articles. (The standard name for it was Keyword-in-Context-Indexing [KWIC].) The low cost of the ISI format meant that its coverage could be wide and easily expanded. In 1975/76, *Humanities Index* was indexing 257 journals while AHCI was indexing 963. The comparable figures for *Social Sciences Index* and SSCI were 272 and 1,517.²⁷

The revolution came in books as well. The 685-volume *National Union Catalogue, Pre-1956 Imprints* was completed in 1980, after twelve years. Unlike its predecessor, the *CBR*, the *NUC Pre-1956* contained all the locational information on the NUC cards; many items were located to dozens of libraries. Librarians could realize at last their dream of ultimate democracy: everybody would have rapid access to everything. At the same time, the interlibrary loan burden on the major collections would be lightened.

Even government documents and archives reached new levels. A cumulative index to the *Monthly Catalog* appeared in 1973–75, and the Congressional Information Service released through the 1980s a set of massive historical indexes of the entire Serial Set. (Still outside, unfortunately, were the millions of documents not in the Serial Set; astonishingly, sources like Poore's *Descriptive Catalogue* [1885], Ames's *Comprehensive Index* [1905], and the *Document Catalog* [1893–1940] remained important indexes well into the implosion era.) Even archives got into the act. The *National Union Catalogue of Manuscript Collections* got a cumulative personal-name index in 1988.

But these tools, while supremely powerful, were in fact only rarely relevant to the research process. Library researchers utilized them in extremis,

27. Stevens 1974 is a good review of the indexing situation at the time. Despite a great deal of computing advance, we are more or less in the same place today, having the same debates. KWIC/KWOC indexing has largely triumphed over controlled vocabulary indexing, no doubt on cost grounds. For a history of KWIC indexing, see Fischer 1966. Like several other important librarian innovations, it saw its first major use in chemistry.

having long since turned for their everyday work to more focused, specialty-produced reference tools. Indeed, even the librarians succumbed to specialization. The eleventh edition of the *ALA Guide to Reference Works* gave up at last on the notion of a single editor; fifty subject specialty librarians contributed individual sections, while Editor Robert Balay was merely a collator. Most of these individual sections were larger than the entire first edition of the *Guide to Reference Works*.

The Habitus of Scholarship

I have already underscored the demographic conditions of the implosion period. Academia was large. Single disciplines had as many or more researchers than all of academia had in the interwar period. Publication rates were as high or perhaps even higher per researcher than they had been throughout the century, with a resulting flood of material. The central fact of the research habitus of this period was thus overload. In 1970 there were fifty-three university libraries bigger than the Harvard library in 1914. Inter-library loan in the 1970s ran to over a million items, and that was only the number of fulfilled requests: items requested were probably double that figure (Palmour et al. 1972, 52). Annual acquisitions in large ARL libraries typically ran about 200,000 items, roughly three times what they had been twenty years before.

What this meant within disciplines can be easily imagined. The *American Sociological Review* reviewed one hundred books in 1950. By 1972 the sociologists had a separate book review journal (*Contemporary Sociology*), which was reviewing over three times as many books. In its first year (1952/53) *Sociological Abstracts* produced 586 abstracts from 17 fully covered and 24 partially covered journals. Twenty years later (1972) it was producing 7,317 abstracts (5,050 of English-language materials), from 129 full-indexed journals, several hundreds of partially or occasionally indexed journals, and dozens of society meetings. Sociology produced on average of 161 PhDs per year during the 1950s but 654 PhDs per year between 1971 and 1976.

In every discipline the facts were the same. During the postwar period, specialization seems to have been the chief means of dealing with overload. Disciplines kept some semblance of unity by retaining a somewhat arbitrary core of canonical works. It was in this epoch, for example, that sociology began to treat Max Weber and Emile Durkheim as if they represented the entire corpus of European social theory. That this was not in

the least true did not lessen the utility of having a few core texts to bind together an exploding and fragmenting discipline.

The canon/specialization means of integrating disciplines was, however, exhausted by the beginning of the implosion era, because in the last analysis most of the forms of HSS knowledge do not take well to specialization. What seem to have replaced specialization (even beyond the library-based areas of HSS) were what I have elsewhere (Abbott 2001, 25ff., 148ff.) called “generational paradigms”: groups of scholars who created their own conventional subcanons, allied themselves to certain methodologies, and attacked somewhat conventionalized problems. These paradigms would evolve for twenty years or so before being replaced by other paradigms with other subcanons, methodologies, and conventionalized problems.

With respect to library research, generational paradigms solved the problem of welter by means of conventional choices of important sources. But while this helped to some extent, other aspects of the library research habitus seem in this period to have headed toward breakdown. For example, the number of citations in a given article multiplied by an order of magnitude, most of the change coming in the 1970s. This change was likely driven by technology (the citation indexes provided a much larger range of potential material to cite, and word processors made it easy to copy references from older papers), by double-blind reviewing (which encouraged the citation of any possible reviewer), and by the need to signal membership in generational paradigms and other disciplinary subcommunities.²⁸ In terms of library research practice, this multiplication of references must have had important effects, because as we have seen, library research scholars get most of their bibliography from other people’s reference lists. The newly padded reference lists made bibliographical work harder because they suppressed quality selection. The fifty-page “Bibliographical Essays” that completed many new historical monographs were the equivalent in books.

