THE SECOND VATICAN COUNCIL AND AMERICAN CATHOLIC THEOLOGICAL RESEARCH: A BIBLIOMETRIC ANALYSIS OF THEOLOGICAL STUDIES: 1940-1995

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Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August 2000

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Phelps, Helen Stegall, The Second Vatican Council and American Catholic theological research: A bibliometric analysis of *Theological Studies*: 1940-1995. Doctor of Philosophy (Information Science), August 2000, 147 pp., 55 Tables, 6 illustrations, bibliography, 110 titles.

A descriptive analysis was given of the characteristics of the authors and citations of the articles in the journal Theological Studies from 1940-1995. Data was gathered on the institutional affiliation, geographic location, occupation, and gender and personal characteristics of the author. The citation characteristics were examined for the cited authors, date and age of the citations, format, language, place of publication, and journal titles. These characteristics were compared to the time-period before and after the Second Vatican Council in order to detect any changes that might have occurred in the characteristics after certain recommendations by the council were made to theologians. Subject dispersion of the literature was also analyzed. Lotka's Law of author productivity and Bradford's Law of title dispersion were also performed for this literature.

The profile of the characteristics of the authors showed that the articles published by women and laypersons has increased since the recommendations of the council. The data had a good fit to Lotka's Law for the pre-Vatican II time period but not for the period after Vatican II. The data was a good fit to Bradford's Law for the predicted number of journals in the nucleus and Zone 2, but the observed number of journals in Zone 3 was higher than predicted for all time-periods.

Subject dispersion of research from disciplines other than theology is low but

citation to works from the fields of education, psychology, social sciences, and science has increased since Vatican II.

The results of the analysis of the characteristics of the citations showed that there was no significant change in the age, format and languages used, or the geographic location of the publisher of the cited works after Vatican II. Citation characteristics showed that authors prefer research from monographs published in English and in U.S. locations for all time-periods. Research from the disciplines of education, psychology, science and the social sciences has increased, but authors preferred the use of theological sources for their research more than 70% of the time both before and after the council.

ACKNOWLEDGMENTS

The author gratefully acknowledges the encouragement and support of the members of her committee, especially Dr. Ana Cleveland for her guidance and valuable suggestions, and Dr. Donald Cleveland, who, will skill and patience first introduced me to the subleties of bibliometrics. Dr. Cathleen Norris also provided useful ideas and comments along the way, and I appreciate her assistance.

I wish also to thank Sean C. Martin, whose capacity to practice the virtues of an authentic teacher is boundless; without his help this study would never have been completed.

My gratitude to my husband George Phelps, cannot be adequately expressed here; his contributions during the planning, research, and writing stages were beyond measure.

To the members of my family, Kevin Phelps, who assisted with the mysteries of statistical analysis, Michael Phelps, who solved vexing software problems, and to Kathryn Fischer and Laura Shaw, who formed a resounding team of cheerleaders whenever the need arose, I owe my heartfelt and deepest thanks.

Finally, the love, support, and encouragement of my mother Mildred Stegall, who started me on this road several years ago, cannot go unnoticed. Although she is no longer here to share in the final achievement, she is with me in spirit always.

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CHAPTER 1

The problem investigated in this study was whether the recommendations from The Church in the Modern World had been implemented in American Catholic theological research.

Purpose of the Study

The purpose of this study was to profile the quantitative characteristics of the Catholic research literature before and after Vatican II, and then to compare the changes in light of certain recommendations from that event.

Background

For centuries Catholic theologians were held on what Bokenkotter (1992) called a "very short leash" (p. 95). They were hesitant to engage in innovative or imaginative thought, and scholars concentrated largely on research in apologetics, the defense of Catholic doctrine. But by the middle of the 20th century, attitudes toward authoritative voices of any kind were changing, and Catholics began to think and write more critically about their relationship to the church. Democratic ideals, particularly as practiced in American culture, do not lend themselves to reliance on foreign hierarchies for guidance and direction, and many Catholics began to call for more local control of their own affairs.

New developments in science and the social sciences also brought the inevitable moral dilemmas that needed a more modern outlook; some called for entirely new perspectives. Revolutionary demographic shifts in the Catholic population to a non-European-centered church membership signaled to leaders that changes would be needed to acknowledge a more pluralistic, culturally varied church. With the new respect emerging for non-Western cultures, non-Catholic religions and beliefs would need to be addressed. In short, the church was in need of renewal if it intended to play a continuing and vital role in the life of its members.

To meet this challenge, Pope John XXIII convened an international council of Catholic leaders to address what could be done to make the church more vital, more significant, and more appealing to both modern-day and future generations of Catholics. He called this convocation the Second Vatican Council.

"Vatican II" (as that council is now known) met each autumn from 1962 to 1965. In his opening remarks to its participants, Pope John made it clear that his purpose in calling the council was not to clarify older doctrines or to promulgate new ones, but instead to engage in aggiornamento, or to bring new light and a fresh outlook into the existing church teachings. When the council closed, in the words of one theologian, Vatican II had been a "stunning success" (McCarthy, 1994, p. 75); it had crafted a renaissance--a new era of Catholicism that would revitalize almost all facets of the church's life. The new model for the church was "to a more historically conscious way of viewing dogmas. . . . [These dogmas] need to be reformulated when new cultural conditions arise which render the previous formulas unintelligible or at least obscure" (Bottenkotter, 1992, p. 96). The focus of the present study is on one community that shared in this renaissance, that of the theology scholars, who interpret and clarify the church's teachings and doctrines.

The ideas and themes that were to awaken and bring in this new spirit to Catholicism were published in a series of documents now known as the conciliar documents. One of the most important of these documents, The Church in the Modern World, was published in 1965. It is a constitution now more popularly known as Gaudium et Spes.

Several passages from this constitution are pertinent to the present study. They address the changes needed in the conduct of theological research, and issue an invitation to more members of the church laity to become involved in theological research.[1]

> In fact, recent research and discoveries in the sciences, in history and philosophy bring up new problems . . . and demand new scrutiny by theologians . . . sufficient use must be made not only of theological principles, but also of the findings of the secular sciences, especially of psychology and sociology . . . Those involved in theological studies in seminaries and universities should be eager to cooperate with men versed in other fields of learning by pooling their resources and their points of view. Theological research . . . should not lose contact with its own times. . . . Furthermore, it is hoped that more of the laity will receive adequate theological formation and that some among them will dedicate themselves professionally to these studies and contribute to their advancement. (GS, 62)

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[1]. The statements that are quoted in the text are from the English translation of *The Church in the Modern World* by Flannery (1992), and are found on pp. 962-968 in that work. The form of reference used, however, is that of the Catholic tradition, in which the initials of the Latin title of the document are used first, followed by a number representing the section in which the statements are found. This unique form of citation removes any doubt about where the quoted lines can be found in any translation of the document.

For the full text of these statements, see Appendix A.

Bibliometrics

Bibliometrics is a research technique that uses mathematical and statistical methods to analyze recorded discourse. The objective of these studies is to detect patterns in the way information is generated, retrieved, disseminated, and used, and falls within the parameters of Information Science. Because the results of these studies are derived from an examination of the published record, they are highly reliable and more objective than personal judgments or opinion surveys (Broadus, 1981).

A bibliometric analysis applies laws based on mathematical regularities to a literature. These laws exist in the natural world and describe regular and recurring patterns that help scientists to modify their actions when dealing with phenomena or when making predictions about their behavior. Lotka's Law of author productivity (Lotka, 1926) and Bradford's Law of title dispersion (Bradford, 1934) are used in these analyses to help researchers make statements about the productivity of authors and the number of core journals in a field.

Early in the 20th century, A. J. Lotka (1926) discovered that there was a mathematical regularity in the numbers of authors who produced the papers for a bibliography. According to Lotka, "The number [of authors] making n contributions is about $1/n^2$ of those making one; and the proportion of all contributors, that make a single contribution, is about 60%" (p. 323). In a well-defined subject field over a given period of time, a few authors in a field are very productive and account for a relatively large

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In this case, the initials GS stand for *Gaudium et Spes*.

percentage of all the publications. The remaining publications are produced by a large number of authors who publish perhaps only one article each. This inverse exponential relationship between these two groups is the basis for Lotka's Law. It has been used to find the productivity ratings for authors in many subject fields (Cline, 1982; Pao, 1984; Schorr, 1974).

Starting from the principle that every scientific subject is related to every other scientific subject, Bradford (1934) formulated a law to show that a large number of articles of interest in one subject generally appear in only a small number of journals but that they usually appear from time to time in other journals. According to Bradford, there is a mathematical relationship between the number of articles and the number of journals in which they appear. The number of journals that publish the largest number of articles is quite small. Bradford called this zone the nucleus. At the other extreme is a zone containing a large number of journals that publish perhaps only one article each (Zone 3). This zone usually includes a large number of journals compared to those in the nucleus. In the middle of these two zones is the second group, (Zone 2) containing a fair, but not large, number of articles.

Although a Bradford analysis cannot judge the quality of journals, it can highlight the most productive ones in a literature. For instance, Lancaster and Lee (1985) reported that 50% of the articles on "acid rain" were published in only three journals. Cline (1978) showed that only nine journals could provide researchers in the library profession with over half of their citations.

Most bibliometric studies begin with an analysis of citations, the most basic bibliometric data. The validity of these studies rests on several main propositions: (a) the literature of the field represents the field itself, (b) scholarly research relies on earlier research, (c) cited works are the most germane and therefore the most useful to a field of study, (d) patterns and regularities can be discovered by analyzing the characteristics of these cited works and (e) predictions for the use of the literature in a field can be based on past behavior patterns.

An analysis of the citations in a work can also provide the names of the most-cited authors, years, geographic locations of publishers, and formats; further analysis can also yield the names and locations of the institutions in which the most-cited authors are located.

Research Questions

The basic research objective was to determine whether certain recommendations promulgated by the documents of Vatican II are reflected by changing publication characteristics in the Catholic literature.

The research questions proposed by this study concern two areas of Catholic theological research, one dealing with authors and the other dealing with citations:

A. Authors: Were the characteristics of the authors who published in Theological Studies during the period before and after Vatican II significantly different?

1. What is the composition of the scholars in this community in terms of their characteristics?

1.1 What are their institutional affiliations and geographical locations?

1.2 What is their personal status--lay or clergy?

1.3 What is their gender?

1.4 What is their occupational status, academic or non-academic?

1.5 Have the authors' characteristics changed since Vatican II?

1.6 How have the authors' characteristics changed compared to the pre-Vatican II era?

2. Who are the most productive authors?

2.1 Has the productivity of the authors changed since Vatican II?

2.2 Who are the most productive authors before Vatican II?

2.3 Who are the most productive authors after Vatican II?

2.4 Have authors after Vatican II been more productive than those before Vatican II?

B. <u>Citations:</u> Were the characteristics of the citations used by these authors during the period before and after Vatican II significantly different?

1. What is the extent of subject dispersion in this literature?

1.1 To what extent do authors cite from different disciplines before Vatican II?

1.2 To what extent do authors cite from different disciplines after Vatican II?

2. What is the average age of the cited document?

2.1 Has the average age of the cited document changed since Vatican II?

2.2 Are specific years or spans of years more cited than others?

2.3 Are specific years or spans of years more cited before Vatican

II?

2.4 Are specific years or spans of years more cited than others after Vatican II?

3. What are the most-cited formats used in the cited documents?

3.1 What are the most-cited formats before Vatican II?

3.2 What are the most-cited formats after Vatican II?

4. What are the predominant languages used in the cited documents?

4.1 What are the predominant languages used before Vatican II?

4.2 What are the predominant languages used after Vatican II?

5. What are the names of the most-cited journals?

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5.2 What the names of the most-cited journals after Vatican II?

Significance of the Study

Bibliometric studies of philosophy, religion, and theology remain minimal in number and those that exist are outdated or incomplete. This study will help to fill that gap.

In 1997 there were 240 Catholic colleges and universities educating almost 700,000 students ("U.S. Catholics," 1998). Studies such as the present one, based on scientific research and the known usage of scholarly materials, can be valuable for librarians at these institutions. Lists of “core” journals and the most-productive authors can help in an assessment of their collections.

Students and scholars need to know where the most significant work is being done in their field. When asked how to find a precise set of instructions on how to do theological research, one preeminent theologian wrote: "find out who and where are the masters in the area. To him one must go, join in his seminar, do a doctoral dissertation under his direction" (Lonergan, 1971, p. 149). This study identifies the names of the most-productive authors and the most-productive institutions in Catholic theological research.

Definition of Terms

Bibliographic data: Information about the author, title, date, and place of publication of a cited work.

Cited Work: Work specifically cited in a footnote, endnote, bibliography, or list of references appended to an article.

Citing Work: Article in which the citation appeared.

Complete author count: Term used in conjunction with multiple authorship. In a complete count, all authors are counted as responsible for the entire work.

Complete citation count: Term used in conjunction with multiple citations. In a complete citation count, all citations to the same work in the same article, including “op. cit.” or “ibid” references, are counted.

Core journal: A journal that is part of the nucleus after a Bradford analysis is performed on the literature.

High subject-dispersion: Term used for a literature whose scholars cite a high percentage of their sources from fields and disciplines outside of their own.

Layperson: Term used to designate authors who are not members of the Catholic clergy or any Catholic religious order.

LC Class: Shorter term for “Library of Congress Subject Classification," a system of letters and numbers representing the subject matter of a work.

Low subject-dispersion: Term used for a literature whose scholars cite a low percentage of their sources from fields and disciplines outside of their own.

Non-Layperson: Term used to designate authors who are members of the clergy or a religious order.

Second Vatican Council: The assembly of the Pope and the College of Bishops of the Catholic Church which met from 1962-1965.

Self-citation: An instance in which the author of the cited document is the same author who wrote the citing document; an instance in which the cited journal is the same journal in which the article was published.

Subject Dispersion: The degree to which a scholar working in the field depends on published materials in other fields.

Theology: Speculation, talk, thought, and reasoning about God; this field concentrates on open and unsolved questions that cannot be settled by simple appeals to authority.

Title dispersion: The degree to which the useful literature is scattered through a number of different journals.

Vatican II: The shorter, more popular name for the Second Vatican Council.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This chapter is divided into two sections. The first introduces the basic theories of bibliometric techniques and presents the results of several studies. The second section summarizes the results of studies concerned with research of the literature of the humanities, the domain of knowledge to which theology belongs.

Bibliometric Studies

In its early years, bibliometric research was dependent on the manual recording and analysis of citations, a labor-intensive process that limited both the analytical techniques and graphic displays, and thus the number of studies. With the advent of computers in the 1960s and 1970s, and particularly the publication of computerized citation indexes at about the same time, bibliometric research in all disciplines began to appear in the library and information science literature. Bibliometric analyses were used to identify members of “schools” that implicitly exist in all scholarly communities and connect them by their shared theories and viewpoints. These studies also identified journals that had the most impact on a discipline and highlighted authors who were responsible for work on the same subject.

In the last several decades, bibliometric methods have been used for theoretical studies such as analyzing the influence of a single author, work, or idea on a discipline (Herubel & Buchanan, 1994a, 1994b). They also concentrate on more abstract information theories as they might relate to search and retrieval processes (Yoon, 1994), and theoretical distributions of the literature (Budd, 1988).

Citation Analysis

Studies using citation analysis have been abundant. The following section discusses only those that are seminal to an understanding of the subject, with particular emphasis on the functions of citation, referencing as metaphor, citer motivation, uncitedness, and how citation analysis results are used.

About 25 years ago, citations in scholarly works were recognized as significant tools from which one might study the research process. Most of the early work in citation analysis was done with the citations found in scientific literatures, but that situation began to change in the 1970s, when more analysis of the research publications of the social sciences and the humanities was conducted.

Most information science researchers agree that Price (1965b) set the foundation for all citation studies. He described scholarly activity and progress as an ongoing accumulation of recorded knowledge. He believed that analyzing the sources that researchers used as a basis for their own ideas was the key to understanding the nature of the scholarship in a particular field.

Cronin (1984) described the importance of citations as follows:

> Metaphorically speaking, citations are frozen footprints in the landscape of scholarly achievement. From footprints it is possible to deduce direction; from the configuration and depth of the footprint it should be possible to construct a picture of those who have passed by, while the distribution and variety furnish clues as to whether the advance was orderly and purposive

> . . . [Citations] give substantive expression to the process of innovation and if properly marshaled, can provide the researcher with a forensic tool of seductive power and versatility (p. 25).

Merton (1973) characterized citations as rewards that scientists bestow on their colleagues; the initial proponent of an idea receives an intellectual dividend each time his or her work is cited. These rewards have several effects, among them the cumulative advantage of repeated citation in later works. Merton named this advantage “The Matthew Effect," alluding to verse 29 from the gospel of the same name: “For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath.” This observation is similar to the success-breeds-success processes in biology, and the study of epidemiology in medicine.

Some researchers consider citations to be an indicator of the present and future value of certain scholars to the institution in which they work (Brown & Gardner, 1985) or an indication of the quality of the institution itself (Klingeman, 1986).

Smith (1981) found that many works might have been relevant to a published work, but do not appear as references because the authors did not know they existed, could not read the language in which they were published, or could not find them. This last finding has important implications for librarians, whose sole mission is to preserve and disseminate scholarly works.

Soper (1976) produced evidence to show that a scholar’s citing habits may be influenced as much by the physical location of the work as by any ostensible drive for excellence; scholars tend to use and cite the works that are the easiest for them to acquire. Even when libraries have sufficient materials, Kochen (1974) noted, authors often select references arbitrarily; not only are many documents that should have been cited missed entirely, but many that are cited are only slightly relevant.

Line (1979) showed that there are significant differences in citation patterns among the disciplines. Date distributions, forms of material cited, and self-citation may vary considerably, depending on the discipline being studied.

Humanities Research

Humanities scholars are often perceived to be more “scattered” in their approach to research, using sources that are too varied to contain an identifiable pattern. In part, this belief is based on the fact that humanities researchers are hard to pin down when queried about their needs. Budd (1988, 1990) surveyed higher education scholars and found that their research habits were highly personal; they relied more on themselves or serendipitous events than on any systematic or predictable search for materials. Hodges (1978) found that college professors teaching in this area regarded citations as providing the best leads to other works on the same subject. They also considered references to be an important way to find like-minded scholars in their own communities.

Soper (1976) found that humanities scholars used library collections extensively, but relied heavily on their personal libraries. Primary literature was so important that they usually possessed original materials for constant access and perusal. When using other libraries, a specific work could be so significant to their research that they were willing to wait many weeks or months for it to be obtained from another collection.

Bibliometric studies in the humanities are available now for such widely varied areas as fine arts (Nelson, 1977) archaeology (Sterud, 1978), music (Griscom, 1983), American history (Pao, 1984), and American literature (Budd, 1986, Frost, 1979).

Literature of the Humanities

The humanities disciplines include religion, philosophy, law, language, literature, art, music, education, and their related fields. The literature may include works that are discipline-specific, but humanities scholars have wide-ranging interests and use sources from other disciplines as a matter of course. Information Science studies that concentrate on the humanities literature are interested in the practical results, that is, the information seeking behavior and needs of the scholar, the format, aging pattern, languages, and subject dispersion of the scholar's citations, and the practical uses of the core lists generated from such studies. As Koenig (1978) wrote,

> The potential applications of bibliometric analysis based on citation data are particularly exciting for management of journal collections in the arts and humanities. . . citation data are at least as useful and appropriate for the arts and humanities as they have been for the sciences (p. 247).

Koenig further pointed out that, although there may be no single journal that speaks for all the humanities, "it is the 'lesser' journals about which information is needed" (p. 249).

Aging of the Literature

Citation analysis for evidence of literature "obsolescence" had its origin in the need for criteria that would help to efficiently and objectively cull materials in libraries. Librarians have traditionally used age as a criterion in this activity (Heisey, 1988). But for humanities scholars, some sources retain their informational value and never become obsolete. The word obsolescence has such pejorative connotations for them that the term aging is preferred for citation studies of humanities literature.

Some primary sources in music can retain their usefulness after more than 100 years (Vaughan, 1959). Bolles (1975) found that scholars in American studies still consult primary sources that are more than 80 years old. Heinzkill (1980) reported that over 70% of the literature used for English and American literary studies was more than 10 years old. Disciplines that focus on classic works, such as religion and philosophy, typically have low aging rates (Hodges, 1978; Itzchaky, 1979). On the other hand, a newer discipline such as sociology, as expected, is likely to use more current materials, with about 70% of the citations less than 11 years old (Broadus, 1952). Scholars researching academic libraries also use materials that are less than 10 years old for more than 77% of their citations (Budd, 1990).

Format

Prior research shows that humanities scholars prefer the use of monographs over any other form of material, ranging from 68-80% of the citations in linguistics, theology, fine arts, and literature to a low of about 40% for economics (Bowman, 1990). Schrader (1985) found that he had to develop a typology of 17 categories for his bibliometric study of the literature of education for librarianship. In an early study, Vaughan (1959) showed that music scholars used only about 30-40% of their research from periodicals. Simonton (1960) found that periodicals were cited in only 28.6% of the citations in fine arts. Heinzkill (1980) reported that the field of English literature was even more "book-bound," with journals cited less than 10% of the time. This usage rose slightly, as shown in a later study by Stern (1983), who identified 15.1% of the citations for literary studies as coming from periodicals. Citations to monographs in philosophy were so high that, for every one periodical cited, eight monographs were cited (Lindholm-Romantschuk & Warner, 1996). In his American literature study, Budd (1986) found that serials comprised an average of only about 25% of the citations. When Broadus (1989) tracked the journals requested by fellows at the National Humanities Center, he found periodical usage to be slightly higher, at 25-30%. Sociology researchers prefer the journal for about 38% of their sources (Baughman, 1974), but historians are divided almost evenly; they use journals about 42% of the time and monographs for about 50% of their citations. The results of these studies imply that not only do the citing habits of scholars differ, but the discipline under study plays an important role in the results.