It is also true that in the library system earlier in the twentieth century, availability—at least for secondary materials—had in fact been a proxy for quality. The books and journals unavailable in a given field in a given library were of lower average quality than those that were available. To a cer-

28. The ballooning of reference lists is so familiar as to need no data. See, e.g., Abbott 1999, 167. For an example, the fifty articles in the *American Journal of Sociology* in 1960 had a median of fifteen references; the thirty articles in 2005 had a median of seventy-four references. Double-blind reviewing—which no doubt drove much of this—began in the mid-postwar era in sociology and other social sciences (Abbott 1999, 144–47). It started in humanities journals somewhat later.

tain extent, this was, of course, a self-fulfilling prophecy, but the incentives of authors, subscribers, librarians, editors, and publishers all dovetailed to make it true a priori. Other factors intervened, to be sure. But certainly for the English-language literature, breadth of availability correlated fairly strongly with quality. As a result, increased access usually meant not only more material to evaluate but also a disproportionately greater need for selectivity.

All these factors suggest that in the implosion period, the library research system lurched into breakdown. Many of the traditional mechanisms for dealing with overload were incapable of handling the vast mass of material. Even subspecialties were large and faceless. PhD production was decentralized and uneven. Reading and other detailed engagements with texts seemed in decline. Meanwhile, the core research infrastructure was more inclusive and less selective than ever. General availability weakened a longstanding proxy for quality. And even specialized practices like pillaging colleagues' reference lists had become substantially less effective. There was more and more stuff and less and less way to make sense of it. Indeed, the very notions of knowledge quality and progressive cumulation seemed to need recasting in the context of the implosion era library research system.

Conclusion

In summary, the library research system that evolved in twentieth-century America contained a powerful and differentiated set of tools and practices. To a considerable extent, librarians and scholars collaborated to build a system that was extraordinarily effective at identifying and finding material locally, as well as at finding material elsewhere if need be. But despite their collaboration, the librarians and the scholars drifted steadily apart; two very different visions of knowledge emerged.

The first was that of the librarians. Librarians saw the researchers as only one among their clientele. While that clientele was obviously the chief reason for immense library budgets, librarians also served undergraduates, who seemed a more needy—and certainly more numerous—group of users. Moreover, librarians saw themselves as the voice of centralized good sense against the irrationally self-serving demands of particular researcher communities. They thus pursued a vision of universal knowledge, knowledge without specialization, knowledge potentially available to everyone.

With respect to research users in particular, librarians' goal from the 1920s onward was a democratic, universal system in which any scholar

would have some kind of access to everything in the library research system nationwide. There were three parts to this project: identification, location, and physical access itself. For identification, librarians proposed the universal index. Subject indexing, within controlled vocabularies like the LC or Wilson headings, would identify needed materials. Since librarian ideology prevented selectivity, in practice such indexes steadily extended their coverage and detail, factors that combined with the steady expansion of academia itself to make them enormous and ultimately less useful. For location, librarians produced local card catalogs of varying quality and a large collection of union lists, archive indexes, and other locational tools, relying in the last analysis on LC. It is clear that the interuniversity aspect of this system was an immense success throughout the century. Library scholarship was inconceivable without it.

As for the third issue, physical access, the librarians shaped both local and interuniversity access decisively. Locally, they centralized all materials early in the century, destroying the original library research habitus and unwittingly fueling the explosion of specialized reference and bibliographical tools. Between libraries, they created a jury-rigged access system that relied on interlibrary loans, microfilm, and other forms of duplication. Funding this system was a problem, because the weight of it fell overwhelmingly on a few great collections. At times it did not work very well, and it broke down completely under the immense pressures of the implosion period.

Scholars pursued a quite different project. Their aim was the actual creation of knowledge, but unlike the librarians this was particular and actual knowledge, not generic and potential knowledge. They too were concerned with identification, location, and physical access. But their identification practices were always rooted in each other's work. They dropped out of the "universal index" project almost at the start, preferring to identify their materials through the work of other specialists. They built and staffed specialty-internal tools from the 1920s onward. Moreover, they did a surprising amount of their identification by random search: browsing in the stacks, brute-force trolling in ranges of documentary materials, and so on. By contrast with this reliance on specialty tools and trolling for identification, however, for *location* they were much more reliant on the librarians' system.

In terms of physical access, the scholars again dissented from the librarian system. For one thing, they often let physical access drive use. That is, they often started with access rather than with identification. This was the origin of the new social history with its roots in local archives. Moreover, they often bypassed the interlibrary loan system, preferring to take them-

selves to sources located elsewhere (partly in order to browse or troll them) rather than calling the materials to their local library. Like the scholars' identification practices, these were designed to optimize the productivity of the research hour rather than to embody, as did the librarians' approach, an abstract model of the process of scholarship.

The scholars also remodeled their social structures to deal with the problem of welter. They dealt with quantity by creating disciplines, then specialized subdisciplines, then generational paradigms. All of these constituted somewhat arbitrary limitations on the kinds of things researchers had to know in order to conduct their work, reducing the task of identification to a feasible size.

The story of twentieth-century library research infrastructure is thus the story of the failure of a universalist approach to knowledge, the failure of a knowledge-from-nowhere. Successful forms of library-based knowledge were built on somewhat arbitrary limitations (what the librarians called "narrow specialism") that permitted the creation of highly specified and selective identification tools, which in turn allowed the purposive scanning of extremely sparse primary sources that would otherwise have yielded nothing. The librarians' much-vaunted universalist project turned out to be appropriate only for neophytes. Real knowledge could be produced only by communities that took a view "from somewhere," that embraced what seemed like forms of bias and even systematic blindness in order to permit exploration of the immense record of human endeavor. Like Odin, the researchers gave up an eye in exchange for the ability to see clearly.

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