Language Usage and Internationality

Most humanists are perceived to have good linguistic abilities; therefore it may be assumed that they use and cite many non-English sources. The results of most studies show, however, that scholars still prefer to use materials published in their own native language. American sociologists, for instance, use English-language materials more than 95% of the time (Baughman, 1974), while American Studies researchers cite them more than 97% of the time (Bolles, 1975). As expected, English literary studies (Heinzkill, 1980) and American history studies (Pao, 1984) follow the same pattern.

Certain fields must use a high proportion of materials published in foreign languages because of the nature of the field. Religion scholars cite German materials for 29-32% of their sources (Itzchaky, 1979). Whalen (1965) found that, although 78% of the citations used in Catholic dissertations were in English, about 9% were in German and 6% in French. German sources account for 26% of the sources used by fine arts scholars (Simonton, 1960) and nearly 22% of those used in musicology (Longyear, 1977).

Citations are analyzed to determine country of origin to determine how publications from various countries influence a scholar. When Herubel (1990) examined the citations in the International Library Review, he found that U. S. sources led in the number of sources cited, but that citations from India, Nigeria, and England also had a decided influence. Hakenen and Wolfram (1995) noted that the United States was the center of influence in mass communication, but they attributed this to the fact that it was a U. S.-centered field, and that few foreign-language journals were devoted to the subject.

The Effect of an Event on the Literature

Two studies explored the effect of an event on the literature of a discipline. These studies had similar objectives as the present study.

Sterud (1978) studied the literature of "Americanist Archaeology" after the discipline had undergone a significant shift in theoretical focus in the 1960s. A highly-respected scholar suggested the changes, and Sterud wanted to find "the degree to which such changes in viewpoint have been operationalized by being incorporated into the published record" (p. 294). He concluded that there was a serious implementation of the new ideas and that this change could be demonstrated by using the techniques of citation analysis.

Schrader (1985) believed that when a journal instituted a new refereeing policy for article submission, the journal's scholarliness would improve. Using the definition of scholarliness developed by Windsor and Windsor (1973), and the citations in the Journal of Educational Leadership as his source of data, he divided the articles into two time periods. The new policy was implemented in 1971, and by comparing the authors and citation data before and after 1971, he concluded that the change in policy had dramatically altered the scholarly characteristics of the journal.

Subject-dispersion of the Literature

Many studies in the humanities concentrate on the analysis of the subject dispersion of a literature, that is, the measure of the extent of references that are cited from subject areas other than the home discipline. These studies are not only theoretical, but have practical value. They can be useful to librarians responsible for collection development and assessment, since they are designed to reveal a scholar's needs for resources beyond those published in his or her own discipline. They can be used to plan the placement of collections in single-building libraries and help in decisions about the physical locations of new multi-building libraries.

If a field is truly interdisciplinary, it borrows ideas and research from other fields and has high subject dispersion. If authors cite works from their own field most of the time, the field has low subject dispersion. The "degree of self-containment" is a term that citation analysts use to describe this characteristic of research in a certain discipline. It can also be used when the degree of self-citation is high; that is, certain journals cite either themselves or each other the majority of the time (Cline, 1982).

Both Bolles (1975) and Herubel (1990) reported that the fields of History and Literature reflect high subject dispersion. Livesay (1953) found that economists rely heavily on law, agriculture, and technology sources. Sociologists use core journals that are, in themselves, interdisciplinary (Baughman, 1974). Education researchers use 75% of their materials from the combined fields of education, psychology, sociology, and political science. In her study, Pao (1984) found that although one journal in American history contained 11% of the cited articles, there was wide subject dispersion in the other journals cited. Native American Studies also has a high dispersion of its literature, with almost 42% of the citations to subjects other than itself (Heyser, 1977).

Some disciplines remain bound to their own literature. Cline (1982) examined the sources found in two prominent library science journals and noted that 61% of the citations were from sources in its own field, a high rate for a newly-oriented discipline that hopes to become more scientific. Biblical and Near-East studies (Itzchaky, 1979) also showed the same narrow focus, with 84% of the references coming from its own publications. Musicologists also tend to remain tied to the publications in their own field (Vaughan, 1959), but they temper this restricted view by citing non-English materials over one-third of the time (Longyear, 1977).

Only a few studies have dealt with the literature of religion or theology, and most have focused on theology as a sub discipline within the larger area of religion or biblical studies. Although clear divisions in the academic study of theology do exist (pastoral theology, systematic theology, etc.), there is no consensus in the literature itself as to exactly where the parameters of each division lie. For instance, moral theology may find its way into all areas and be taught and researched across the entire discipline; studies in pastoral theology and homiletics must necessarily use the findings of psychology and speech delivery. Studies on the family are also part of pastoral theology, biblical, historical, or philosophical research. These factors make control of the literature extremely difficult, as an abundance of materials can overwhelm both a scholar and the librarian who has responsibility for these collections. Many authors recognized this feature of theology and religion in their studies, and Wittig (1984) in particular, felt that its distinct fields were such an important characteristic of religious literature that he analyzed and presented each field separately.

Whalen (1965) conducted one of the earliest citation analyses for any literature. Working in the pre-Vatican II era, she used a sample of 100 dissertations from the Catholic University of America in the period 1952-1961 as the source of citation data for her own dissertation from Columbia University. She manually collected and analyzed over 8,000 citations, a prodigious undertaking at the time.

Whalen's (1965) results showed that 71% of the citations were to monographs and only 22% of them were to journals. The most-cited span of years of publication for the sources was the period from 1851-1910. The title dispersion for monographs was so large that only three of them were cited more than 25 times for the entire group, which dated back to the 16th century. The geographical mix of the citations showed that books and journals published in the United States accounted for about 58% of the cited literature, with England, Germany, and France constituting the rest, in that order. Language usage was about 78% English, 13.9% German, and French at 1.3%. Catholics cited materials in the original Latin 38.1% of the time, indicating that these scholars preferred citing primary materials rather than translations.

The analysis of the subject dispersion of the cited documents revealed that these scholars behaved like most humanists, citing materials from history, philosophy, education, sociology, and psychology, but the most frequently cited journals were, as expected, in the areas of theology or religion, accounting for over two thirds of the citations. This figure validates the impression that, when using journals at least, theology scholars preferred those of their own field. The remaining one third of the citations to journals were to the various social sciences.

Whalen’s (1965) prodigious effort is commendable, but her analysis was nevertheless incomplete. By using the dissertations at one university, she was actually testing the sources used by only one set of graduates at one location. Since it can be safely assumed that the graduates of a university would use most of their materials from their own institution, the analysis ran the risk of becoming merely a user-study of the materials in that library.

The dissertations were all written within a 9-year period, with Whalen’s (1965) samples selected only from the even-numbered years, but her tables were constructed so that they all appear to be from the same year. This would later affect her analysis of the age of the cited documents. The accurate age of the cited works should have depended on the year of publication of the individual dissertation in relationship to the year of each cited work, thus demanding a calculation for each dissertation, a fact that was not recognized in her analysis. In a decision that would cloud the results of her monograph analysis, she used encyclopedias, dictionaries, and festschriften under the term monographs. While a case could be made for festschriften to be a valid source for research, one would have to broaden the definition a bit for a dictionary. Whalen's use of these definitions of reference works meant that later researchers attempting to replicate or compare findings with hers would also be limited to that definition.

Whalen (1965) also did not distinguish between an original work and an unchanged reprint of it. If a 1963 edition of a 5th century work was published in its original form, with no additions or deletions, its age should be recorded as 5th century. Had the new edition been revised, enlarged, or reedited, or had the citation been to the introduction or other additional material, the date would have to be coded as the later edition.

Whalen (1965) anticipated the recommendations of Vatican II for more ecumenical activities, and thought that future research might draw different results. She also suggested that her study should be replicated, but in a different environment.

Following Whalen's (1965) recommendation, Heussman (1970) tried to validate her study by comparing the citations in a set of journals against the works actually used in a seminary environment. Heussman selected the 1965 volume of seven "important" English-language journals (taken from an opinion survey of theology professors) and compared his findings with their actual circulation in two seminary libraries. Nearly 74% of the references in the journal set were to monographs and only 25% of them were to periodicals. English citations were the most commonly used, about 53% overall. German was used 29% of the time, French 10% of the time, and Italian 3% of the time. Over 28% of the references were to materials published in the United States, but an almost equal number, 27%, were to those published in Germany. Twenty percent came from Great Britain, and 9% from France. Heussman's findings showed that 78% of the references were to materials in theology, a much higher percentage than Whalen's. He also noted that 12% of the references were to materials that were more than 50 years old.

The publications analyzed in Heussman's study were predisposed to the use of citations in the German language, since these seminarians were studying Luther's teachings. He accumulated over 4,000 citations, but like Whalen (1965) failed to distinguish between original editions of the classics and merely reprinted, unchanged editions of them. He also used the same broad definition of monographs as Whalen, including in this category encyclopedias, dictionaries, and other such sources.

Heussman's method can be questionable since he chose to take his source data from a list of the journals the seminary professors considered to be core journals, thus introducing a bias that could not be overcome.

McLeod (1973) presented a conference paper providing the results of a limited citation analysis of the journal literature of biblical studies. He analyzed nearly 4,000 citations and limited his source of data to five volumes of four different periodical titles. He found that 305 journals were cited, but almost 10% of the citations were to 1 journal. Five journals provided nearly one third of the citations and 10 journals provided over one half of the citations. The remaining 294 journals provided the rest of the citations. More than one half of the cited documents came from the period 1961-1970, within 10 years of the citing documents.

The five journals that McLeod (1973) chose as sources for his data represented too many sub-fields of religion to be compared to one another, since each came from a field with different research traditions. McLeod noted that in the future, data should be collected from many more years, because the issues and years tended to be dissimilar in their citation characteristics. He suggested that if the researcher wanted to study overall patterns, a great many years would have to be investigated.

The fact that Whalen (1965) Heussman (1970) and McLeod (1973) had used only American and English sources for their data troubled Itzchaky (1979). He tried to correct this bias by using samples selected from the main international indexing tool for the subject, <u>Elenchus Bibliographicus Biblicus</u>. In addition, he analyzed monographs, believing that if over 70% of the citations were to this form of material, this fact deserved more than a passing mention. He examined only two volumes of the index--1923 and

1971--since his interest lay in drawing conclusions about the "development of the discipline" in the intervals between these two years. His sample consisted of 240 sources, 50% from 1923 and 50% from 1971. These sources produced 2,250 citations, and characteristics of format, age, subject, language, and number of authors were analyzed.

Itzchaky (1979) found that these researchers used only 12% of their materials from journals in 1923 and that in 1971 the number had increased to only 22%. About one third of the serials that were high-ranked in the 1923 list still appeared in the 1971 list. The articles in 1923 had longer text than those in 1971, but the 1971 articles had more citations. Classic authors made up 21% of the citations in 1971, down from 30% in 1923. Unlike Whalen (1965) and Heussman (1970), Itzchaky treated reprints of an unchanged edition of an original work as the original work itself. Perhaps as a result of this, more than 50% of the citations came from works that were more than 20 years old. German-, English-, and French-language citations predominated in both years studied. In 1971, there was an increase in the number of publishers from the smaller countries (Netherlands, Israel, Spain). There was a high degree of "self-containment" in the field, with only 20% of the references in 1923 coming from outside of the discipline of biblical studies. That figure dropped slightly to 16% in 1971. This subject-dispersion rate may be a result of the fact that the area is understood and practiced by only a few scholars.

Itzchaky (1979) also applied his data to both the Bradford and Lotka laws. He found that the pattern of his cited sources did fit the Bradford pattern, but Lotka's prediction that 60% of the cited authors would publish only once failed to hold for his samples. He attributed this factor to the low number of scholars in the field.

Wittig (1984) explored the literature of religion. Because bibliographic control rather than usage was the objective of his study, he evaluated over 50 abstract and indexing tools, searching for their usefulness, accuracy, and scope. Twelve religious subject literatures, of which theology was one, were chosen for examination. Wittig's study resembles Itzchaky's (1979), but his findings have strong implications for those using abstracts and indexing tools alone as their retrieval tools. He concluded that the indexes were serving the community of systematic theologians very well, with between 84-100% of coverage, but the practical field was not well monitored, with only 56-69% of their journals indexed. Wittig found that 83% of the authors contributed only a single work, leaving about 17% of the articles to be written by approximately 400 authors--a high number of productive authors for this field. Wittig's definition of productive was three articles or more per author.

Wittig (1984) separated the subject-dispersion figures for theology from the rest of his data. He found that the field had a very low subject dispersion, with 75% of the literature from its own Library of Congress subject classification or its immediate neighboring classes. The core itself was composed of only 2 classes, BV and BT, both theology classes. Only 16 subject classes would be needed to provide 90% coverage for this field.

One fact in Wittig's (1984) study highlights the advantage of analyzing a sub-discipline apart from its parent discipline. Religion is composed of many sub-fields, some with orientations that are much more specialized and need a unique literature. For instance, coverage of the sociology of religion used an extensive number of essays that were generally published in journals but could also be found in edited monographs. These essays provided over 95% of this field's literature whereas the monograph rate was only around 4%. This is a startling rate of monograph usage for a humanities field and resembles those found for the sciences. If one were making decisions on which format to collect for this field, the emphasis would be on journals, certainly not an intuitive decision.

Hurd's (1984) smaller study on periodical titles used in religion provided limited but useful data. Using the articles in one volume of a major religion index, Religion Index One, as well as the Arts and Humanities Citation Index, Hurd accumulated over 1,900 references. She found that the average article contained about 20 citations, with the monograph as the most prevalent format. English, German, and French were the languages used most often, confirming the results of earlier studies by Whalen (1965) and Heussman (1970). Two of Hurd's findings can be valuable for collection developers in theological libraries: fewer than half of the articles cited in the sample had been published within 10 years of the citing article and approximately half of the serial literature cited by the authors was published in the last 12 years. Hurd suggested that librarians can take advantage of the online bibliographic databases available to access this portion of the serial literature, freeing the library from printed-serials storage demands.

CHAPTER 3

METHODOLOGY

The purpose of this study was to profile the quantitative characteristics of the Catholic research literature before and after Vatican II, and then to compare the changes in light of certain recommendations from that event.

The method chosen for research was a bibliometric analysis of the characteristics of the authors and the characteristics of the citations gathered from a random sample of issues of a leading theology journal for the period before the recommendations of Vatican II were published and the period after the recommendations were published. The analysis compared the publication profile in the two time periods in order to detect changes in these characteristics after Vatican II.

Data Source

The criteria for selecting a source journal were that it (a) be of a scholarly nature (Windsor & Windsor, 1973) (b) be specifically devoted to the subject of Catholic theological research, and (c) have an uninterrupted publishing history for at least 20 years both before and after the recommendations of Vatican II were published.

Only three possible candidate journals could meet the criteria outlined above: Theological Studies, Catholic Biblical Quarterly, and Catholic Historical Review. Each are quarterly publications which have published since 1940 and continue uninterrupted publication today. Each specifically highlights scholarly articles by placing them in separate sections in each issue. The authors in all three journals use the recognized scholarly traditions of citation to support their research. The gender, occupation, and institutional affiliation of the authors are clearly stated in each issue.

After an examination of the issues of each journal, it was apparent that their subject matter differed to a considerable extent. Theological Studies focuses on theology alone as its basic subject matter. The Catholic Biblical Quarterly concentrates on worldwide biblical studies and The Catholic Historical Review publishes articles concerned with the subject of Catholicism during various time periods of history. It was clear that only one of these three journals met the requirements for the study and it was decided to use the journal Theological Studies as the sole source of data.

The aims and audience of the journal were identified in the comments made by its original sponsor, the publication America: "It will not be theology for beginners. Its aim is to present the fruits of serious theological research in the various [fields] comprised under such studies: dogma, scripture, liturgy, etc." (“Comments,” 1940a, p. 591) The editors of America also lent their approval to its initial issues: "[the editor] . . . is fulfilling the original aim of this theological venture, namely that of creating an organ through which theologian might speak to theologian, the latest research might be transmitted to research workers" (“Comments,” 1940b, p. 87).

Theological Studies began publication in 1940 with four issues per year and this publication schedule has continued without interruption. A total of 224 issues were available for analysis. Each issue contained two to four articles.

Limitations

Articles

Articles were limited to those prominently featured by the editors in the special sections titled “Articles” from 1940 to 1995 inclusive. Issues that were devoted to festschriften, or whose purpose was to report proceedings or to disseminate annual reports were excluded. Editorials, news items, notices of programs, reports of meetings, and book reviews, within each issue were also excluded.

Citations

Any reference, citation, or footnote that cited a specific work or was cited in the form “ibid” or “op. cit.” was included. All references, footnotes, or citations added by the editors were excluded. All citations to the Bible, papal documents, or patristic and medieval authors were excluded.

Assumptions

The assumption was made that authors in Theological Studies use traditional scholarly practices in their published work and that each citation referred to by an author in the article was actually consulted in preparing the article. It was also assumed that that the citations were accurately recorded by the authors.

Time Periods for Study

The profiles of both authors and citations were generated separately for two distinct time periods, the first before Vatican II (1940-1967), and the second, after Vatican II (1968-1995). Although the council ended in 1965, a 2-year time lag is used as the beginning of the Vatican II period to allow for theologians to internalize the recommendations, research and write an article, submit it for publication, perform any subsequent editing, and to allow for time for the article to appear in the journal. This time lag was also used by Sterud (1978) whose study had aims similar to the present one.

Procedures for Data Collection

The data was manually gathered from a random sample consisting of 50% of the issues from each time period. The total number of issues examined was 112. A total of 56 issues before Vatican II and 56 issues after Vatican II were analyzed.

Construction of the main database was in two parts: The first part consisted of the characteristics of the authors and the second part consisted of the characteristics of the citations. These two databases were each further divided into the pre-Vatican II and post-Vatican II years so that any differences in the author and citation characteristics in the two time periods could be compared.

Author Database

The following characteristics of each author constituted the author database: (a) author's institutional affiliation, (b) geographic location of the institution, (c) status of the author as lay person or non-layperson, (d) gender, (e) religious order to which the author was affiliated if applicable, (f) occupation of the author, (g) principal author's name, (h) names of each of the co-authors, up to three. It should be noted that multiple authorship of one work was treated as if each author was responsible for the entire work. The occupational status of the author was obtained by identifying the type of institution in which he or she was located when the article was published. If the author listed an institution which was a seminary, college or university, the author was considered to be an academic. Those who were not in colleges, seminaries, or universities were considered to be non-academics.

Citation Database

The following characteristics were collected for each cited work and constituted the citation database: (a) publication year, (b) type of format, (c) place of publication, (d) language of publication, (e) name of author, (f) name of editor, (g) title of the journal if in that format, (h) notation for an author or journal self-citation, and (i) Library of Congress subject classification if the citation was to a journal.

Each "op cit." and "ibid" was counted as a new citation. If several different pages or sections of a work were cited in a single citation, each mention was counted as a separate citation to that work.

References to the Bible, patristic documents, or papal encyclicals were not collected. These three types of references are used as basic sources in theological research, and it was expected that the results of the analysis would be too heavily skewed toward them.

The following types of formats were collected and analyzed: (a) monographs, (b) journals, (c) reference works and serials, (d) theses and dissertations, (e) annual reports, (f) seminars or conference papers, (g) festschriften, (h) biblical commentaries, and (i) miscellaneous formats.

Titles were not analyzed. It did not seem beneficial to collect them since few were expected to be cited more than once. Whalen (1965), Itzchaky (1979), and Vaughan (1959) all found that only a few of the titles they analyzed were cited more than once.

Language of the cited work was assigned from its title. English translations were collected and analyzed only if the author indicated that the translated work as well as the original version had been used in preparing the article.

The technical features, or editorial content of all of the issues of the journal from 1940 to 1995 were also collected and analyzed. Specific properties noted were the total number of pages and articles, and the beginning and ending page numbers of the articles. The purpose of this inventory was to track the growth or decline of the number of the articles and the number of pages devoted to articles vis a vis other material during the publication history of the journal. An analysis of these features is useful to researchers, editors, and authors in assessing a journal's focus.

Form for Data Collection

Separate forms were designed for the collection of the information that constituted each database. A copy of the entry field and form for author data is in Appendix D. A copy of the entry field and forms for citation data is in Appendix E.

Pilot Study

A pilot study was conducted at the University of Dallas in Irving, Texas. One volume from each 10-year period of Theological Studies was examined to determine (a) the number of citations per article and per issue, (b) the number of articles and citations per year, (c) the presence of biographical information about each author, and (d) the format of the authors’ citations. Notes were also made about the time taken to collect the information about the author and each of the citations in the articles.

The results of the pilot study showed that the original form was acceptable but lacked space to record the wide range of types of cited documents. The pilot form was revised to include a series of extended codes for the “format” field. (See Appendix E)

There were numerous “op cit.” and “ibid” citations and many footnotes contained citations to several works, some as many as 40 in one footnote. This increased the amount of time needed for data collection. The large number of references to foreign-language documents also increased the amount of time needed to interpret them. The citations followed the standard format, or could be adjusted to it. Most articles were single-authored, with full names, religious affiliation, and institutional and geographic locations present in the byline of the author. Gender of the author was evident from the name or religious affiliation of the author.

Lotka and Bradford Bibliometric Laws

Lotka's Law of Author Productivity

Lotka's Law states that there is an inverse relationship between the number of articles produced and the number of authors producing the articles. He states the general formula:

$x^n y = c$ (constant)

1) where y = the portion of authors making x contributions each;

2) n and c are parameters that depend on the field being analyzed

In Lotka's own study, the value of $c = 2$. The following expressions used to solve the primary equation illustrate this inverse relationship:

$$x^n y = c \qquad (1)$$

$$y = c/x^n \qquad (2)$$

$$y = cx^{-2} \qquad (3)$$

The steps used to apply Lotka's Law to the literature in this study were the following:

1. The number of authors who produced articles and the number of articles which they produced were counted.

2. A table was constructed showing the number of authors producing 1 article each, the number producing 2 articles each, and so on.

3. A least-squares regression analysis was performed on the data to determine the appropriate Lotka parameters. The results were calculated with the Lotka equation.

4. The Kolmogorov-Smirnov goodness-of-fit test was applied.

The detailed formula and complete computations for the test of Lotka's Law are found in Appendix B.

The Bradford Law of Title Dispersion

Bradford stated that in a given subject field over a period of time, a few journals publish a relatively high percentage of the items and there are many journals that publish only a few items each. There is an inverse relationship between the number of journals and the number of items.

Bradford stated that the relationship between the journals and items should be in the proportion:

$1:n:n^2. . . .$

The steps used to apply Bradford's Law were the following:

1. The cited journals and the number of citations which each journal produced were counted.

2. The journals were placed in rank order beginning with the journal that provided the most citations.

3. A table was constructed with the first column showing the number of journal titles, and the second column showing the number of citations for each title.

4. A third column for cumulative number of titles, a fourth column for the cumulative number of citations, and a fifth column for the cumulative percentage of citations were added to the table.

5. Retaining the order of the sources, the list was divided into groups (zones) so that the number of articles each produced was approximately the same. The groups were identified as the nucleus, Zone 2, and Zone 3.

6. Bradford's multipliers were computed for the predicted number of titles in each zone.

7. The observed number and the predicted number of journals were compared to test whether this literature adhered to Bradford's Law.

The detailed formula and computations for the test of Bradford's Law of title dispersion in this study are found in Appendix C.

CHAPTER 4

RESULTS OF THE ANALYSIS

The purpose of this study was to determine whether the recommendations made by the Second Vatican Council to Catholic theologians in 1965 concerning their research methods had been implemented. The council suggested that theologians' research should include the methods and findings of the modern secular sciences, that they should use more current research, and that more members of the laity, including women, should become involved in theological explorations.

Two major research questions were formulated: (a) Were the characteristics of the authors who published in Theological Studies during the period before and after Vatican II significantly different, and (b) were the characteristics of the citations used by these authors during the period before and after Vatican II significantly different?

In order to answer these questions, several ancillary questions were added to each major question. For the question about the author characteristics these questions were: (a) of what types of scholars was this community composed, in terms of their personal characteristics, and (b) who were the most productive authors?

For the question about the characteristics of the citations, the questions were: (a) what was the extent of subject dispersion in this literature, (b) what were the most-cited years, formats, languages, and geographic locations of the cited works, and (c) what were the names of the most-cited journals used in the cited documents?

The results of the analysis are presented below in five sections:

1. Analysis of the characteristics of the authors,

2. Analysis of the productivity of the authors, including a test of Lotka's Law of author productivity,

3. Analysis of the technical features of the journal before and after Vatican II,

4. Analysis of the subject dispersion of the literature, including test for Bradford's Law of title dispersion,

5. Analysis of the characteristics of the citations.

Items Analyzed in the Study

Table 1 is a summary of the issues, articles, and citations analyzed for this study.

Table 1

Summary of the Citations, Articles, and Issues: Pre- and Post-Vatican II

	Pre-Vatican II	Post-Vatican II	% Increase	Total
Number of Issues	56	56	---	---
Number of Articles	156	228	47.4	381
Avg. Articles per Issue	2.8	4.1	47.4	3.4
Number of Citations	8,508	17,300	103.3	25,808
Avg. Citations per Article	55.2	76.2	37.9	67.7

Table 1 shows that before Vatican II authors cited 8,508 items and after Vatican II they cited 17,300 items, an increase of over 103%. The average number of citations per article before Vatican II was about 55, and the average number after Vatican II was about 76, an increase of approximately 38%.

Characteristics of the Authors

Data on the author's institutional affiliations, geographical locations, personal status as layperson or clergy, the religious order to which the author belonged, gender, and occupational status was gathered in order to analyze the characteristics of the authors.

The results of this analysis on the author characteristics is presented. If additional information was found to be of interest, it is also included in the appropriate section.

Institutional Affiliation of the Author

Table 2 shows the institutions in which the authors were located for the pre-Vatican II years. Only institutions which provided authors of three or more articles are shown in the table.

Table 2

Institutional Affiliation of the Authors: Pre-Vatican II

Institution	No. of Articles	% of Articles	Cumulative % of Articles
[a]Woodstock	32	20.5	20.5
[a]St. Mary's College of Kansas	23	14.7	35.3
[a]Weston College	19	12.2	47.4
Catholic University of America	8	5.1	52.6
[a]West Baden College	6	3.8	56.4
[a]Alma College	5	3.2	59.6
[a]St. Mary of the Lake	5	3.2	62.8
[a]Jesuit Seminary of Canada	4	2.6	65.4
St. Mary's College of India	4	2.6	67.9
Marquette University	3	1.9	69.9
University of Notre Dame	3	1.9	71.8
[a]St. Mary's Seminary of Maryland	3	1.9	73.7

[a]denotes a seminary

Only 12 institutions provided authors who produced three or more articles. These authors produced over 73% of the total number of articles published. Woodstock and St. Mary's, two Jesuit seminaries, provided authors who produced over 35% of the articles. It took the next eight institutions to equal the output of authors from these two seminaries alone. The Catholic University of America contributed authors who wrote about 5% of the articles and Marquette University and the University of Notre Dame were the home institutions of authors who produced slightly less than 2% of the articles respectively.

Table 3 shows the institutional affiliation of the authors after Vatican II. Only those institutions which provided authors of three or more articles are shown in the table.

Table 3

Institutional Affiliation of Authors: Post-Vatican II

Institution	No. of Articles	% of Articles	Cumulative % of Articles
Catholic University of America	22	9.6	9.6
[a]Jesuit School of Theology at Berkeley	18	7.9	17.5
Boston College	12	5.3	22.8
[a]Weston College	12	5.3	28.1
University of Notre Dame	10	4.4	32.5
Loyola University of Chicago	8	3.5	36.0
Regis College (Canada)	6	2.6	38.6
[a]Woodstock	6	2.6	41.2
[a]Gregorian Institute	5	2.2	43.4
University of Detroit	5	2.2	45.6
Fordham University	4	1.8	47.4
[a]Catholic Theological Union	3	1.3	48.7
Fairfield	3	1.3	50.0
Georgetown University	3	1.3	51.3
Marquette University	3	1.3	52.6
St. Paul's University (Canada)	3	1.3	53.9

University of St. Thomas (MN)	3	1.3	55.3
[a]Union Theological Seminary	3	1.3	56.6

[a]denotes a seminary

After Vatican II 18 institutions provided authors that published three or more articles. Among them, 12 are full-scale colleges or universities. Together, the Catholic University of America and the Graduate Theological Union at the University of California at Berkeley provided authors who wrote over 17% of the articles. Boston College, which was not on the list before Vatican II, contributed authors of over 5% of the articles after Vatican II. It should be noted that authors from Notre Dame published three articles in the pre-Vatican II period but the number of publications increased to 10 after Vatican II.

After Vatican II 50% of the articles were written by authors from only 13 institutions, whereas before Vatican II, 50% of the articles had been written by authors from only four institutions (See Table 2).

Table 4 shows the 10 institutions which provided the authors for the pre- and post-Vatican II years.

Table 4

Institutional Affiliation of the Authors: Total Number of Articles

Produced Pre- and Post-Vatican II

Institution	No. of Articles	% of Articles	Cumulative % of Articles
[a]Woodstock	38	9.9	9.9
[a]Weston College	31	8.1	18.0

Catholic University of America	30	7.8	25.8
[a]St. Mary's College (USA)	25	6.5	32.3
[a]Jesuit School of Theology at Berkeley	18	4.7	37.0
University of Notre Dame	13	3.4	40.4
Boston College	12	3.1	43.5
Loyola University of Chicago	10	2.6	46.1
Fordham University	6	1.6	47.7
Marquette University	6	1.6	49.2

[a]denotes a seminary

Four institutions provided authors who wrote over 30% of the total number of articles. Three of these institutions are seminaries.

Geographical Distribution of the Institutions

Table 5 shows the geographic distribution of the institutions for the pre- and post-Vatican II years, analyzed as a whole.

Table 5

Geographic Locations of Institutions: Pre-Vatican II

Country	No. of Articles	% of Articles	Cumulative % of Articles
USA	128	82.1	82.1
Canada	10	6.4	88.5
India	4	2.6	91.0
England	3	1.9	92.9
Italy	2	1.3	94.2
Belgium	1	0.6	94.9
France	1	0.6	95.5
Germany	1	0.6	96.2
Ireland	1	0.6	96.8
Israel	1	0.6	97.4
Japan	1	0.6	98.1
Scotland	1	0.6	98.7
Sri Lanka	1	0.6	99.4

Unknown	1	0.6	100.0
Total	156		

Table 5 shows that institutions in the United States and Canada provided authors who wrote almost 90% of the articles. Authors from institutions in India wrote nearly 3% of the articles, and those in England about 2% of the articles. Eight other European and Asian countries were locations of authors who wrote about 5% of the articles.

Table 6 shows the geographic locations of the institutions after Vatican II.

Table 6

Geographic Locations of Institutions: Post-Vatican II

Country	No. of Articles	% of Articles	Cumulative % of Articles
USA	191	83.8	83.8
Canada	12	5.3	89.0
Italy	8	3.5	92.5
Australia	7	3.1	95.6
England	4	1.8	97.4
Germany	3	1.3	98.7
Netherlands	1	.4	99.1
Unknown	2	0.9	100.0
Total	228		

After Vatican II, Australia, which did not appear at all in the pre-Vatican II list was now the location of institutions which provided authors of over 3% of the articles. German institutions were the locations of the authors of three articles, whereas before Vatican II, the author of only one article was from Germany. Italian locations have risen significantly in the ranks from slightly over 1% of the total before Vatican II (see Table

5) to 3.5% after Vatican II. Except for the Netherlands, the smaller countries have all but disappeared from the list after Vatican II.

Table 7 shows the geographic locations of the institutions for the pre- and post-Vatican II years, analyzed as a whole.

Table 7

Geographic Locations of Institutions: Pre- and Post-Vatican II

Country	No. of Articles	% of Articles	Cumulative % of Articles
USA	319	83.1	83.1
Canada	22	5.7	88.8
Italy	10	2.6	91.4
England	7	1.8	93.2
Australia	7	1.8	95.1
India	4	1.0	96.1
Germany	4	1.0	97.1
Belgium	1	0.3	97.4
France	1	0.3	97.7
Ireland	1	0.3	97.9
Israel	1	0.3	98.2
Japan	1	0.3	98.4
Scotland	1	0.3	98.7
Sri Lanka	1	0.3	99.0
Netherlands	1	0.3	99.2
Unknown	3	0.8	100
Total	384	100	

The United States led in the percentage of institutions (83.1%) for the pre- and post-Vatican II years by a large margin. Canada and Italy combined, provided 8.3% of the total.

Geographical Location of the Institutions by U.S. States

Table 8 shows the states in which the institutions were located in the pre- and post- Vatican II years.

Table 8

Geographic Location of the Institutions by U.S. States: Pre-Vatican II

State	No. of Articles	% of Articles	Cumulative % of Articles
[a]MD	36	28.1	28.1
[a]KS	23	18.0	46.1
[a]MA	19	14.8	60.9
DC	11	8.6	69.5
[a]IN	9	7.0	76.6
[a]IL	8	6.3	82.8
NY	8	6.3	89.1
[a]CA	5	3.9	93.0
WI	4	3.1	96.1
CT	2	1.6	97.7
MO	1	0.8	98.4
GA	1	0.8	99.2
NJ	1	0.8	100.0
Total	128		

[a]denotes a productive seminary location

Table 8 shows that in the pre-Vatican II years 60% of the articles were written by authors who were from institutions in three states. These were the states in which the seminaries were located -- Maryland, Kansas, and Massachusetts.

Table 9 shows the location of the U.S. institutions by state for the post-Vatican II years.

Table 9

Geographic Location of the Institutions by U.S. States: Post-Vatican II

State	No. of Articles	% of Articles	Cumulative % of Articles
DC	31	16.2	16.2
[a]MA	29	15.2	31.4
[a]CA	25	13.1	44.5
NY	17	8.9	53.4
[a]IL	16	8.4	61.8
[a]IN	12	6.3	68.1
[a]MD	7	3.7	71.7
MI	7	3.7	75.4
MN	7	3.7	79.1
CT	6	3.1	82.2
MO	5	2.6	84.8
PA	4	2.1	86.9
WI	4	2.1	89.0
[a]KS	3	1.6	90.6
NJ	3	1.6	92.1
OH	3	1.6	93.7
WA	3	1.6	95.3
VA	2	1.0	96.3
SD	2	1.0	97.4
IO	1	0.5	97.9
WY	1	0.5	98.4
AL	1	0.5	99.0
LA	1	0.5	99.5
TX	1	0.5	100
Total	191		

After Vatican II, Kansas dropped in the rankings while New York and Illinois moved up with at about 9% and 8% respectively. California's position moved from eighth position before Vatican II to third position after Vatican II.

Table 10 shows the geographic locations of the institutions by states for the pre- and post-Vatican II period, analyzed as a whole.

Table 10

Geographical Location of the Institutions by U.S. States: Pre- and Post-Vatican II

State	No. of Articles	% of Articles	Cumulative % of Articles
[a]MA	48	15.0	15.0
[a]MD	43	13.5	28.5
DC	42	13.2	41.7
[a]CA	30	9.4	51.1
[a]KS	26	8.2	59.2
NY	25	7.8	67.1
[a]IL	24	7.5	74.6
[a]IN	21	6.6	81.2
CT	8	2.5	83.7
WI	8	2.5	86.2
MI	7	2.2	88.4
MN	7	2.2	90.6
Other	98	9.4	100.00

[a]denotes a productive seminary location

Table 10 shows that for the pre- and post-Vatican II years, in general, the same states retain their rankings as they did in the periods before and after Vatican II (See Tables 8 and 9). Almost 75% of the articles were provided by authors whose home institutions were located in seven states and authors affiliated with institutions from only 12 states furnished over 90% of the articles.

Status of the Author as a Layperson or Non-Layperson

One of the recommendations of Vatican II had been that more laypersons should become more involved in theological explorations. The documents of Vatican II define a layperson as a person who is not a member of the clergy or a religious order.

Table 11 shows the results of the analysis of the status of the authors of the articles as laypersons or non-laypersons for the pre- and post-Vatican II years and for the both periods analyzed as a whole.

Table 11

Status of the Authors as Laypersons and Non-Laypersons

	Pre-Vatican II		Post-Vatican II		Total Sample	
Author Status	No. of Articles	% of Articles	No. of Articles	% of Articles	No. of Articles	% of Articles
Layperson	6	3.8	82	36.0	88	22.9
Non-Layperson	150	96.2	146	64.0	296	77.1
Total	156		228		384	

The analysis shows that of the 156 articles written in the pre-Vatican II years about 96% were written by a non-layperson. Only six articles, or about 4% were written by a layperson.

After Vatican II, the percentage of authors who were non-laypersons dropped significantly to only 64% of the total authors. The number of articles written by a layperson rose to 36% of the total, slightly over one-third of the total number of articles.

For the pre- and post-Vatican II years, about 77% of the articles were written by authors who were members of the clergy or religious orders. Laypersons were responsible for about 23% of the articles.

Gender of the Authors

Table 12 shows the results of the analysis of the gender of the authors for the years before and after Vatican II, and for both time periods analyzed as a whole.

Table 12

Gender of Author

Gender	Pre-Vatican II		Post-Vatican II		Pre- and Post-Vatican II	
	No. of Articles	% of Articles	No. of Articles	% of Articles	No. of Articles	% of Articles
Men	156	100.0	204	89.5	360	93.8
Women	0	0.0	24	10.5	24	6.2
Total	156		228	100.0	384	100

Before Vatican II there were no women authors. After Vatican II the number of women authors increased significantly to over 10% of the total, although for all the years of the study, they wrote less than 7% of the articles.

Occupation of the Author

Table 13 shows the occupation of the author for the pre- and post-Vatican II years and for both time periods analyzed as a whole.

Table 13

Occupation of the Author: Pre- and Post-Vatican II

Occupation	Pre-Vatican II No. of Articles	Pre-Vatican II % of Articles	Post-Vatican II No. of Articles	Post-Vatican II % of Articles	Pre-Vatican II and Post-Vatican II No. of Articles	Pre-Vatican II and Post-Vatican II % of Articles
Academic	143	91.7	202	88.6	345	89.8
Non-Academic	9	5.8	18	7.9	27	7.0
Unknown	4	2.5	8	3.5	12	3.2
Total	156		228		384	100

Before Vatican II, almost 92% of the articles were written by an author who was affiliated with an academic institution. After Vatican II this number decreased slightly to about 89%. The number of articles written by non-academic individuals doubled after Vatican II to form almost 8% of the total. Articles written by authors from "other" settings such as ministerial centers and churches, or connected with various other corporate entities form a small percentage of the total authors for all time periods.

Summary of the Characteristics of the Authors

Table 14 shows a summary of the characteristics of the authors. Note that institutional affiliation has been categorized into type.

Table 14

Summary of Author Personal Characteristics: Pre- and Post-Vatican II

Characteristic	Pre-Vatican II % of Articles	Post-Vatican II % of Articles	% Point Change
[a]Institutional Affiliation			
Seminary	76.7	40.4	-36.3
Non-seminary	23.3	59.6	36.3
Geographic Location			
USA	82.1	83.8	1.7
Non-USA	17.9	16.2	-1.7
Personal Status			
Lay	3.8	36.0	32.2
Non-Lay	96.2	64.0	-32.2
Gender			
Men	100.0	89.5	-10.5
Women	0.0	10.5	10.5
Occupational Status			
Academic	91.7	88.6	-3.1
Non-Academic	5.8	7.9	2.1
Unknown	2.5	3.5	1.0

[a]Characteristic categorized by type

Names of the Most-Productive Authors

Several of the research questions centered on the productivity of the authors: (a) who were the most productive authors for this literature, (b) who were the most-productive authors before and after Vatican II, and (c) had the productivity of the authors changed after Vatican II?

Most-Productive Authors: Pre-Vatican II

Table 15 shows the names of the most-productive authors in the pre-Vatican II years. Only those authors who wrote more than three articles are shown in the table.

Table 15

Author Productivity: Pre-Vatican II

Author	No. of Articles	% of Articles	Cumulative % of Articles
Murray, John Courtney	8	5.1	5.1
Palmer, Paul F.	5	3.2	8.3
Kelly, Gerald A.	5	3.2	11.5
De Letter, P.	4	2.6	14.1
Dulles, Avery	4	2.6	16.7
Vollert, Cyril J.	4	2.6	19.2
Ellard, Gerald	3	1.9	21.2
Fitzmyer, Joseph A.	3	1.9	23.1
Grabowski, Stanislaus J.	3	1.9	25.0
Lonergan, Bernard J. F.	3	1.9	26.9
McKenzie, John L.	3	1.9	28.8
Saunders, Daniel J.	3	1.9	30.8

Twelve authors wrote three or more articles before Vatican II. Three of the authors contributed 11.5% of the articles. One author was responsible for more than 5% of the articles, and only seven authors wrote more than 20% of the articles.

Most-Productive Authors: Post-Vatican II

Table 16 shows the names of the most-productive authors in the post-Vatican II years. Only those authors who wrote more than three articles are shown in the table.

Table 16

Author Productivity: Post-Vatican II

Author	No. of Articles	% of Articles	Cumulative % of Articles
Fitzmyer, Joseph A.	4	1.8	1.8
Starkloff, Carl F.	4	1.8	3.5
Coffey, David M.	3	1.3	4.8
Dulles, Avery	3	1.3	6.1
McDonnell, Kilian	3	1.3	7.5
O' Malley, John W.	3	1.3	8.8
Saliba, John A.	3	1.3	10.1
Van Beeck, Franz J.	3	1.3	11.4

In contrast to the pre-Vatican II years when 12 authors wrote more than three articles (see Table 15), after Vatican II there were only eight authors who wrote more than three articles. It took all eight of these authors to produce approximately the same percentage (11.4%) of the articles as the three top-producing pre-Vatican II authors. After Vatican II, no single author was responsible for more than 2% of all the articles, whereas before Vatican II six authors had produced more than 2% each (See Table 15).

Table 17 shows the names of the most-productive authors for the pre- and post-Vatican II years, analyzed as a whole. Only authors responsible for three or more articles are shown in the table.

Table 17

Author Productivity: Pre- and Post-Vatican II

Author	No. of Articles	% of Articles	Cumulative % of Articles
Murray, John Courtney	8	2.1	2.1
Dulles, Avery	7	1.8	3.9
Fitzmyer, Joseph A.	7	1.8	5.7
Kelly, Gerald A.	5	1.3	7.0
Palmer, Paul F.	5	1.3	8.3
Brown, Raymond E.	4	1.0	9.4
De Letter, P.	4	1.0	10.4
Starkloff, Carl F.	4	1.0	11.5
Vollert, Cyril	4	1.0	12.5
Burghardt, Walter J.	3	0.8	13.3
Coffey, David M.	3	0.8	14.1
Ellard, Gerald	3	0.8	14.8
Grabowski, Stanislaus J.	3	0.8	15.6
Lonergan, Bernard J. F.	3	0.8	16.4
McDonnell, Kilian	3	0.8	17.2
McKenzie, John L.	3	0.8	18.0
O' Malley, John W.	3	0.8	18.8
Quay, Paul M.	3	0.8	19.5
Saliba, John A.	3	0.8	20.3
Saunders, Daniel J.	3	0.8	21.1
Van Beeck, Franz J.	3	0.8	21.9
Wright, John H.	3	0.8	22.7

Table 17 shows that one author, John Courtney Murray, in spite of not appearing at all on the post-Vatican II list (see Table 16), still retained the highest position for article output for all the years 1940-1995. The three most-productive authors wrote almost 6% of all the articles.

Lotka's Law of Author Productivity

The complete calculations for the test of Lotka's Law of productivity for all time periods are reproduced in Appendix B. Only the result of the calculations is presented in the following section.

Lotka Analysis: Pre-Vatican II

Table 18 shows the results of the test of the Lotka analysis of author productivity for the pre-Vatican II years.

Table 18

Lotka Analysis: Pre-Vatican II

No. Articles per Author	Observed No. Authors	Observed % of Authors	Predicted % Of Authors
x		y	y'
1	67	67.68	69.27
2	20	20.20	15.89
3	6	6.06	6.72
4	3	3.03	3.65
5	2	2.02	2.27
6	0	0.00	1.54
7	0	0.00	1.11
8	1	1.01	0.84

Note
Lotka Formula: $c = yx^n$
where: y = No. of authors publishing x articles,
and c and n are parameters to be determined by regression analysis,
y' = The predicted y value using the regression formula.

Linear "Least Squares" Regression Analysis Results:

n= 2.1237; c= 69.2669

Using the values of *n* and *c* as determined by the least squares regression analysis the Lotka formula becomes:

$69.2669 = yx^{2.1237}$

The values for each *y′* (the predicted y value) are shown in column 4 of the table.

The data is converted into a log/log chart to visually compare the fit to a perfect Lotka distribution, which would show the data very close to the straight line.

Figure 1 shows the log/log chart for the pre-Vatican II period. Note that the data is described as a proportion of authors.

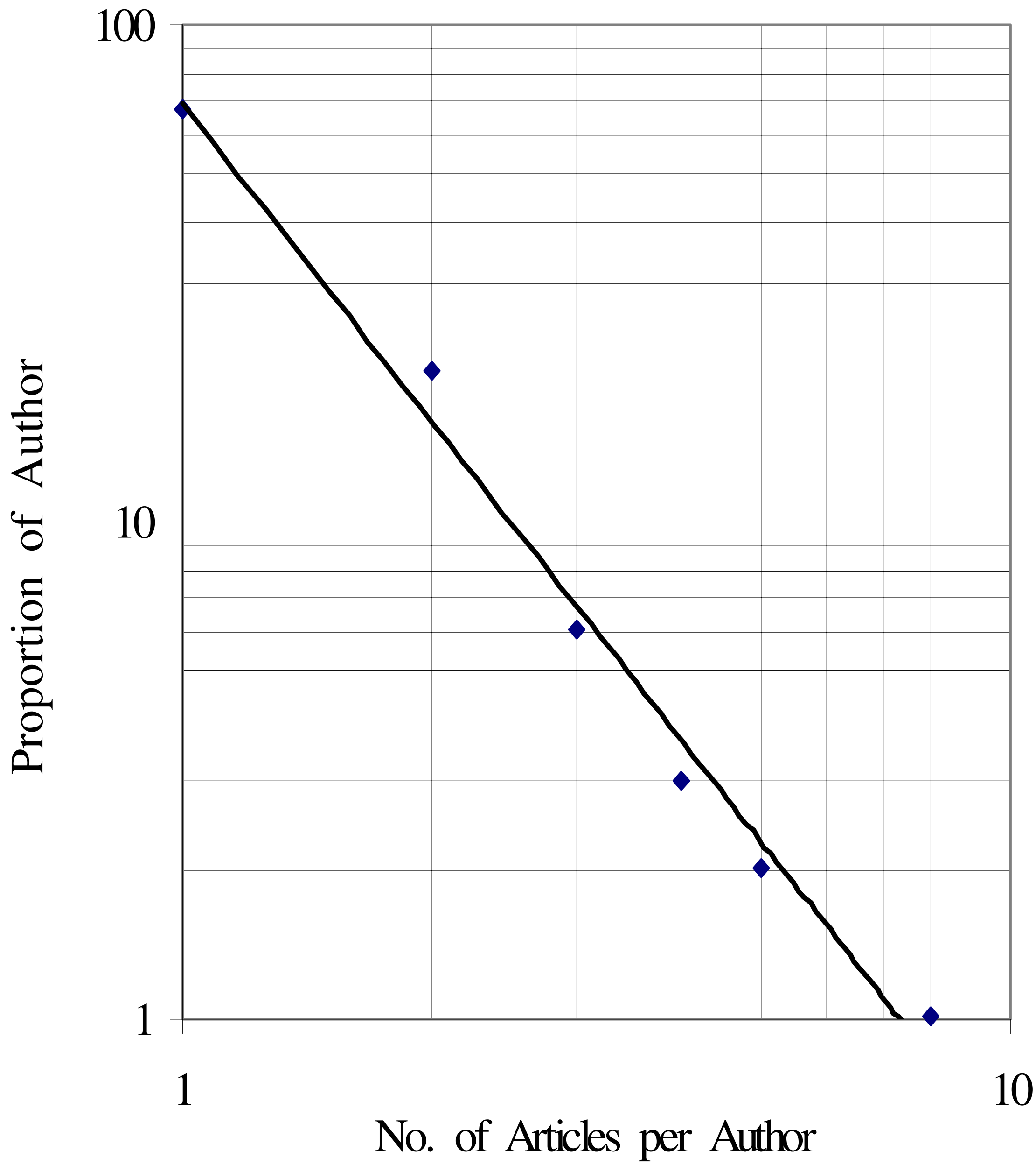

Figure1. Lotka Analysis: Log/log Chart
Pre-Vatican II

The calculations show that the data on author publication before Vatican II is a good fit to Lotka's Law.

Lotka Analysis Post-Vatican II

Table 19 shows the results of the Lotka test for the post-Vatican II years.

Table 19

Lotka Analysis: Post-Vatican II

No. Articles per Author	Observed No. of Authors	Observed % of Authors	Predicted % of Authors
x		*y*	*y′*
1	147	80.33	94.18
2	28	15.30	11.08
3	6	3.28	3.17
4	2	1.09	1.30
Total	183		

Note.

Lotka Formula: $c = yx^n$

where: y = No. of authors publishing x articles

(c and n are parameters to be determined by regression analysis)

y' = The predicted y value using the regression formula.

Linear "Least Squares" Regression Analysis Results:

$n = 3.0867$, and $c = 94.1780$.

Using the values of n and c as determined by the least squares regression analysis the Lotka formula becomes:

$94.1780 = yx^{3.0867}$

The values for each y' (the predicted y value) are shown in column 4 of the table.

The data is converted into a log/log chart to visually compare the fit to a perfect Lotka distribution, which would show the data very close to the straight line.

Figure 2 shows the log/log chart for the post-Vatican II period. Note that the data is described as a proportion of authors.

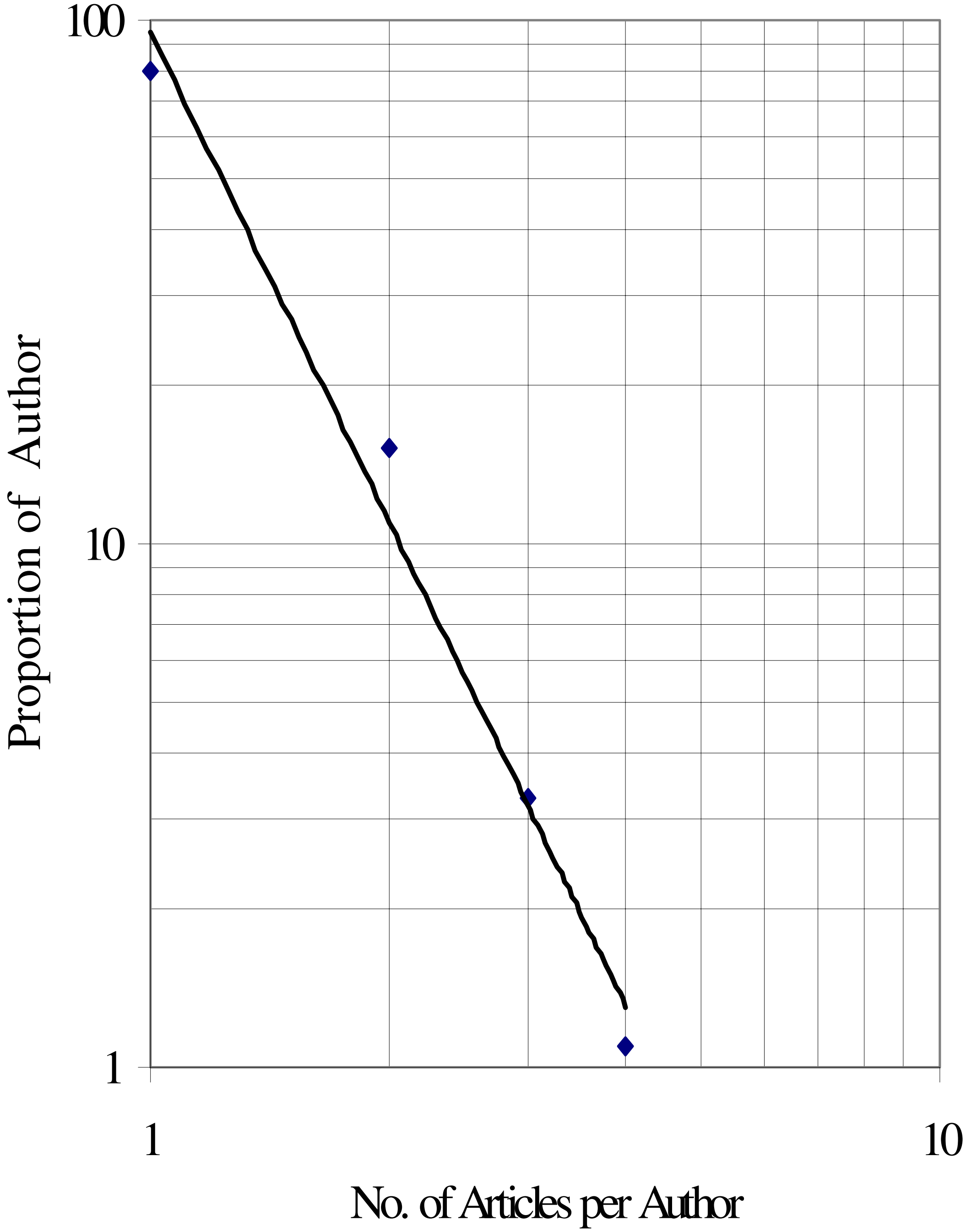

Figure 2. Lotka Analysis: Log/log Chart
Post-Vatican II

Figure 2 shows that the data points lie too far from the straight line for the data from the post-Vatican II period to be a good fit to the Lotka Law.

Lotka Analysis: Pre- and Post-Vatican II

Table 20 shows the results of the test for Lotka's Law for the pre- and post-Vatican II years as a whole.

Table 20

Lotka Analysis: Pre- and Post-Vatican II

No. Articles per Author	Observed No. of Authors	Observed % of Authors	Predicted % of Authors
x		*y*	*y′*
1	201	74.17	78.17
2	48	17.71	12.83
3	13	4.80	4.46
4	4	1.48	2.10
5	2	0.74	1.18
6	0	0.00	0.73
7	2	0.74	0.49
8	1	0.37	0.35

Note.

Lotka Formula: $c = yx^n$

where: y = No. of authors publishing x articles,

(c and n are parameters to be determined by regression analysis)

y' = The predicted y value using the regression formula.

Linear "Least Squares" Regression Analysis Results:

$n = 2.6075$, and $c = 78.1700$

Using the values of n and c as determined by the least squares regression analysis the Lotka formula becomes:

$78.17 = yx^{2.6075}$

The values for each y' (the predicted y value) are shown in column 4 of the table.

The data is converted into a log/log chart to visually compare the fit to a perfect Lotka distribution, which would show the data very close to the straight line.

Figure 3 shows the log/log chart for the pre- and post-Vatican II period. Note that the data is described as a proportion of authors.

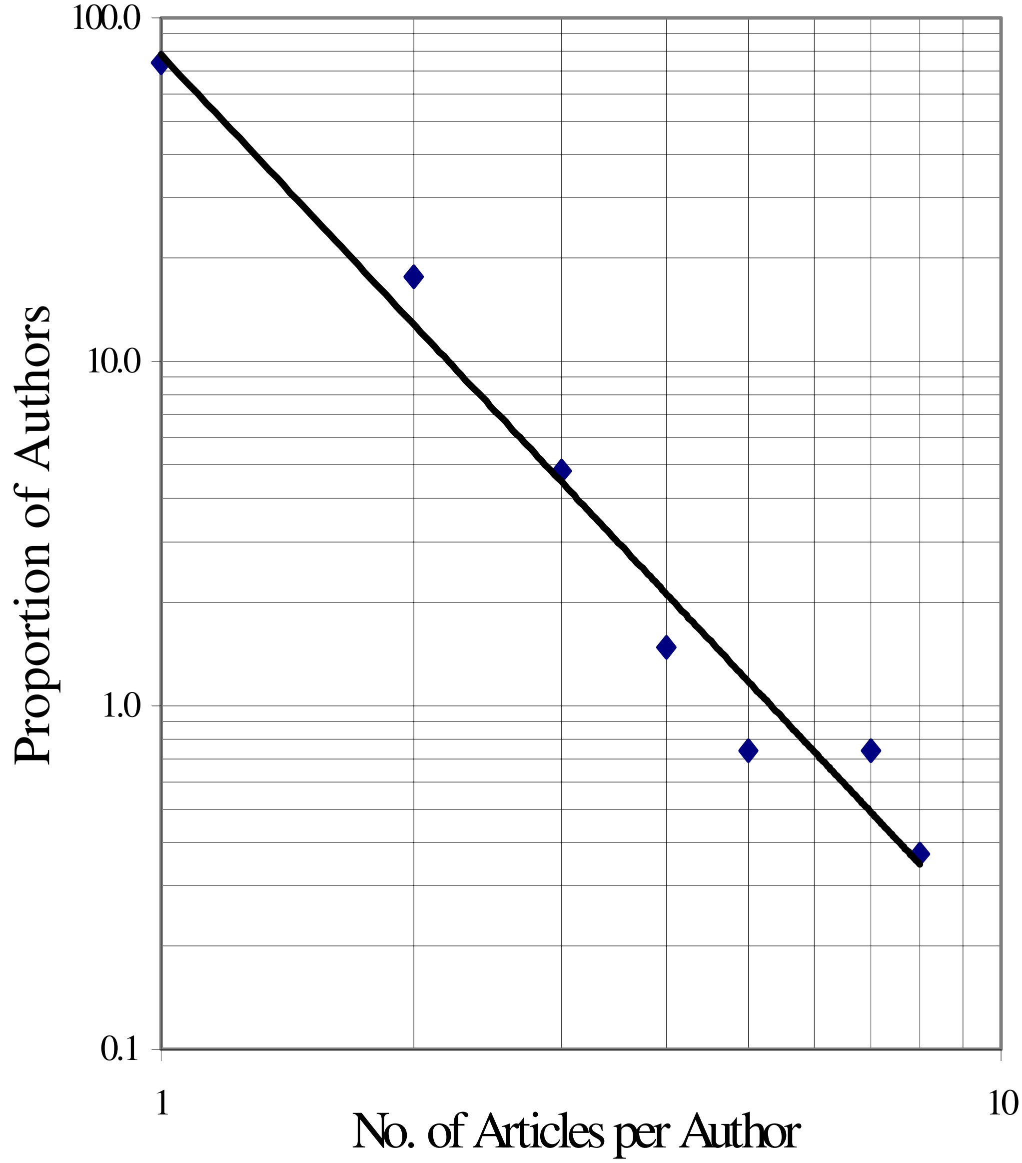

Figure 3. Lotka Analysis: Log/log Chart
Pre- and Post-Vatican II

Figure 3 shows that four of the data points lie too far from the straight line for the data from the post-Vatican II period to be a good fit to the Lotka Law.

Technical Features of the Journal

The analysis of the technical features of the journal concentrated on the editorial content of the journal. The purpose of the analysis was to discover the distinctive characteristics of the journal in terms of (a) total pages, (b) number of articles, (c) number of pages devoted to articles, and (d) number of pages devoted to other material. All issues of the journal for the years 1940-1995 were used in the analysis of the technical features.

Analysis of the Pages

Table 21 shows the results of the analysis of the number of pages published in the journal from 1940-1995. The periods before and after Vatican II are sub-divided into four time spans, representing seven-year intervals. These time spans were added to the analysis so that any subtle changes in the technical features of the journal could be tracked over smaller periods of time.

Table 21

Number of Pages: Pre- and Post-Vatican II

Time Period	No. of Pages In Each Period	No. of Pages Devoted to Articles	% of Pages Devoted to Articles	No. of Pages Devoted to Other Material	% of Pages Devoted to Other Material
Pre-Vatican II:					
1940-1946	4,130	2,794	67.7	1,336	32.3
1947-1953	4,575	1,880	41.1	2,695	58.9
1954-1960	4,673	1,832	39.2	2,841	60.8
1961-1967	5,298	2,044	38.6	3,254	61.4
Total	18,676	8,550	45.8	10,126	54.2
Post-Vatican II:					
1968-1974	5,501	2,432	44.2	3,069	55.8
1975-1981	5,566	2,453	44.1	3,113	55.9
1982-1988	5,427	2,345	43.2	3,082	56.8
1989-1995	5,650	3,121	55.2	2,529	44.8
Total	22,144	10,351	46.7	11,793	53.3
Grand Total	40,820	18,901	46.3	21,919	53.7

Theological Studies published a total of 40,820 pages from 1940-1995. Of this total, 18,676 pages were published before Vatican II and 22,144 pages were published after Vatican II, an increase of 18.6%. In all but one of the seven-year time periods (1982-1988), the number of pages increased over the previous period.

When the proportion of pages devoted to articles is compared to the proportion of pages devoted to other material in the different time-periods, articles took precedence in the initial years of the journal (1940-1946) by a large margin, forming about two-thirds of its content. After 1946 the percentage of pages assigned to articles fell to below 50% of the total pages and remained at that level until the 1989-1995 time-period, when the percentage of pages devoted to articles rose again to above 50%.

Analysis of the Technical Features: Articles

Table 22 shows the analysis of the number of articles from 1940-1995. The volumes were divided for the period before and after Vatican II and these periods are condensed into four time-spans, each containing seven years.

Table 22

Number of Articles: Pre- and Post-Vatican II

Time Period	No. of Articles	Articles per Issue		Pages per Article	
Pre-Vatican II:		Average	SD	Average	SD
1940-1946	112	4.0	1.0	25.7	6.9
1947-1953	61	2.2	0.8	31.7	11.4
1954-1960	56	2.0	0.7	35.7	14.5
1961-1967	77	2.8	1.1	28.8	14.1
Total	306	2.7		30.5	
Post-Vatican II:					
1968-1974	103	3.7	1.6	24.5	6.5
1975-1981	95	3.4	1.3	27.1	8.6
1982-1988	100	3.6	0.9	23.9	4.5
1989-1995	132	4.7	1.5	24.2	3.7
Total	430	3.8		24.9	
Grand Total	736	3.3		27.7	

Table 22 shows that Theological Studies published a total of 736 articles from 1940 to 1995. There were 306 articles published before Vatican II and 430 articles published after Vatican II, an increase of about 40% after Vatican II. The journal began publication with an average of four articles per issue but that average dropped to less than three per issue for the next 21 years. Column 5 of Table 22 shows that beginning in the period 1961-1967, the articles became shorter. The number of pages devoted to articles however, increased by 21% after Vatican II while the number of pages devoted to other material increased by 16%. (See Table 21)

Subject Dispersion of the Literature

Two of the research questions of the study addressed the subject-dispersion of the cited journals: (a) what was the extent of subject-dispersion in this literature, (b) to what extent do authors cite from different disciplines before and after Vatican II?

An analysis of the subject-dispersion of a literature indicates the dependence of a scholar working in the field on published materials in related fields. In low subject-dispersion a discipline uses 61-71% of its own literature and only 29-39% of literature outside of its own field. Disciplines that use over 71% of their own literature are considered "subject bound" (Stevens, 1953). According to Stevens, a discipline that has a high subject-dispersion uses only 29 to 39% of its own literature and 61-71% from outside of its own field.

Library of Congress Classification by Subject

In order to test for the subject dispersion of the cited journals, the Library of Congress subject classification for each cited journal was entered as its subject.

Table 23 presents the results of the subject dispersion analysis for the periods before and after Vatican II. The subjects are classified into two areas for this table: theological materials and non-theological materials. The Library of Congress class "B" includes works of psychology and philosophy, which for this study were considered to be non-theological materials.

Table 23

Subject Dispersion: Pre- and Post-Vatican II

Before Vatican II			After Vatican II		
LC Class	No. of Citations	% of Citations	LC Class	No. of Citations	% of Citations
Theology:			Theology:		
BJ-Ethics	3	0.2	BD-Speculative Theol	5	0.1
BL-Religions	29	1.5	BJ-Ethics	16	0.5
BM-Judaism	5	0.3	BL-Religions	99	2.9
BQ-Buddhism	29	1.5	BM-Judaism	3	0.1
BR-Christianity	228	11.5	BQ-Buddhism	26	0.8
BS-Bible	122	6.2	BR-Christianity	402	11.7
BT-Doctrine	248	12.5	BS-Bible	107	3.1
BV-Practical	44	2.2	BT- Doctrine	264	7.7
BX-Denominat'ns	735	37.1	BV-Practical	72	2.1
BXZ-Sects	3	0.2	BX- Denominat'ns	1,469	42.9
			BXZ-Sects	3	0.1
Total	1,446	73.0	Total	2,466	72.0
Non-theology:		0.0	Non-theology:		
A-General Wks	114	5.8	A-General Wks	132	3.9
B-Philosophy	177	8.9	B-Philosophy	308	9.0
BF-Psychology	2	0.1	BF-Psychology	64	1.9
C-History, Aux Sci	1	0.1	C-History, Aux Sci	2	0.1
D-Hist'y, Europe	18	0.9	D-History, Europe	70	2.0
F-Hist'y, America	4	0.2	E-History, America	1	0.0
G-Geography	15	0.8	F-History, America	2	0.1
H-Social Science	11	0.6	G-Geography	32	0.9
J-Political Sci	7	0.4	H-Social Science	84	2.5
K-Law	1	0.1	J-Politic'l Science	24	0.7
L-Education	1	0.1	K-Law	24	0.7
N-Fine Arts	1	0.1	L-Education	9	0.3

P-Literature	19	1.0	M-Music	3	0.1
Q-Science	13	0.7	N-Fine Arts	2	0.1
R-Medicine	71	3.6	P-Lang/Literature	25	0.7
T-Technology	40	2.0	Q-Science	61	1.8
U-Military Sci	1	0.1	R-Medicine	48	1.4
Z-Lib/ Inf Science	10	0.5	T-Technology	5	0.1
			U-Military Science	1	0.0
			Z-Lib/Inf Science	3	0.1
Total	506	25.6	Total	900	26.3
Unknown	28	1.4	Unknown	61	1.7
	1,980	100.0		3,427	99.9

In both periods, the use of literature other than that of theology is very low. The "B" class, represents theology and accounts for 73% of the sources before Vatican II and 72% of the sources after Vatican II. In both periods, citations to non-theological materials accounted for only about 25%.

Citations to the journals on the subject of philosophy (B) received the most citations in the non-theological class because philosophy is so closely related to theology. Citations to science journals (Q) increased from 0.7% before Vatican II to almost 2% of the total after Vatican II. Several other subjects increased in representation after Vatican II: Social Sciences (H) increased from 0.6% to 2.5% and use of psychology (BF) literature increased from 0.1% to almost 2%.

Table 24 shows the subject classification of the cited journals in the pre- and post-Vatican II years, analyzed as a whole.

Table 24

Subject Dispersion: Pre- and Post-Vatican II

LC Class	No. of Citations	% of Citations
Theology		
BD-Speculative	5	0.1
BJ-Ethics	19	0.4
BL-Religions	128	2.4
BM-Judaism	8	0.1
BQ-Buddhism	55	1.0
BR-Christianity	630	11.7
BS-Bible	229	4.2
BT-Doctrine	512	9.5
BV-Practical	116	2.1
BX-Denominations	2,204	40.8
BXZ-Sects	6	0.1
Total	3,912	72.4
Non-theology		
A-General Periodicals	246	4.5
B-Philosophy	485	9.0
BF-Psychology	66	1.2
C-History, Aux'y Sci	3	0.1
D-History, Europe	88	1.6
E-History, America	1	0.0
F-History, America	6	0.1
G-Geography	47	0.9
H-Social Science	95	1.8
J-Political Science	31	0.6
K-Law	25	0.5
L-Education	10	0.2
M-Music	3	0.1
N-Fine Art	3	0.1
P-Literature	44	0.8
Q-Science	74	1.4

R-Medicine	118	2.2
T-Technology	45	0.8
U-Military Science	2	0.0
Z-Library, Inf. Science	13	0.2
Total	1,405	26.0
Unknown	90	1.6
	5,407	99.9

The research shows that the authors preferred the literature found in "BX" for most of their theological research. This is the subject class in which Catholicism appears. In the non-theological category, they prefer the literature of philosophy and general works.

Table 25 shows the subject dispersion for the literature in the pre- and post Vatican II time periods. The subjects are classified into two areas for this table: theological materials and non-theological materials. "Unknown" refers to journals which were not classified by the Library of Congress. The subject class "B" includes works of psychology and philosophy, which for this study were considered to be non-theological materials.

Table 25

Summary of Subject Class (Theology and Non-Theology): Pre- and Post-Vatican II

Subject Class	Pre-Vatican II (%)	Post-Vatican II (%)	Pre- and Post-Vatican II (%)
Theology	73.0	72.0	72.4
Non-theology	25.6	26.3	26.0
Unknown	1.4	1.7	1.6
Total	100.0	100.0	100.0

Sources whose subject class was theology were used for 73% of the citations before Vatican II and 72% of the citations after Vatican II, showing that the subject dispersion is very low for this literature. Only about 26% of the sources were from subject classes that were non-theological in nature for the pre- and post-Vatican II years analyzed as a whole.

Bradford Analysis of Title Dispersion

Following Bradford's formula (see Appendix C), the number of journals and the number of times each had been cited were analyzed. The journals were then ranked by the number of citations each produced.

A 5-column table was constructed so that each line represented a single rank. Column 1 shows the number of journal titles. Column 2 shows the number of citations contributed by each of the journals. Column 3 shows the cumulative number of journal titles and column 4 shows the cumulative number of citations. Column 5 shows the cumulative percentage of citations

While retaining the order of the journals, the list was divided into three groups so that the number of articles produced by each group of journals was approximately the same. These zones were identified as a) the “nucleus”, b) Zone 2, and c) Zone 3. The nucleus contains the “core" journals, or most-cited journals; and the journals in Zones 2 and 3 respectively, as the lesser productive and least productive.

Bradford stated that the three zones would have a mathematical relationship if they adhered to his law. The number of journal titles in each zone could then be predicted. In order to test whether the number of journals that were observed in the three zones were the same number of journals that Bradford predicted, the Bradford formula is applied.

The results of the Bradford test for title dispersion will be reported in three sections. Each section covers the Bradford test of title dispersion for one of the time-periods under study. Within each section are: (a) the appropriate tables from which division into the Bradford zones was made, (b) a summary of the calculations which produced the results of the Bradford test for the observed data vs. the predicted data, and (c) the Bradford bibliograph showing the shape of the Bradford curve. The full calculations for the formula as it was applied to the data from each section are found in Appendix C.

Table 26 shows the number of journal titles and the number of citations for the pre-Vatican II years.

Table 26

<u>Journal Titles and Number of Citations: Pre-Vatican II</u>

Citations/Title	No. of Titles	Cumulative No. of Titles	Cumulative No. of Citations	Cumulative % of Citations
258	1	1	258	13.0
67	1	2	325	16.4
62	1	3	387	19.5
51	1	4	438	22.1
50	1	5	488	24.6
48	1	6	536	27.1
46	1	7	582	29.4
40	1	8	622	31.4
37	1	9	659	33.3

34	2	11	727	36.7
30	1	12	757	38.2
29	1	13	786	39.7
28	1	14	814	41.1
22	2	16	858	43.3
21	1	17	879	44.4
19	1	18	898	45.4
17	5	23	983	49.6
15	4	27	1,043	52.7
14	2	29	1,071	54.1
13	2	31	1,097	55.4
12	3	34	1,133	57.2
11	5	39	1,188	60.0
10	4	43	1,228	62.0
9	6	49	1,282	64.7
8	9	58	1,354	68.4
7	11	69	1,431	72.3
6	14	83	1,515	76.5
5	18	101	1,605	81.1
4	20	121	1,685	85.1
3	29	150	1,772	89.5
2	45	195	1,862	94.0
1	118	313	1,980	100.0

Dividing the tables into cumulative percentages of one-third each, the first 9 journal titles produce the nucleus (33.3%). Zone 2 ends at 64.7%, and contains 40 journal titles. Zone 3 is represented by the rest of the journal titles.

Table 27 shows the result of the calculations of the Bradford formula for the pre-Vatican II years.

Table 27

<u>Bradford Calculations: Pre-Vatican II</u>

Zone	Predicted	Observed	[a] Observed Bradford Multiplier
Nucleus	9	9	--
Zone 2	40	40	4.44
Zone 3	177	264	[b]5.41

Observed number of citations per zone:
  Nucleus: 659 citations
  Zone 2: 623 citations
  Zone 3: 692 citations

Predicted Series: Nucleus = 9 journals
  Zone 2 = (9 x 4.44) or 40 journals
  Zone 3 = (9 x 4.44^2) or 177 journals
Observed Series: Nucleus = 9 journals
  Zone 2 = (9 x 4.44) or 40 journals
  Zone 3 = (9 x 5.41^2) or 264 journals

[a]Bradford multipler: the number of journals in the nucleus divided into the number of journals in Zone 2, or 4.44
[b]The Bradford multiplier that is suggested by the observed data is 5.41, rather than 4.44

The Bradford multiplier is derived from the formula: $1{:}n{:}n^2$ . . . The Bradford multiplier for the data in Table 27 is the number of journals in the nucleus divided into the number of journals in Zone 2, or 4.44.

Using the same Bradford multiplier to predict the number of journal titles in each zone, the number in the nucleus and Zone 2 meet the expectation for the predicted number of journal titles. The predicted number of journals titles in Zone 3 was 177. The observed number of journals in Zone 3 was 264, suggesting that the Bradford multiplier is 5.41, rather than 4.44.

As seen from the table, the nucleus and Zone 2 were correctly predicted but the observed number of journal titles in Zone 3 was much larger than the law predicted. The data was a poor fit to Bradford's Law.

Figure 4 is a display of the Bradford bibliograph, which is derived from plotting the data as a log/log chart.

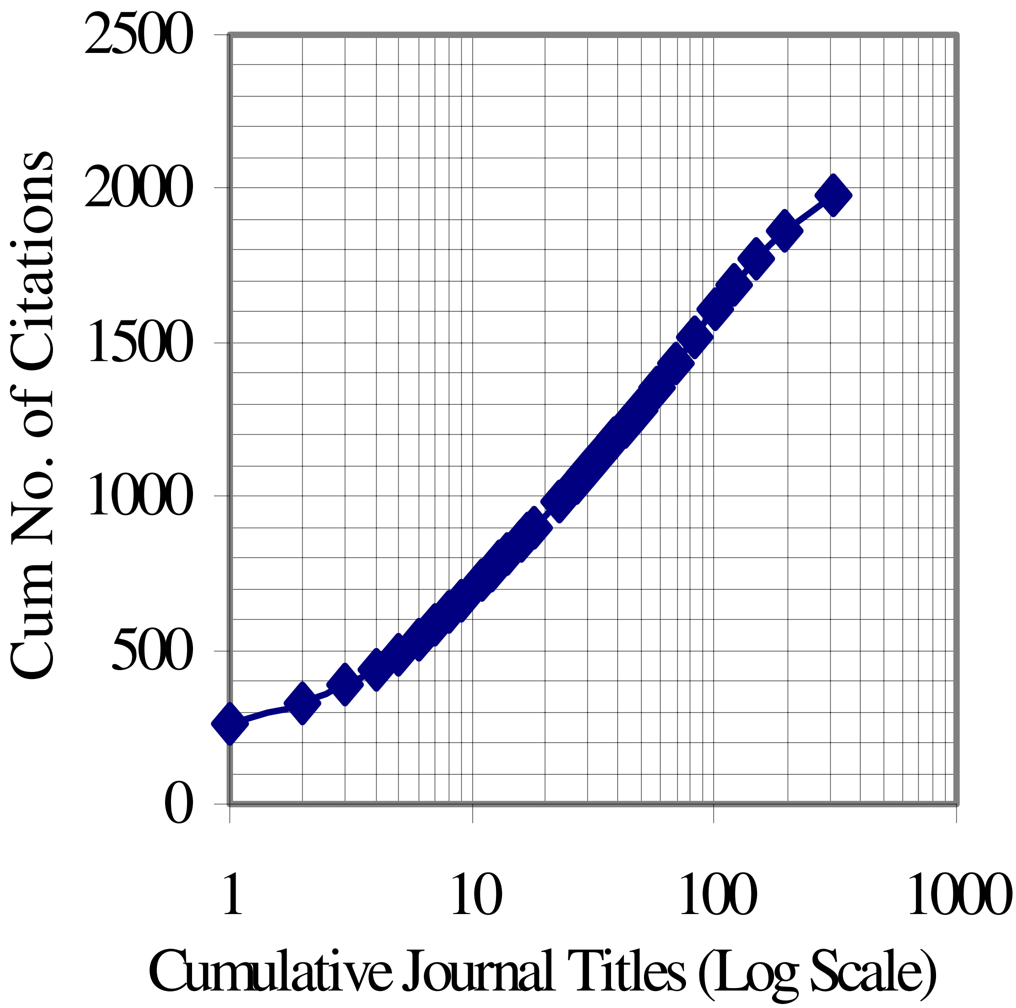

Figure 4. Bradford Bibliograph
Pre-Vatican II

Once again, the graph shows a good fit. The nucleus may be too big.

Table 28 shows the number of journal titles and the number of citations for the post-Vatican II years.

Table 28

Journal Titles and Number of Citations: Post-Vatican II

Citations/Title	No. of Titles	Cumulative No. of Titles	Cumulative No. of Citations	Cumulative % of Citations
440	1	1	440	12.8
126	1	2	566	16.5
61	1	3	627	18.3
52	1	4	679	19.8
50	1	5	729	21.3
44	2	7	817	23.8
38	2	9	893	26.1
37	1	10	930	27.1
36	1	11	966	28.2
32	1	12	998	29.1
31	1	13	1,029	30.0
29	1	14	1,058	30.9
28	3	17	1,142	33.3
27	4	21	1,250	36.5
26	1	22	1,276	37.2
25	2	24	1,326	38.7
24	1	25	1,350	39.4
23	6	31	1,488	43.4
22	1	32	1,510	44.1
21	1	33	1,531	44.7
20	2	35	1,571	45.8
19	4	39	1,647	48.1
18	3	42	1,701	49.6
17	6	48	1,803	52.6

16	4	52	1,867	54.5
15	2	54	1,897	55.4
14	7	61	1,995	58.2
13	7	68	2,086	60.9
12	2	70	2,110	61.6
11	6	76	2,176	63.5
10	8	84	2,256	65.8
9	8	92	2,328	67.9
8	8	100	2,392	69.8
7	15	115	2,497	72.9
6	14	129	2,581	75.3
5	23	152	2,696	78.7
4	34	186	2,832	82.6
3	50	236	2,982	87.0
2	98	334	3,178	92.7
1	249	583	3,427	100.0

After Vatican II, 17 journals were in the nucleus, (the first one-third of the cumulative percentages column, at 33.3%), and 67 journals are in Zone 2, (the second one-third of the cumulative percentage column at 65.8%). Zone 3 contains the rest of the journal titles.

Table 29 shows the result of the calculations of the Bradford formula for the post-Vatican II years.

Table 29

<u>Bradford Calculations: Post-Vatican II</u>

Zone	Predicted	Observed	[a] Observed Bradford Multiplier
Nucleus	17	17	--
Zone 2	67	67	3.94
Zone 3	264	499	[b]5.41

Observed Number of Citations per Zone:
Nucleus: 1,142 citations;
Zone 2: 1,114 citations;
Zone 3: 1,171 citations

Predicted Series: Nucleus = 17 journals
Zone 2= (17 x 3.94) or 67 journals
Zone 3= (17 x 3.94^2) or 264 journals

Observed Series: Nucleus = 17 journals
Zone 2= (17 x 3.94) or 67 journals
Zone 3= (17 x 5.41^2) or 499 journals

[a] Bradford multiplier : the number of journals in the nucleus divided into the number of journals in Zone 2 or 3.94
[b] The Bradford multiplier that is suggested by the observed data or 5.41 rather than 3.94

The Bradford multiplier is derived from the formula: $1{:}n{:}n^2$ . . . The Bradford multiplier for the data in Table 29 is the number of journals in the nucleus divided into the number of journals in Zone 2, or 3.94.

Using the same Bradford multiplier to predict the number of journal titles in each zone, the number in the nucleus and Zone 2 meet the expectation for the predicted number of journal titles. The predicted number of journal titles in Zone 2 was 67. The observed number of journals in Zone 3 was 499, suggesting that the Bradford multiplier is 5.41, rather than 3.94.

As seen from the table, the nucleus and Zone 2 were correctly predicted but the observed number of journal titles in Zone 3 was much larger than the law predicted. The data was a poor fit to Bradford's Law.

Figure 5 is a display of the Bradford bibliograph, which is derived from plotting the data as a log/log chart.

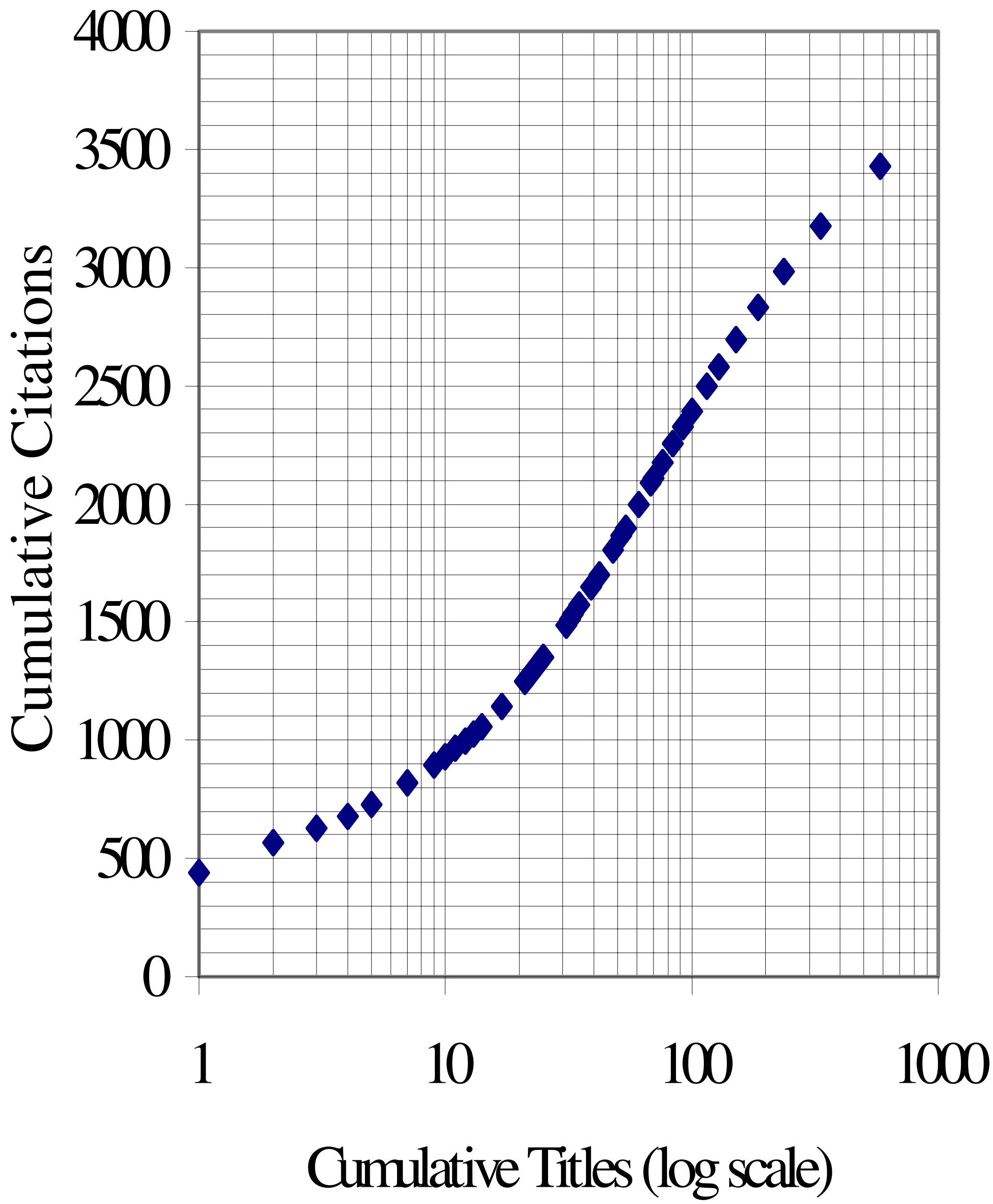

Figure 5. Bradford Bibliograph Post-Vatican II

The chart shows the typical Bradford "J" curve.

Table 30 shows the number of journal titles and the number of citations for the pre- and post-Vatican II years, analyzed as a whole.

Table 30

Journal Titles and Number of Citations: Pre- and Post-Vatican II

Citations/ Title	No. of Titles	Cumulative No. of Titles	Cumulative No. of Citations	Cumulative % of Citations
698	1	1	698	12.9
126	1	2	824	15.2
99	1	3	923	17.1
90	1	4	1,013	18.7
89	1	5	1,102	20.4
78	1	6	1,180	21.8
74	1	7	1,254	23.2
69	1	8	1,323	24.5
61	1	9	1,384	25.6
59	1	10	1,443	26.7
58	1	11	1,501	27.7
57	1	12	1,558	28.8
53	1	13	1,611	29.8
51	3	16	1,764	32.6
48	1	17	1,812	33.5
46	1	18	1,858	34.3
43	1	19	1,901	35.1
42	2	21	1,985	36.7
40	1	22	2,025	37.4
39	1	23	2,064	38.1
38	2	25	2,140	39.5
36	1	26	2,176	40.2
35	2	28	2,246	41.5
34	1	29	2,280	42.1
33	1	30	2,313	42.7

32	1	31	2,345	43.3
31	1	32	2,376	43.9
30	1	33	2,406	44.5
29	4	37	2,522	46.6
27	4	41	2,630	48.6
26	2	43	2,682	49.6
25	3	46	2,757	51.0
24	2	48	2,805	51.8
23	3	51	2,874	53.1
22	5	56	2,984	55.1
20	5	61	3,084	57.0
19	2	63	3,122	57.7
18	3	66	3,176	58.7
17	6	72	3,278	60.6
16	4	76	3,342	61.8
15	5	81	3,417	63.1
14	10	91	3,557	65.7
13	6	97	3,635	67.2
12	6	103	3,707	68.5
11	10	113	3,817	70.5
10	11	124	3,927	72.6
9	15	139	4,062	75.1
8	20	159	4,222	78.0
7	14	173	4,320	79.8
6	27	200	4,482	82.8
5	28	228	4,622	85.4
4	42	270	4,790	88.5
3	45	315	4,925	91.0
2	112	427	5,149	95.2
1	262	689	5,411	100.0

Table 30 shows that for the pre- and post-Vatican II periods, 17 journal titles form the nucleus (at 33.5%). Zone 2 contains 80 journals (at 67.2)%. The remaining journals form Zone 3.

Table 31 shows the results of the calculations of the Bradford formula for the pre- and post-Vatican II years.

Table 31

Bradford Calculations: Pre- and Post-Vatican II

Zone	Predicted	Observed	[a]Observed Bradford Multiplier
Nucleus	17	17	--
Zone 2	80	80	4.70
Zone 3	376	592	[b]5.90

Articles per Zone:
Nucleus, 1,812 articles;
Zone 2, 1,823 articles;
Zone 3, 1,776 articles

Predicted Series: Nucleus = 17 journals
Zone 2 = (17 x 4.70) or 80 journals
Zone 3 = (17 x 4.70^2) or 376 journals

Observed Series: Nucleus = 17 journals
Zone 2 = (17 x 4.70) or 80 journals
Zone 3 = (17 x 5.90^2) or 592 journals

[a]Bradford multipler: the number of journals in the nucleus divided into the number of journals in Zone 2, or 4.70
[b]The Bradford multiplier that is suggested by the observed data is 5.90, rather than 4.70

The Bradford multiplier is derived from the formula: $1{:}n{:}n^2$ . . . The Bradford multiplier for the data in Table 31 is the number of journals in the nucleus divided into the number of journals in Zone 2, or 4.70.

Using the same Bradford multiplier to predict the number of journal titles in each zone, the number in the nucleus and Zone 2 meet the expectation for the predicted number of journal titles. The predicted number of journals titles in Zone 3 was 376. The observed number of journals in Zone 3 was 592, suggesting that the Bradford multiplier is 5.90, rather than 4.70.

As seen from the table, the nucleus and Zone 2 were correctly predicted but the observed number of journal titles in Zone 3 was much larger than the law predicted. The data was a poor fit to Bradford's Law.

Figure 6 is a display of the Bradford bibliograph for the pre- and post-Vatican II years.

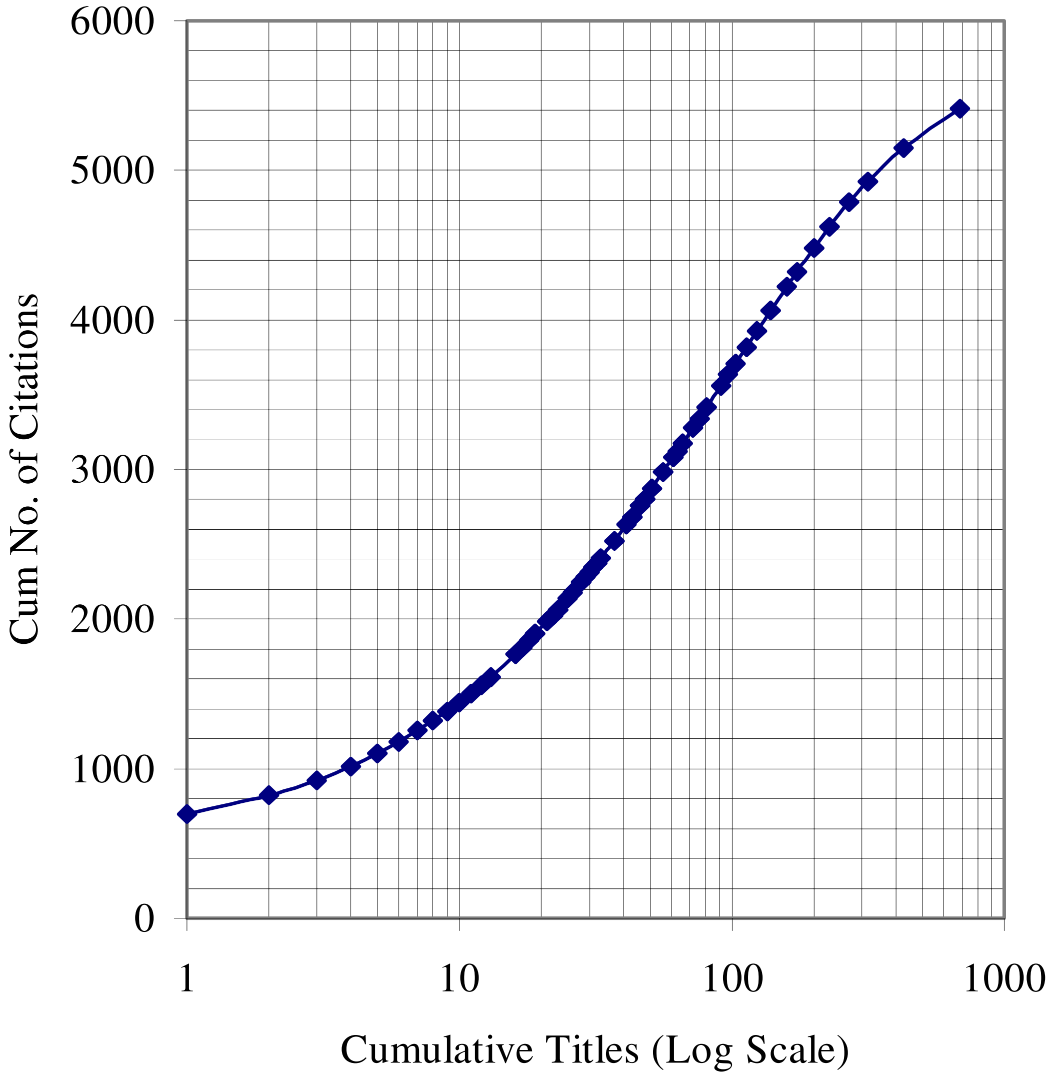

Figure 6. Bradford Bibliograph: Pre- and Post- Vatican II

The cumulated graph of the Bradford's Law for the journal titles for the pre- and post-Vatican II period appears to be a better fit than the table calculations. The cause of this may be that when the data was tabulated, like the pre- and post- Vatican II time periods, too many citations were partitioned into the nucleus.

Characteristics of the Citations

The citations were analyzed for the following characteristics: (a) year of publication, (b) format, (c) language, (d) name of principal author, (e) names of co-authors, (f) names of editors, (g) place of publication, (h) notation for an author or journal self-citation, (i) title of cited journal, and (j) Library of Congress subject class for the cited journal. Data was gathered on each of the characteristics and any differences in the pre-Vatican II period and the post-Vatican II period are reported in this section.

There were 384 articles in Theological Studies that were used as a data source for this part of the study. The total number of citations collected from these articles was 25,808.

Age Distribution of the Cited Works

The research questions concerning the age of the cited works addressed the following characteristics: (a) what was the average age of the cited document, (b) had the average age of the cited document changed since Vatican II, (c) were specific years or spans of years more cited than others, (d) were specific years or spans of years more cited before Vatican II, and (e) were specific years or spans of years more cited than others after Vatican II?

The year of publication of the cited work was compared to the year of the citing document in order to find out how old the work was when the author cited it. The result of this analysis is shown in "time-span" tables which contain the percentage of citations that were 0-5 years old, 6 to 10 years old, and so on for that time-period.

The date of the cited work was taken from the citation itself unless the citation was to a reprint of an older work. In that case, the date of the older work was used instead. Serials cited with dates that were a range of years rather than a single date were considered to be published in the mid-point of that range.

Table 32 shows the age of the cited works for the pre-Vatican II years.

Table 32

Age of the Cited References: Pre-Vatican II

Age of Cited Reference(Years)	No. of Citations	% of Citations	Cumulative % of Citations
0 - 5	2,786	34.1	34.1
6 - 10	1,308	16.0	50.1
11 - 15	737	9.0	59.1
16 - 20	618	7.6	66.6
21 - 25	447	5.5	72.1
26 - 30	397	4.9	77.0
31 - 40	524	6.4	83.4
41 - 50	338	4.1	87.5
51 - 60	264	3.2	90.7
61 - 70	211	2.6	93.3
71 - 120	176	2.2	95.5
121 - 170	93	1.1	96.6
171 - 270	204	2.5	99.1
271 - 370	60	0.7	99.8
371 - 470	13	0.2	100.0

Above 470	2	0.0	100.0
Total	8,178	100.0	
Unknown	330		
Grand Total	8,508		

Before Vatican II, 50.1% of the cited works were less than 10 years old. Works that were less than 30 years old provided 77% of the citations and those less than 60 years old provided over 90% of the citations.

Table 33 shows the result of the analysis for the age of the works in the post-Vatican II years.

Table 33

Age of the Cited Works: Post-Vatican II

Age of Cited Reference (Years)	No. of Citations	% of Citations	Cumulative % of Citations
0 - 5	5,379	31.4	31.4
6 - 10	3,562	20.8	52.2
11 - 15	2,210	12.9	65.1
16 - 20	1,513	8.8	73.9
21 - 25	1,139	6.6	80.6
26 - 30	619	3.6	84.2
31 - 40	693	4.0	88.2
41 - 50	465	2.7	91.0
51 - 60	214	1.2	92.2
61 - 70	132	0.8	93.0
71 - 120	866	5.1	98.0
121 - 170	225	1.3	99.3
171 - 270	37	0.2	99.6
271 - 370	16	0.1	99.7
371 - 470	56	0.3	100.0
Above 470	3	0.0	

Total	17,129	
Unknown	171	
Grand Total	17,300	100.0

After Vatican II, 91% of the cited works were less than 50 years old, and over 50% of the literature needed to support the authors' research was less than 10 years old. The use of works that were 30 years old or less increased from 77% in the pre-Vatican II years to 84.2% in the post-Vatican II years (See Table 32). There was a "spike" in usage of literature that was 71-120 years old, a period that roughly corresponds to the years 1848-1924.

Table 34 shows the age of the cited works for the pre- and post-Vatican II years.

Table 34

Age of Cited Works: Pre- and Post-Vatican II

Age (Yrs)	No. of Citations	% of Citations	Cumulative % of Citations
0 - 5	8,165	32.3	32.3
6 - 10	4,870	19.2	51.5
11 - 15	2,947	11.6	63.2
16 - 20	2,131	8.4	71.6
21 - 25	1,586	6.3	77.8
26 - 30	1,016	4.0	81.9
31 - 40	1,217	4.8	86.7
41 - 50	803	3.2	89.8
51 - 60	478	1.9	91.7
61 - 70	343	1.4	93.1
71 - 120	1,042	4.1	97.2
121 - 170	318	1.3	98.5
171 - 270	241	1.0	99.4
271 - 370	76	0.3	99.7

371 - 470	69	0.3	100.0
Above 470	5	0.0	100.0
Total	25,307	100.0	
Unknown	501		
Grand Total	25,808		

For the pre- and post-Vatican II years, over 90% of the cited works were less than 60 years old. About 50% of them were less than 10 years old when cited.

Average Age and Most-Cited Year of the Cited Works

One of the research questions was concerned with the average age and the most-cited years before and after Vatican II. Table 35 presents the results of that analysis for the time period preceeding Vatican II and the time-period after Vatican II.

Table 35

Average Age and Most-Cited Years: Pre- and Post-Vatican II

Age	Pre-Vatican II	Post-Vatican II
Average Age (in years)	27	21
Most-Cited Year (year)	1956	1966

The average age of the cited work in both the pre- and post-Vatican II years was between 21 and 27 years old. The most-cited years in both periods is about the middle of the 20th century, 1956 and 1966.

Format of the Cited Works

Three research questions were proposed in Chapter 1 concerning the use of various formats by the authors: (a) what were the most-cited formats used in the cited documents, (b) what were the most-cited formats used before Vatican II, and (c) what were the most-cited formats used after Vatican II?

Table 36 shows the formats that were preferred by the authors before and after Vatican II.

Table 36

Format of the Cited Works: Pre- and Post-Vatican II

	Pre-Vatican II			Post-Vatican II		
Format	No. of Citations	% of Citations	Cumulative % of Citations	No. of Citations	% of Citations	Cumulative % of Citations
Monograph	3,868	45.5	45.5	10,742	62.1	62.1
Serial	1,964	23.1	68.5	2,504	14.5	76.6
Journal	1,988	23.4	91.9	3,432	19.8	96.4
Dissertation	35	0.4	92.3	88	0.5	96.9
Annual Report	18	0.2	92.5	62	0.4	97.3
Seminar Paper	3	0.0	92.6	16	0.1	97.4
Conference Paper	101	1.2	93.8	92	0.5	97.9
Festschriften	20	0.2	94.0	25	0.1	98.0
Bible Commentary	254	3.0	97.0	107	0.6	98.7
Other	217	2.6	99.5	182	1.1	99.7
Unknown	40	0.5	100.0	50	0.3	100.0
Total	8,508			17,300		

The table shows that authors preferred to cite from monographs about 45% of the time before Vatican II and 62% after Vatican II. They favored serials about 23% of the time before Vatican II but only 14% of the time afterwards. Before Vatican II only 431 citations, or slightly more than 5% of the total citations, referred to formats such as dissertations, festschriften, conference or seminar papers, annual reports, or biblical commentaries. Biblical commentaries accounted for one-half of this 5%.

Both journals and serials were cited less often after Vatican II than they were before Vatican II with journals accounting for only 23.4% of the cited formats before Vatican II and 19.8% afterwards.

Table 37 shows the results of the analysis of formats for the pre- and post-Vatican II years analyzed as a whole.

Table 37

Format of the Cited Works: Pre- and Post-Vatican II

Format	No. of Citations	% of Citations	Cumulative % of Citations
Monographs	14,610	56.6	56.6
Serials	4,468	17.3	73.9
Journals	5,420	21.0	94.9
Dissertation	123	0.5	95.4
Annual Report	80	0.3	95.7
Seminar Paper	19	0.1	95.8
Conference Paper	193	0.7	96.5
Festschriften	45	0.2	96.7
Biblical Commentaries	361	1.4	98.1
Other	399	1.5	99.7
Unknown	90	0.3	100.0
Total	25,808		

For the pre- and post-Vatican II years, the monograph format was preferred 56.6% of the time and 21% of the citations were to journals. The serial was cited in about 18% of the citations. The serial and monograph format combined supplied almost 74% of the cited works.

Language of the Cited Works

The research question concerning the languages used in the cited documents addressed the followingcharacteristics: (a) the predominant languages used before Vatican II, and (b) the predominant languages used after Vatican II.

Table 38 shows the results of the analysis of the languages of the cited works both pre- and post-Vatican II. A "rank" column is also included in this table.

Table 38

Language of Cited Works: Pre-Vatican II and Post-Vatican II

	Pre-Vatican II					Post-Vatican II			
Language	No. of Citations.	% of Citations	Cum. % of Citations	Rank	Language	No. of Citations	% of Citations	Cum % of Citations	Rank
English	3,664	43.1	43.1	1	English	13,394	77.4	77.4	1
French	1,864	21.9	65.0	2	German	2,033	11.8	89.2	2
German	1,389	16.3	81.3	3	French	1,127	6.5	95.7	3
Latin	1,304	15.3	96.6	4	Latin	541	3.1	98.8	4
Spanish	102	1.2	97.8	5	Italian	71	0.4	99.2	5
Italian	80	0.9	98.8	6	Spanish	41	0.2	99.5	6
Dutch	39	0.5	99.2	7	Dutch	16	0.1	99.6	7
Polish	4	0.0	99.3	8	Greek	2	0.0	99.6	8
Swedish	1	0.0	99.3	9	Polish	1	0.0	99.6	9
Greek	0	0.0	99.3	10	Swedish	1	0.0	99.6	10
Unknown	61	0.7	100.0		Unknown	73	0.4	100.0	
Total	8,508				Total	17,300			

Works in English were used for about 43% of the citations before Vatican II, and this percentage rose to over 77% after Vatican II. The number of citations to French works dropped significantly from nearly 22% of the languages cited before Vatican II to slightly over 6% of those cited after Vatican II. The use of German-language sources fell from 16.3% before Vatican II to 11.8% after Vatican II but it was still able to replace French as the second most-cited language of the cited works. Latin fell in usage from 15.3% before Vatican II to 3.1% after Vatican II. Both Italian and Spanish played minor roles in both periods.

Table 39 shows the language of the cited work for the pre- and post-Vatican II years analyzed as a whole.

Table 39

Language of Cited Works: Pre- and Post Vatican II (All Years)

Language	No. of Citations	% of Citations	Cumulative % of Citations
English	17,058	66.1	66.1
German	3,422	13.3	79.4
French	2,991	11.6	90.9
Latin	1,845	7.1	98.1
Italian	151	0.6	98.7
Spanish	143	0.6	99.2
Dutch	55	0.2	99.4
Polish	5	0.0	99.5
Swedish	2	0.0	99.5
Greek	2	0.0	99.5
Unknown	134	0.5	100.0
Total	25,808		

During the pre- and post-Vatican II years, two-thirds of the cited documents were in the English language. Of the remaining one-third, German sources were used 13.3% of the time, and French sources 11.6% of the time. When combined, English, German, French, and Latin sources were responsible for over 98% of all the citations.

Authors of the Cited Works

Tables containing the names of the authors who received the most citations to their works were constructed for each of the three time periods under study. The tables show the ten most-cited authors in each time period.

Table 40 shows the ten most-cited authors before Vatican II.

Table 40

Most-Cited Authors: Pre-Vatican II

Author Name	No. of Citations	Cumulative % of Citations
Lonergan, Bernard	176	2.1
Fuchs, Ernst	135	3.7
Teilhard de Chardin, Pierre	124	5.1
Rahner, Karl	110	6.4
Newman, J. H.	78	7.3
Leclercq, Jean	65	8.1
Tillich, Paul	62	8.8
Morin, Jean	60	9.5
Leroquais, V.	59	10.2
Dibelius, Martin	52	10.8

Note. Total No. of Authors Cited = 2,393
Total No. of Citations = 8,508

These 10 authors were responsible for more than 10% of the cited works and the top four authors produced works that were cited over 6% of the time.

Table 41 shows the ten most-cited authors after Vatican II.

Table 41

Most-Cited Authors: Post-Vatican II

Author Name	No. of Citations	Cumulative % of Citations
Rahner, Karl	1,040	6.0
Balthasar, Hans Urs von	262	7.5
Bultmann, Rudolf	230	8.9
Loisy, A.	219	10.1
Newman, J. H.	206	11.3
Lonergan, Bernard	199	12.5
Moltmann, Jurgen	180	13.5
Kung, Hans	174	14.5
McCormick, Richard A.	145	15.3
Luther, Martin	142	16.2

Note. Total No. of Authors Cited = 4,735
Total No. of Citations = 17,300

Table 41 shows the 10 most-cited authors after Vatican II. The works of one author were cited in about 6% of the citations, about the same citation rate as the top four authors before Vatican II (See Table 40). This one author received nearly five times as many citations as any other author on the list.

Table 42 shows the names of the most-cited authors for the pre- and post-Vatican II years analyzed as a whole.

Table 42

Most-Cited Authors: Pre- and Post-Vatican II

Author Name	No. of Citations	Cumulative % of Citations
Rahner, Karl	1,150	4.5
Lonergan, Bernard	375	5.9
Newman, J. H.	284	7.0
Bultmann, Rudolf	268	8.0
Balthasar, Hans Urs von	266	9.1
Loisy, Alfred	223	9.9
Teilhard de Chardin, Pierre	208	10.7
Moltmann, J.	182	11.5
Kung, Hans	175	12.1
Fuchs, Ernst	160	12.8

Note. Total No. of Authors Cited = 6,735
Total No. of Citations = 25, 808

For the pre- and post-Vatican II years of the study, there were 10 authors whose works were cited more than 12% of the time. One author provided about one-third of this percentage.

Author and Journal Self-Citations

Table 43 shows the number and percentage of author and journal self-citations before Vatican II, after Vatican II, and for the pre- and post-Vatican II years analyzed as a whole. The purpose of the analysis was to show how often theologians cited themselves, and how often they cited the journal in which their work appeared.

Table 43

Author and Journal Self Citation: Pre- and Post-Vatican II

Type	Pre-Vatican II No. of Self-Citations	Pre-Vatican II % of All Citations	Post-Vatican II No. of Self-Citations	Post-Vatican II % of All Citations
Author Self-citation	211	2.5	549	3.2
Journal Self-citation	250	2.9	438	2.5

The results showed that author self-citations accounted for only a small percentage of the citations, less than 3% before Vatican II, and slightly more, 3.2%, after Vatican II.

Authors cited Theological Studies as their source of information in less than 3% of the citations before Vatican II and that percentage dropped slightly after Vatican II to 2.5%.

Analysis of the Edited Works

Table 44 shows the number of citations to edited works.

Table 44

Edited Works: Pre- and Post-Vatican II

	Total Works	Edited Works	% of Citations
Before Vatican II	8,508	337	4.0
After Vatican II	17,300	1,627	9.4
Pre-and Post-Vatican II	25,808	1,964	7.6

Compared to the total number of citations, the number of citations to edited works before Vatican II was very small, only 4%. After Vatican II however, the percentage more than doubled, to nearly 10%. For the pre- and post-Vatican II years, about 8% of the citations were to works that were edited.

Summary of the Citation Characteristics

Table 45 presents a summary of all of the characteristics of the citations before and after Vatican II.

Table 45

Summary of Citation Characteristics: Pre- and Post-Vatican II

Characteristic	% of Citations Pre-Vatican II	% of Citations Post-Vatican II	Percentage Point Change
[a]Subject Dispersion			
Theological Material	82.1	82.8	0.7
Non-theological Material	17.9	17.2	-0.7
Format			
Monograph	45.5	62.1	16.6
Serial	23.1	14.5	-8.6
Journals	23.4	19.8	-3.6
Other	8.0	3.6	-4.4
Language			
English	43.1	77.4	34.3
German	21.9	11.8	-10.1
French	16.3	6.5	-9.8
Latin	15.3	3.1	-12.2
Other	3.4	1.2	-2.2
Place of Publication			
USA	23.5	56.6	33.1
France	18.4	7.6	-10.8
Germany	15.4	12.1	-3.3
England	13.5	8.8	-4.7
Other	29.2	14.9	-14.3

[a]Materials were divided by category

Names of the Most-Cited journals

Table 46 shows the names of the most-cited journals before Vatican II. The criterion for inclusion on the list was that it be part of the nucleus in the earlier Bradford study for that period.

Table 46

Most-Cited Journals: Pre-Vatican II

Journal Title	No. of Citations	% of Citations
[a]Theological Studies	258	13.0
[b]Recherches de Science Religieuse	67	3.4
[d]Zeitschrift fur Katholische Theologie	62	3.1
[b]Nouvelle Revue Theologique	51	2.6
[b]Revue Thomiste	50	2.5
[b]Ephemerides Theologicae Lovanienses	48	2.4
[a]American Ecclesiastical Review	46	2.3
[a]Scientific American	40	2.0
[c]Gregorianum	37	1.9

[a]English-language journal. [b]French-language journal. [c]Multi-language journal. [d]German-language Journal

For the pre-Vatican II time period there were nine journals in the nucleus. The journals are listed in rank order and the percentage of citations column refers to the percentage of all cited journals.

Theological Studies was cited about four times as often as any other journal during the pre-Vatican II years. Citations to articles in that one journal comprised 13% of the total citations to journals.

Table 47 shows the most-cited journals after Vatican II. These journals are the 17 journals found in the Bradford nucleus for the period after Vatican II. The journals are listed in rank order and the percentage of citations column refers to the percentage of all cited journals.

Table 47

Most-Cited Journals: Post-Vatican II

Journal Titles	No. of Citations	% of Citations
[a]Theological Studies	440	12.8
[a]Origins	126	3.7
[a]America	61	1.8
[c]Gregorianum	52	1.5
[c]Antonianum	50	1.5
[a]The Tablet	44	1.3
[b]Annales de Philosophie Chretienne	44	1.3
[a]Louvain Studies	38	1.1
[a]Worship	38	1.1
[d]Zeitschrift fur Katholische Theologie	37	1.1
[a]Thomist	36	1.1
[a]Journal of Religion	32	0.9
[a]Catholic Biblical Quarterly	31	0.9
[a]Man	29	0.8
[a]Journal of Theological Studies	28	0.8
[d]Theologische Quartelschrift	28	0.8
[a]Theology Digest	28	0.8

[a]English-language journal. [b]French-language journal. [c]Multi-language journal. [d]German-language Journal

Theological Studies still retained the position it occupied before Vatican II at the top of the list but only three journals that were among the top 10 journals before Vatican II (see Table 46) appear on the list after Vatican II.

Table 48 shows the titles of the most-cited journals for the pre- and post-Vatican II years. The journals are listed in rank order and are the 17 journals that were found to be in the nucleus in the Bradford results for the pre- and post-Vatican II period analyzed as a whole.

Table 48

Most-Cited Journals: Pre- and Post-Vatican II

Journal Title	No. of Citations	% of Citations
[a]Theological Studies	698	15.8
[a]Origins	126	2.9
[d]Zeitschrift fur Katholische Theologie	99	2.2
[b]Recherches de Science Religieuse	90	2.0
[c]Gregorianum	89	2.0
[a]American Ecclesiastical Review	79	1.8
[a]America	78	1.8
[b]Nouvelle Revue Theologique	74	1.7
[a]Catholic Biblical Quarterly	61	1.4
[b]Ephemerides Theologicae Lovanienses	58	1.3
[a]Journal of Theological Studies	57	1.3
[b]Revue Thomiste	53	1.2
[c]Antonianum	51	1.2
[a]Journal of Biblical Literature	51	1.2
[a]The Tablet	51	1.2
[b]Annales de Philosophie Chretienne	48	1.1
[a]Worship	46	1.0

[a]English-language journal. [b]French-language journal. [c]Multi-language journal. [d]German-language Journal

Theological Studies retained its most-cited position when the pre- and post-Vatican II years were analyzed as a whole. Of the 17 most-cited journals, nine of them are in English and five are in French. Only one journal, Zeitschrift fur Katholische Theologie, is a German-language publication.

Language Distribution of the Cited Journals

An analysis was made of the languages in which the cited journals were published. Table 49 shows the results of this analysis for the period before Vatican II and the period after Vatican II.

Table 49

Language Distribution of the Cited Journals: Pre- and Post-Vatican II

	Pre-Vatican II				Post-Vatican II		
Language	No. of Citations	% of Citations	Cum. % of Citations	Language	No. of Citations	% of Citations	Cum. % of Citations
English	984	49.7	49.7	English	2,400	70.0	70.0
French	528	26.7	76.4	German	428	12.5	82.5
German	272	13.7	90.1	French	354	10.3	92.9
Multi	66	3.3	93.4	Multi	86	2.5	95.4
Spanish	37	1.9	95.3	Italian	29	0.8	96.2
Italian	30	1.5	96.8	Latin	22	0.6	96.8
Latin	21	1.1	97.9	Spanish	16	0.5	97.3
Dutch	3	0.2	98.0	Dutch	3	0.1	97.4
				Polish	1	0.0	97.4
				Portug	1	0.0	97.5
Unknown	39	2.0	100.0	Unknown	87	2.5	100.0
Total	1,980			Total	3,427		

Both before and after Vatican II, English was the predominant language of the cited journals, although before Vatican II slightly more than one-half of the citations were to non-English journals.

After Vatican II the use of English-language journals had risen considerably to 70%, and the usage of non-English journals had dropped to only 30%.

Table 50 shows the language distribution of the cited journals for the pre- and post-Vatican II years analyzed as a whole.

Table 50

Language Distribution of Cited Journals: Pre- and Post-Vatican II

Language	No. of Citations	% of Citations	Cumulative % of Citations
English	3,384	62.6	62.6
French	882	16.3	78.9
German	700	12.9	91.8
[a]Multi	152	2.8	94.7
Italian	59	1.1	95.7
Spanish	53	1.0	96.7
Latin	43	0.8	97.5
Dutch	6	0.1	97.6
Polish	1	0.0	97.7
Portuguese	1	0.0	97.7
Unknown	126	2.3	100.0
Total	5,407		

[a]Multi-language Journal

Journals published in only three languages, English, French, and German, accounted for over 90% of the citations.

Geographic Location of the Publisher of the Cited Journals

An analysis was made of the geographic location of the publishers of the cited journals. Table 51 shows the results of this analysis for the pre- and post-Vatican II periods analyzed as a whole.

Table 51

Geographic Location of the Publisher of Cited Journals

Country	No. of Journals	% of Journals	Cumulative %
USA	298	43.3	43.3
Germany	92	13.4	56.6
France	61	8.9	65.5
England	60	8.7	74.2
Italy	34	4.9	79.1
Belgium	29	4.2	83.3
Canada	18	2.6	85.9
Netherlands	15	2.2	88.1
Spain	12	1.7	89.8
Switzerland	10	1.5	91.3
Austria	7	1.0	92.3
Ireland	7	1.0	93.3
Norway	3	0.4	93.8
Israel	3	0.4	94.2
Brazil	3	0.4	94.6
Scotland	2	0.3	94.9
Columbia	2	0.3	95.2
India	2	0.3	95.5
Philippines	2	0.3	95.8
Costa Rica	1	0.1	95.9
Argentina	1	0.1	96.1
Poland	1	0.1	96.2
Greece	1	0.1	96.4
South Africa	1	0.1	96.5
Kenya	1	0.1	96.7
Australia	1	0.1	96.8
Egypt	1	0.1	97.0
Sweden	1	0.1	97.1

Mexico	1	0.1	97.2
Unknown	19	2.8	100.0
	689		

Table 51 shows that U.S. publishers were responsible for about 43% of the cited journals. Publishers located in only 10 countries provided over 90% of the journals.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

The purpose of this study was to profile the quantitative characteristics of the Catholic research literature before and after Vatican II, and then to compare the changes in light of certain recommendations from that event. Two major research questions were formulated: (a) Were the characteristics of the authors who published in Theological Studies during the period before and after Vatican II significantly different, and (b) were the characteristics of the citations used by these authors during the period before and after Vatican II significantly different?

The methodology selected for the study was an analysis of the articles in a leading theology journal. Data was gathered on the characteristics of the authors and the characteristics of the citations in two time periods, before and after Vatican II. The two time-periods were then compared for any differences in these characteristics. A test for Lotka's Law of author productivity and a test of Bradford's Law of title dispersion were also completed for this literature for the periods before and after Vatican II to determine if this literature conformed to the laws. The names of the core journal for theological research were identified, and the subject dispersion of this literature was analyzed and reported. An analysis was also made of the technical features of all of the volumes of the journal for the pre- and post-Vatican II years.

Conclusions

Conclusions about the results of the analysis will be presented in four sections, each addressing one of the main research questions:

1. Characteristics of the authors,

2. Productivity of the authors, including the test of Lotka's Law,

3. Subject dispersion of the literature, including the test of Bradford's Law of title dispersion, and

4. Characteristics of the citations

The conclusions about the results of the analysis are presented in the order in which the research questions were presented. A discussion of the conclusions follows the presentation of the four sections.

Characteristics of the Authors

The first research question for the study was: Were the characteristics of the authors who published in Theological Studies during the period before and after Vatican II significantly different?

Several, but not all of the characteristics of the authors were significantly different after Vatican II.

The types and names of the most productive institutions changed significantly after Vatican II. Before the council, six small Catholic seminaries provided most of the authors. After Vatican II the most-productive institutions were a combination of the large Catholic universities and two smaller seminaries. During the 1970s, six seminaries were closed due to falling enrollment. With the closing of the seminaries, Catholic faculty, scholars, and students evidently migrated to the scholarly communities of the larger institutions. The closing of the seminaries caused the change in this characteristic.

There was no significant change in the location of the institutions in which the authors were located after Vatican II. The most productive location for the institutions in both periods was the U.S. The most-productive states also remained approximately the same in both time periods with the exception of one state which dropped off the list of leading states after Vatican II. This characteristic remained the same because most scholars simply moved to colleges and universities nearby when the seminaries closed.

The number of authors who were laypersons changed significantly after Vatican II. As the number of priests and members of religious orders declined after Vatican II, their places were slowly taken by laypersons. The decline in the number of clergy and members of religious orders rather than the recommendations of Vatican II probably caused the change in this characteristic.

The gender of the authors after Vatican II was significantly different. All of the articles published before Vatican II were written by men. After Vatican II about one in ten of the authors were women. The presence of women as authors was probably the result of the social upheavals of the 1960s and 1970s in which women began to assume roles formerly reserved to men. Their inclusion as authors in the journal was probably more a result of these social and demographic changes rather than the recommendations of Vatican II.

The occupational status of the authors was not significantly different after Vatican II. The proportion of academics and non-academics remained approximately the same as it had been before Vatican II.

Author Productivity

Several of the research questions addressed the productivity of the authors: (a) whether this literature adhered to Lotka's Law, (b) who were the most productive authors, and (c) were there any changes in their productivity after Vatican II?

The literature in this study adhered to Lotka's Law in the pre-Vatican II years but was not a good fit to it in the post-Vatican II years or for the pre- and post-Vatican II years when analyzed as a whole.

The Lotka results show that the authors in the post-Vatican II period were less productive than those in the pre-Vatican II years. In all periods more than 60% of all authors wrote only one paper, which fits the verbal formulation of Lotka's Law. However, the number of authors writing more than one article declined from 20% before Vatican II to 15% after Vatican II.

There could be several reasons for the decline in the number of authors writing more than one article after Vatican II. First, the number of authors available to produce the articles increased as the journal changed its focus from the work produced by the faculty at seminaries to publications from "all theologians" (Burghardt, 1989). As the population of potential authors increased, the space available to publish their work decreased. The journal editors simply could be more selective. The change in focus on the work of a "selected few" to the new population at may have caused the decline in the productivity ratings for those selected few.

Second, the first editor of the journal in its pre-Vatican II years also published eight articles, the most of any author in the pre-Vatican II years. The need for articles in the early years of the journal may have caused this prolific production by necessity, but a case can be made that his work would have been published had any other editor been in the post.

Third, many articles in all journals of theology and religion are distillations of an author's dissertation and the author may have no intention of pursuing publication again or may not continue active research. He or she may work in a small college or seminary where teaching is valued more than publication.

A knowledge of world, U.S., and Catholic events at the time suggest that the changes that did occur in the characteristics of the authors after Vatican II were probably due more to a series of social and demographic changes within the Catholic religious and theological community rather than to the recommendations of Vatican II.

Characteristics of the Citations

The second major research questions for the study was: Did the characteristics of the citations change after Vatican II?

Subject Dispersion of the Literature

One of the questions addressed the issue of the extent of subject dispersion in this literature. The research showed that subject dispersion in both periods was low. Authors cited works whose subject matter was largely composed of research published in their own theology field. The low subject dispersion of the citations in both periods may be indicative of the subject matter itself. Few disciplines approach moral questions with such vigor as theologians; the research available to them elsewhere on such questions is limited.

The use of the research from the literature of psychology, science, social sciences, and education increased significantly after Vatican II. Because the recommendations of Vatican II had been for theologians to use more of the findings of those disciplines in their own research, we can conclude that the recommendations of Vatican II had an effect on Catholic theological research in this instance.

The last research question addressed the characteristics of the citations used by the authors in the period before and after Vatican II and posed the question: Were the characteristics of the citations used by these authors during the period before and after Vatican II significantly different?

There was no significant change in the age of the cited documents after Vatican II. The large number of current works cited shows that theologians are not bound to the past when choosing sources for their research. Contrary to most anecdotal surveys, it would not be necessary for small libraries to spend an inordinate amount of money or reserve shelf space for older works. The articles needed from journals for instance, could be acquired from on-line databases. Had patristic and medieval works been included in the study, older works might have formed a higher percentage of the cited documents.

There was no significant change in the most-cited format after Vatican II. The most-cited format in both time periods was the monograph. This usage is in line with the format preferences of the other humanities.

There was also no significant change in the languages used after Vatican II. The predominant languages used in the cited works remained about the same in both time periods: English, French, and German. Nearly all significant work in theology will appear in one of these languages either in its original form or as translations. One can conclude that theologians prefer the translation to the original work, and had publications in Latin, Spanish, or Dutch been translated into one of the three major languages, the translation rather than the original would have been cited, thus increasing the count for the major languages.

There was no significant change in the geographic location of the publishers after Vatican II. The predominant place of publication of the cited works in both periods was the United States. The geographic location analysis reflected the results of the language analysis.

The names of the most-cited journals before Vatican II changed significantly after Vatican II. Of those journals that were the most-cited before Vatican II, only three of them appear on the list of the most-cited journals after Vatican II. One reason for the change in the names of the journals is the growing number of journals in all fields, including theology and religion, thus making the choice of journals for research much more selective.

The basic research objective of this study was to determine whether certain recommendations promulgated by the documents of Vatican II are reflected by changing publication characteristics in the Catholic literature. Only one question of the study, that of the increase in the subject dispersion of the literature after Vatican II can be tied to the Vatican II recommendations.

Other Findings

The geographic location of the publishers of the cited works was also analyzed, using the information gathered from the citation data. Questions that were addressed were: (a) what were the most productive geographic locations of publishers for the cited documents, (b) what were the most productive geographic locations of publishers before Vatican II, and (c) what were the most productive geographic locations of publishers after Vatican II?

Geographic Locations of the Cited Works

The geographic location of the publisher of the cited works was also analyzed for (a) the most productive geographic locations of publishers for the cited documents, (b) the most productive geographic locations of publishers before Vatican II, and (c) the most productive geographic locations of publishers after Vatican II.

Since only the city of publication was given in the citation, each city was linked to its country for this portion of the analysis. A column for "rank" was also added to the table.

Table 52 shows the results of the analysis on the country of publication.

Table 52

Geographic Location of Cited Works: Pre- and Post-Vatican II

	Pre-Vatican II					Post-Vatican II			
Country	No. of Citations	% of Citations	Cum % of Citations	Rank	Country	No. of Citations	% of Citations	Cum % of Citations	Rank
USA	1,997	23.5	23.5	1	USA	9,796	56.6	56.6	1
France	1,566	18.4	41.9	2	Germ'y	2,093	12.1	68.7	2
Germ'y	1,310	15.4	57.3	3	England	1,524	8.8	77.5	3
England	1,146	13.5	70.7	4	France	1,314	7.6	85.1	4
Italy	778	9.1	79.9	5	Italy	528	3.1	88.2	5
Belgium	477	5.6	85.5	6	Switz'ld	514	3.0	91.2	6
Austria	229	2.7	88.2	7	Belgium	359	2.1	93.2	7
Switz'ld	96	1.1	89.3	8	Nethl'ds	196	1.1	94.4	8
Nethl'ds	81	1.0	90.3	9	Canada	190	1.1	95.5	9
Scotland	44	0.5	90.8	10	Austria	122	0.7	96.2	10

Other	784	9.2	100.0	Other	664	3.8	100.0
Total	8,508	100.0		Total	17,300	100.0	

Works from the U.S. led as the predominant place of publication both before and after Vatican II. In the pre-Vatican II years the United States was cited as place of publication in only 23.5% of the citations while after Vatican II it was cited in 56.6% of them. Works from France fell in usage from 18.4% of the cited works to only 7.6%, a decrease which caused France to relinquish its former second-place standing to Germany. Although the percentage of citations to Italian publications dropped by more than half after Vatican II, Italian publications remained in fifth place for both time-periods.

Table 53 shows the results of the analysis of the country of publication for the pre- and post-Vatican II years analyzed as a whole.

Table 53

<u>Geographic Location of the Cited Works: Pre- and Post-Vatican II</u>

Country	No. of Citations	% of Citations	Cum % of Citations	Rank
USA	11,793	45.7	45.7	1
Germany	3,403	13.2	58.9	2
France	2,880	11.2	70.0	3
England	2,670	10.3	80.4	4
Italy	1,306	5.1	85.4	5
Belgium	836	3.2	88.7	6
Switzerland	610	2.4	91.0	7
Austria	351	1.4	92.4	8
Netherlands	277	1.1	93.5	9
Canada	208	0.8	94.3	10
Other	1,474	5.7	100.0	
Total	25, 808			

Publications from the U.S., Germany, France, and England accounted for over 80% of the cited works for the pre- and post-Vatican II years. Materials published in Italy comprised about 5% of the cited works. Less than 15% of the publications came from countries other than these top five.

U.S. Distribution of the Cited Works by State

If the country of origin was the United States, an additional analysis was added to learn which states provided the most publishers. Table 54 shows the results of this analysis for the period before Vatican II and the period after Vatican II.

Table 54

U.S. Publishers' Locations by State: Pre- and Post-Vatican II

	Pre-Vatican II					Post-Vatican II			
State	No. of Citations	% of Citations	Cum % of Citations	Rank	State	No. of Citations	% of Citations	Cum % of Citations	Rank
NY	701	35.1	35.1	1	NY	4,680	47.8	47.8	1
MD	396	19.8	54.9	2	MD	795	8.1	55.9	2
DC	182	9.1	64.0	3	DC	663	6.8	62.7	3
IL	151	7.6	71.6	4	PA	627	6.4	69.1	4
MO	100	5.0	76.6	5	IL	559	5.7	74.8	5
PA	99	5.0	81.6	6	IN	417	4.3	79.0	6
MA	97	4.9	86.4	7	MA	392	4.0	83.0	7
WI	65	3.3	89.7	8	CA	273	2.8	85.8	8
OH	30	1.5	91.2	9	NJ	213	2.2	88.0	9
IN	26	1.3	92.5	10	CT	190	1.9	89.9	10
TN	25	1.3	93.7	11	MO	175	1.8	91.7	11
MN	21	1.1	94.8	12	MN	147	1.5	93.2	12
NJ	17	0.9	95.6	13	MI	133	1.4	94.6	13
VA	13	0.7	96.3	14	VA	81	0.8	95.4	14
CT	12	0.6	96.9	15	WI	77	0.8	96.2	15

Other	49	2.5	99.3	Other	371	3.8	100.0
Unknown	13	0.7	100.0	Unknown	3	0.0	
Total	1,997			Total	9,796	100.0	

New York was by far the most prolific state for publication of the cited works in both periods. Before Vatican II, 64% of the cited works could be found from the output of just three states: New York, Maryland, and Washington, D.C. Each of these states retained their rankings after Vatican II.

After Vatican II the number of publishers who were based in New York rose significantly from the publication of slightly over one-third of the works in the pre-Vatican II period to the publication of nearly one-half of them in the post-Vatican II period. The first three states in the rankings---New York, Maryland, and the District of Columbia---furnished over two-thirds of the publications in both periods.

Table 55 shows the results of the analysis on the rankings of the states for the pre- and post-Vatican II years analyzed as a whole.

Table 55

U.S. Publishers' Locations by State: Pre- and Post-Vatican II

State	No. of Citations	% of Citations	Cum % of Citations	Rank
NY	5,381	45.6	45.6	1
MD	1,191	10.1	55.7	2
DC	845	7.2	62.9	3
PA	726	6.2	69.0	4
IL	710	6.0	75.1	5
MA	489	4.1	79.2	6
IN	443	3.8	83.0	7
CA	281	2.4	85.4	8
MO	275	2.3	87.7	9

NJ	230	2.0	89.6	10
CT	202	1.7	91.4	11
MN	168	1.4	92.8	12
MI	145	1.2	94.0	13
WI	142	1.2	95.2	14
VA	94	0.8	96.0	15
Other	455	3.9	99.9	
Unknown	16	0.1	100.0	
Total	11,793	100.0		

For the pre- and post-Vatican II years of the study, publishers located in only five states provided over 75% of the cited works. Over half of the cited works were published in only two states--New York and Maryland.

Editorial and Technical Features of *Theological Studies*

The journal began publication by focusing almost entirely on original theological research published as articles. The subsequent focus of the journal over the years has been sporadic: fewer and shorter articles are the norm. The journal is now about half original research and half other material. It has maintained approximately the same number of pages in all the issues since it began publication. One feature of the journal, "Notes on Moral Theology" was introduced later and consumes many pages of the journal several times a year. The number of pages available for original articles may have declined as a result.

Personal Characteristics of the Most-Productive Authors

After the Lotka analysis was completed for the most-productive authors, an analysis was made of their personal histories. The authors who furnished three or more articles were considered to be the most-productive authors.

Before Vatican II there were 12 authors in this group. All were men, and 11 of them were members of the Jesuit order. They were all academics and all but one were affiliated with a seminary in the U.S. Nine of them had been born between the years 1894 and 1920. Ten had achieved a doctoral degree in their profession. Four graduated from the Gregorian University in Rome, two graduated from U.S. Jesuit seminaries, one graduated from the University of Munich, and one graduated from Johns Hopkins. Six authors received their degrees in the 1930s and 1940s when they were between 32 and 38 years of age.

There were eight authors on the list of the most-productive in the post-Vatican II group. All of these authors were men and six were members of the Jesuit order. Seven of them were academics and three were affiliated with U.S. seminaries. One was from Australia. All had achieved doctoral degrees from varying European and U.S. institutions. One interesting fact about the degree-granting institution is that all of the authors graduated from different institutions.

There were 17 authors who appeared on the most-productive list for the pre- and post-Vatican II years analyzed as a whole. All were men, and 13 were members of the Jesuit order. Ten were affiliated with U.S. seminaries, and there was one author each from seminaries in Canada, Australia, and India.

All of the authors on the list had achieved doctoral degrees. Four graduated from the Gregorian Institute in Rome, two graduated from different universities in Germany, and one received his doctorate from a seminary in Australia. Of those who graduated from U.S. institutions, two received doctorates from Johns Hopkins and there was one author who graduated from Harvard and one from the Catholic University of America.

Comparison Between the Most-Productive Authors and the Most-Cited Authors

An analysis was made of the most-productive author list vis a vis the most-cited author list to see if the most-productive authors were also the most-cited authors. The analysis included all of the citations to the author from all sources.

In the pre-Vatican II years, only one author who appeared on the list of most-productive also appeared on the list of the most-cited--Bernard Lonergan. He wrote three articles in Theological Studies and his works were cited 176 times.

In the period after Vatican II, and also for both the pre- and the post-Vatican II periods analyzed as a whole, no author who appeared on the most-productive list also appeared on the most-cited list.

The sharp "spike" in the use of works from 1858-1924 both after Vatican II and for the pre- and post-Vatican II period was checked to see why these works would have received so much attention. The works were by Jacques Bossuet, (1864 and 1874), Thomas Hughes, (1907), P. Bedjan (1907), A. Loisy (1912), and G. W. Leibniz (1882).

Discussion

If one were searching for the master theologians and the centers of research before Vatican II, both would have been located at one of the Jesuit seminaries in the U.S. After Vatican II they would both be found at either of two major seminaries or two large universities, but still located in the U.S.

The large increase in laypersons involved in theological research after Vatican II was unexpected; authors who came from hospitals, law schools and medical schools shows that some issues of interest to theologians can best be discussed by professionals from other fields.

In the analysis of the technical features of the journal, one finding was surprising: throughout most of its years of publication, less than 50% of the pages in Theological Studies were devoted to original research. The journal was actually functioning more as a review journal than a research journal.

The large proportion of citations in the German language was expected considering the leadership role played German theologians in the Catholic Church. One of the problems in analyzing the use of the German language before Vatican II was the dismal situation that occurred during the World War II for Catholic publishing houses. When Germany became a secularized state, many of these publishers fled to France, Belgium, or Switzerland; many of their works were published in France and in the French language. After the war however, German regained its expected status.

Quantitative studies such as the present one have more meaning when verified by experts working within the profession. In 1998, the editor of Theological Studies published a list of journals which he considered to be the "best" theological journals internationally. In his estimation, these journals published "far-reaching articles pertinent for the renewal of theology, church, and society"(Fahey, 1998, p. 383). In constructing his list, he excluded Theological Studies and biblical journals. If the list of leading journals in this study is limited in the same way, among his top 20 journals, nine of them appear on the 20 most-productive journal list in this study. Fahey also named the authors which he felt should be singled out for special commendation for this century. Out of his list of 20 authors, eight of them appear on the list of leading authors in the present study.

Suggestions for Further Research

Future researchers might use bibliometric analysis to study the two other journals which publish Catholic historical or biblical research. A combination of all of these studies would give a complete picture of the underlying knowledge structure of Catholic theology and would be of value to theologians, students, and librarians.

Studies on the most-cited publishers would be of value to librarians responsible the collecting theological works. Foreign-language publishers have a decided presence in the research community, especially those publishing French and German journals.

Religious and theological authors are taking advantage of the newer "e-journal" formats on the internet as a channel for their research. Studies could be conducted on the research presented there and compared to the present one.

Although it is beyond the scope of this study to review the present state of the church, its results might shed some light on the possibility that Catholic theology is undergoing a paradigm shift. Sanks (1974) wrote that the two paradigms involve one that consists of ideas and methods engendered by theologians and bishops trained in the pre-Vatican II era and the other that consists of the ideas and methods of those trained in the post-Vatican II era. A more complete analysis of the work of each of those authors and their citation histories could add to the knowledge of such a change in paradigms. Since the computerized data in these types of studies easily links an author with his or her citations, the authors, dates, and formats preferred by each author could be analyzed. The results of this type of research could further discussions of such new paradigms.

APPENDIX A

RECOMMENDATIONS OF THE SECOND VATICAN COUNCIL

RECOMMENDATIONS OF THE SECOND VATICAN COUNCIL

The recommendations selected for this study were published in The Church in the Modern World in 1965. It is now more popularly known as Gaudium et Spes, promulgated Dec. 7, 1965.

Although the Church has contributed much to the development of culture, experience shows that, for circumstantial reasons, it is sometimes difficult to harmonize culture with Christian teaching. These difficulties do not necessarily harm the life of faith, rather they can stimulate the mind to a deeper and more accurate understanding of the faith. The recent studies and findings of science, history and philosophy raise new questions which effect life and which demand new theological investigations.

In pastoral care, sufficient use must be made not only of theological principles, but also of the findings of the secular sciences, especially of psychology and sociology, so that the faithful may be brought to a more adequate and mature life of faith. Literature and the arts are also, in their own way, of great importance to the life of the Church.

May the faithful, therefore, live in very close union with the other men of their time and may they strive to understand perfectly their way of thinking and judging, as expressed in their culture. Let them blend new sciences and theories and the understanding of the most recent discoveries with Christian morality and the teaching of Christian doctrine, so that their religious culture and morality may keep pace with scientific knowledge and with the constantly progressing technology. Thus they will be able to interpret and evaluate all things in a truly Christian spirit.

Let those who teach theology in seminaries and universities strive to collaborate with men versed in the other sciences through a sharing of their resources and points of view. Theological inquiry should pursue a profound understanding of revealed truth; at the same time it should not neglect close contact with its own time that it may be able to help these men skilled in various disciplines to attain to a better understanding of the faith. This common effort will greatly aid the formation of priests, who will be able to present to our contemporaries the doctrine of the Church concerning God, man and the world, in a manner more adapted to them so that they may receive it more willingly.

Furthermore, it is to be hoped that many of the laity will receive a sufficient formation in the sacred sciences and that some will dedicate themselves professionally to these studies, developing and deepening them by their own labors. In order that they may fulfill their function, let it be recognized that all the faithful, whether clerics or laity, possess a lawful freedom of inquiry, freedom of thought and of expressing their mind with humility and fortitude in those matters on which they enjoy competence.

Let those who teach theology in seminaries and universities strive to collaborate with men versed in the other sciences through a sharing of their resources and points of view. Theological inquiry should pursue a profound understanding of revealed truth; at the same time it should not neglect close contact with its own time that it may be able to help these men skilled in various disciplines to attain to a better understanding of the faith.

Furthermore, it is to be hoped that many of the laity will receive a sufficient formation in the sacred sciences and that some will dedicate themselves professionally to these studies, developing and deepening them by their own labors.

Women now work in almost all spheres. It is fitting that they are able to assume their proper role in accordance with their own nature. It will belong to all to acknowledge and favor the proper and necessary participation of women in the cultural life.

(St. Ignatius Website: http://www.st-ignatius.org/vatican2/)

APPENDIX B

FORMULA AND COMPUTATIONS FOR LOTKA'S LAW

FORMULA AND COMPUTATIONS FOR LOTKA'S LAW

The application of Lotka's Law provides data about the productivity of the authors in a defined source. The steps for applying Lotka's Law to a literature are:

1. The names of all of the authors who produced the articles are collected

2. The number of articles which they produced are counted

3. A table is then constructed showing the number of authors producing 1 article each, the number producing 2 articles each, etc.

4. These numbers are then translated to percentages for the entire data-set and then again to decimal form. This calculation gives the proportion of authors in the data set.

5. The data is then applied to the Lotka equation:

$x^n y = c$ (constant)

1) where y = the proportion of authors making x contributions each;

2) n and c are parameters that depend on the field being analyzed

<u>Author Productivity: Pre-Vatican II</u>

No. Articles per Author	Observed No. of Authors	Proportion of Authors	Cumulative Proportion of Authors	Predicted Proportion of Authors	Predicted Cumulative Proportion	Predicted-Observed Deviation
x		${}^{a}y$	${}^{b}S_n(x)$	${}^{c}y'$	${}^{d}F_o(x)$	${}^{e}D_{max}$
1	67	67.68	0.6768	69.27	0.6927	0.01590
2	20	20.20	0.8788	15.89	0.8516	0.02718
3	6	6.06	0.9394	6.72	0.9188	0.02060
4	3	3.03	0.9697	3.65	0.9553	0.01444
5	2	2.02	0.9899	2.27	0.9780	0.01193
6	0	0.00	0.9899	1.54	0.9934	0.00348
7	0	0.00	0.9899	1.11	1.0045	0.01459
8	1	1.01	1.0000	0.84	1.0129	0.01286
	99					

<u>Note.</u> Lotka Formula: $c=yx^n$
${}^{a}y$ = no. of authors publishing x articles,
${}^{c}y'$ = The predicted y value using the regression formula.
(c and n are parameters to be determined by regression analysis)

<u>Linear "Least Squares" Regression Analysis Statistics</u>:
Results: c= 69.2669
n= -2.1237
R^2= 0.9875

Regression formula and statistics were determined using the LINEST function of Microsoft Excel 97.
where: R^2 = The coefficient of determination. (Measures how well the formula explains the actual values. A value of 1 means a perfect correlation; a value of 0 indicates the regression formula is not helpful in predicting a y-value.)

${}^{b}S_N(x)$=Cumulative proportion of observed source authors.

${}^{d}F_o(x)$=Cumulative proportion of predicted source authors.

${}^{e}D_{max}$=The maximum deviation between the predicted and observed proportion of authors as given by: $D_{max}= | S_N(x) - F_o(x) |_{max}$

<u>Kolmogorov-Smirnov (K-S) test results were as follows:</u>

D_{max}=0.02718

N=99, (N= the number of observations)

Sig.Lvl$_{.01}$=0.165501, (Significance Level$_{.01}$=1.63/SQRT(N))

D_{max} is less than Sig. Lvl$_{.01}$, so data does adhere to Lotka Law

Author Productivity: Post-Vatican II

No. Articles per Author x	Observed No. of Authors	Proportion of Authors $^a y$	Cumulative Proportion of Authors $^b S_n(x)$	Predicted Proportion of Authors $^c y'$	Predicted Cumulative Proportion $^d F_o(x)$	Predicted-Observed Deviation $^e D_{max}$
1	147	80.33	0.8033	94.18	0.9418	0.138501
2	28	15.30	0.9563	11.08	1.0526	0.096278
3	6	3.28	0.9891	3.17	1.0842	0.095169
4	2	1.09	1.0000	1.30	1.0973	0.097271
	183					

Note.

Lotka Formula: $c=yx^n$

^{a} y = No. of authors publishing x articles,
(*c* and *n* are parameters to be determined by regression analysis)

$^c y'$ = The predicted y value using the regression formula.

Linear "Least Squares" Regression Analysis Statistics:

Results: c= 94.1780
n= -3.08767
R^2= 0.9878

where: R^2 = The coefficient of determination. Measures how well the formula explains the actual values. A value of 1 means a perfect correlation; a value of 0 indicates the regression formula is not helpful in predicting a y-value.
Regression formula and statistics were determined using the LINEST function of Microsoft Excel 97.

$^b S_N(x)$=Cumulative proportion of observed source authors.

$^d F_o(x)$=Cumulative proportion of predicted source authors.

$^e D_{max}$= The maximum deviation between the predicted and observed proportion of authors as given by: D_{max}=, $| S_N(x) - F_o(x) |_{max}$

Kolmogorov-Smirnov (K-S) test results were as follows:

D_{max}=0.138501

N=183, (N= the number of observations)

Sig.$Lvl_{.01}$=0.120493, (Significance $Level_{.01}$=1.63/SQRT(N))

D_{max} is greater than Sig. $Lvl_{.01}$, so data does not adhere to Lotka Law

Author Productivity: Pre- and Post-Vatican II

No. Articles per Author x	Observed No. of Authors	Proportion of Authors [a]y	Cumulative Proportion of Authors [b]$S_n(x)$	Predicted Proportion of Authors [c]y'	Predicted Cumulative Proportion [d]$F_o(x)$	Predicted-Observed Deviation [e]D_{max}
1	201	74.17	0.7417	78.17	0.7817	0.04000
2	48	17.71	0.9188	12.83	0.7909	0.12793
3	13	4.80	0.9668	4.46	0.8006	0.16623
4	4	1.48	0.9815	2.10	0.8104	0.17118
5	2	0.74	0.9889	1.18	0.8203	0.16867
6	0	0.00	0.9889	0.73	0.8302	0.15878
7	2	0.74	0.9963	0.49	0.8401	0.15620
8	1	0.37	1.0000	0.35	0.8501	0.14989
	271					

Note.

Lotka Formula: $c=yx^n$

[a]y = No. of authors publishing x articles,
(*c* and *n* are parameters to be determined by regression analysis)

[c]y' = The predicted y value using the regression formula.

*Linear "Least Squares" Regression Analysis Statistics:

Results: c= 78.17
n= -2.6075
R^2= 0.972

where: R^2 = The coefficient of determination. (Measures how well the formula explains the actual values. A value of 1 means a perfect correlation; a value of 0 indicates the regression formula is not helpful in predicting a *y*-value.)
*Regression formula and statistics were determined using the LINEST function of Microsoft Excel 97.
[a]$S_N(x)$=Cumulative proportion of observed source authors.

[b]$F_o(x)$=Cumulative proportion of predicted source authors.

[c]D_{max}= The maximum deviation between the predicted and observed proportion of authors as given by: D_{max}=, $| S_N(x) - F_o(x) |_{max}$

Kolmogorov-Smirnov (K-S) test results were as follows:

D_{max}=0.17118

N=271, (N= the number of observations)

Sig.Lvl$_{.01}$=0.099015, (Significance Level $_{.01}$=1.63/SQRT(N))

D_{max} is greater than Sig. Lvl$_{.01}$, so data does not adhere to Lotka Law

APPENDIX C

FORMULA AND CALCULATIONS FOR BRADFORD'S LAW OF TITLE DISPERSION

FORMULA AND CALCULATIONS FOR BRADFORD'S LAW

Steps taken in this study to apply Bradford's Law:

1. A population of articles was identified as those from the journal Theological Studies.

2. Citations from the articles referring to journals were collected.

3. The number of citations to each journal were counted and the journals were ranked so that the journal which contributed the most citations was ranked #1, the journal with the next greatest number of articles was ranked #2, and so forth.

4. A 5-column table was constructed so that each line represents the rank of the journal title. In column 1 was the rank of the journal. In column 2 were the number of citations contributed by the journals. In column 3 were the cumulative number of titles. In column 4 were the cumulative number of citations, and in column 5 was the cumulative percentage of citations.

5. While retaining the order of the journals, the list was divided into three groups each containing about the same number of citations. The groups were then identified as: a) the "nucleus", b) Zone 2, and c) Zone 3.

The Bradford formula was applied to determine if this literature adhered to Bradford's Law of title dispersion. The literature from all three periods in the study: (a) Pre-Vatican II, (b) post-Vatican II, and (c) for the pre- and post-Vatican II years were tested.

Bradford stated that the number of journals in the zones should be in the proportion:

$1:n:n^2....$

1= Nucleus

n= Zone 2

n^2=Zone 3

When calculating for the title dispersion of the observed and predicted series, a "Bradford multiplier" was included in the calculations. The multiplier was designated as (n).

<u>1. Observed Series</u>

(a) The multiplier for Zone 2 was determined by dividing the number of journals in the nucleus into the observed number of journals in Zone 2.

(b) The multiplier for Zone 3 was determined by dividing the number of journals in the nucleus into the observed number of journals in Zone 3 and taking the square root of the result.

(c) The result is the ratio of the observed number of journals in each zone.

<u>2. Predicted Series</u>

(a) The Bradford multiplier (n) from 1(a) above was used to calculate the values for the predicted series.

(b) If the predicted series was generally the same as the observed series, the literature was considered to adhere to Bradford's Law.

APPENDIX D

ENTRY FIELDS AND FORM FOR AUTHOR DATA

ENTRY FIELDS AND FORM FOR AUTHOR DATA

1-3. Internal code numbers representing the volume, issue, article, and footnote number
4. Principal Author's Name
5. Gender
6. Status of the author: lay person or clergy
7. Occupation of the author: academic or non-academic
8. Institutional Affiliation
9. Geographic location of author or, if an academic, his or her institution
10. Language of the article*
11-12. Number of Pages in the article*
13. Number of References the author used*
14-16.Names of co-authors. These names will be recorded for up to 3 co-authors*
17. Author's religious affiliation
* Not used in final analysis

AUTHORS

1.______2.________3________4____
Iss Art# Author 1
5.__________ 6______________ 7____________8.______________________________
*Gender Lay? (Y or N) Occ (A or N) Institution
9_______________________________________10__________ 11__________
Geog location **Lang Beg Page
12.____________13._________________
End Page No of Refs
14 ____
Author 2
15.____
Author 3
16.____
Author 4

IF DOCUMENTED:
17.______________________________
Author 's Religion Affiliation
Collector's Notes
*Gender= M, F, or 99 (unknown) ** ONLY if NON-Eng

APPENDIX E

ENTRY FIELDS AND FORMS FOR CITATION DATA

ENTRY FIELDS AND FORMS FOR CITATION DATA

The following fields were used while collecting the characteristics of each citation. The fields that are used depend on the type of citation. All fields were coded later for data entry.

1-4. Internal code numbers for each citation. If the code number for the fields 1, 2, and 3 are the same as that used <u>on the previous form</u>, the line "DUPLICATE" is merely checked.
5. Format
6. Name of Principal Author
7. Name of Editor if a collection and is present in the citation itself
8. Place of Publication
9. Internal use only
10. Publication year
11. Journal title
12. Language of Cited Source
13. Notation if author self-citation
14. Notation if journal self citation
15-17. Names of co-authors, up to 3 only
18. Library of Congress Subject Classification of cited <u>journal</u> only.

<u>CITATION FORM 1</u>

1._____ 2._____ 3._____ 4.________ 5.____________
Vol Iss Art Footnote# Format* (see below)

6.______________________________
Author 1

7.______________________________
Editor

8.______________________________
Place of Publication

9.______________________________
[INTERNAL USE ONLY]

10.__________ 11.____________________
Pub Year Journal Title

12.__________ 13. __________ 14.__________
Lang Author Self-cite? Journal Self-cite?

15.______________________________
Author 2

16. ______________________________
Author 3

17.______________________________
Author 4

18. ______________ [WILL BE PROVIDED LATER]
LC Class

<u>1</u>= Monographs <u>2</u>= Journals, Periodicals, <u>3</u>=Ref works, Serials
<u>4=</u>Dissertations, Theses <u>5</u> <u>=</u>Annual Reports, 6=Seminars, Conf papers
7= *Festschriften* 8. Commentaries 9. Other. 99= Unknown

CITATION FORM 2: (REVISED FORMAT1)

Field 1. (Vol#)____________Field 2. (Issue#)_______________Field 3. (Article#)_______________

DUP EACH OF THE 3 FIELDS ABOVE FOR ALL THE RECORDS IN THIS GROUP.

THE CIRCLED WORD "IBID"MEANS TO DUP THE ENTIRE RECORD THAT IMMEDIATELY PRECEDED IT.

IF THE WORD "IBID" IS HANDWRITTEN IN A FIELD IT MEANS TO DUP THE SAME VALUE IN THAT FIELD AS THE SAME FIELD IN THE PREVIOUS RECORD.

---

4. FN#____________ (No Ibid) **5.** Format____________

6.Author____**7**.

Editor_________________________________

8. Place_______________________________**10**. Year________________________**11**

Journal_____________________________

12. Lang_________________ **13**. Auth Self Cite? ____________**14**. Jour Self Cite?________________

15. Author **2**______________________________________**16**.

Author**3**____

17. Author **4**______________________________________**18**. LC Class (Jour)_________________________

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4. FN#____________ **IBID** **5.** Format____________

6.Author____**7**.

Editor_________________________________

8. Place_______________________________**10**. Year________________________**11**

Journal_____________________________

12. Lang_________________ **13**. Auth Self Cite? ____________**14**. Jour Self Cite?________________

15. Author **2**______________________________________**16**.

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4. FN#____________ **IBID** **5.** Format____________

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8. Place_______________________________**10**. Year________________________**11**

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12. Lang_________________ **13**. Auth Self Cite? ____________**14**. Jour Self Cite?________________

15. Author **2**______________________________________**16**.

Author**3**____

17. Author **4**______________________________________**18**. LC Class (Jour)_________________________

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1. Monograph or Book 2. Journal 3. Serial, Ref work, Dict'y, 4. Dissertation 5. Annual Report 6. Seminar Paper
7. Conference Paper 8. Festschriften 9. Commentary on the Bible (Stated) 10. Other
99=Unknown

1. During the data collection the original form was revised to allow for faster collecting of the data

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