

GEOGRAPHICAL STUDIES OF BRAZIL IN THE UNITED STATES AND CANADA FROM 1945 UNTIL 2000*

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Abstract

The majority of mid-20th century geographical studies of Brazil by North Americans was regional-descriptive, but research conducted in recent decades has been more topic-oriented. Most of the studies have dealt with environmental and settlement issues associated with increasing population densities in the Amazon region. Agricultural and land-use practices in northeast and southern interior frontier areas have also attracted attention. Surprisingly few studies reported in the North American geographical literature have dealt with economic issues or the application of contemporary analysis tools such as GIS. The population centers of the southeast also appear to have been neglected. Reasons for these evident trends may be: North American geographers are publishing in journals from fields outside of geography; Brazilian scholars are providing adequate coverage of the topics neglected by North Americans; and the personal interests and experiences determine the type of research conducted by North American geographers.

Key words: Brazil, geographical research, regional studies, social sciences, paradigm, settlement.

Resumo

Estudos geográficos sobre o Brasil nos Estados Unidos e Canadá de 1945 até 2000

A maioria dos estudos geográficos sobre o Brasil, conduzidos por norte-americanos na metade do século 20, foram de natureza regional-descritiva, mas as pesquisas mais recentes têm sido orientadas a temas específicos. A maioria dos estudos têm abrangido temas ambientais e o povoamento da região amazônica. Práticas agrícolas e o uso da terra no nordeste e nas fronteiras interiores do sul e sudeste também têm atraído atenção. Relativamente poucos estudos apresentados na literatura geográfica norte-americana têm focalizado temas econômicos ou a aplicação de métodos analíticos modernos como o SIG. Os centros urbanos do sudeste também têm atraído pouca atenção. Razões para estas tendências evidentes podem possivelmente incluir: geógrafos norte-americanos frequentemente publicam em revistas fora do campo geográfico; pesquisadores brasileiros estão providenciando cobertura adequada dos temas ignorados por norte-americanos; e os interesses e a experiência pessoal determinam o tipo de estudos conduzidos por norte-americanos.

Palavras chaves: Brasil, pesquisa geográfica, estudos regionais, ciências sociais, paradigma, povoamento.

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INTRODUCTION

A large number of Brazil-focused geographical studies have been produced by Anglo-American scholars since 1945². While these studies have contributed significantly to our knowledge about Brazil, describing this body of scholarship presents several unique challenges. Some are linked directly to the discipline itself; such as the broad differences in definition of the scope of the field held by those who call themselves geographers; or the dramatic, and some would say convulsive, paradigm shifts that have taken place as geography (and sub-fields) has (have) evolved during the second half of the 20th century.

Other considerations relate to the position of Geography within the broader galaxy of the social and physical sciences. Because of the internal diversity of the field, geographers sometimes find themselves more closely associated with colleagues in other disciplines than with fellow geographers. They often publish in non-geographical journals and teach in non-geographical university departments. Many geographers possess technical expertise that gives them a comfortable relationship with researchers in complementary disciplines but reduces their ability to communicate with other geographers who do not share the same interests. *Rediscovering Geography* (NATIONAL RESEARCH COUNCIL 1997) provides a useful summary of the current status of the field of geography and its relationship to other disciplines.

Finally, the fact that this project focuses on an areal unit, Brazil, raises additional questions. While many geographical studies, especially within the regional tradition, have dealt explicitly with a recognized spatial area, much of the recent work has taken on a more systematic focus. Though a research project may have been conducted in Brazil, the major thrust of its report in the literature is likely to be a topic that transcends political boundaries or areal definition. Much of the human-based information about Brazil is contained (buried?) in articles or books dealing with socio-economic conditions across Latin America or the Third World. Meanwhile, physical-based research on Brazil may appear in articles focused on tropical and subtropical environments published in journals in the physical, environmental, or biological sciences. The Brazil connection is not always evident in the title, abstract, or description of a report.

Before discussing these issues more thoroughly in the next section, I will present a general overview of the history of Brazil-centered geographical work. Following the discussion of the shifting trends in geography (and the resultant impact on studies about Brazil), some of the contributions of key individuals will be outlined. In the final section of the paper I will attempt to provide a snapshot of important work produced in recent years and offer some comments regarding current directions and expectations for the future.

A fundamental question arising from any endeavor to review a body of scholarship relates to the definition of boundaries. What gets included and what is left out? The issue is especially difficult for geographical studies because: 1) all geographers do not agree on the core definition of the discipline, and 2) much of geography overlaps the realms of other disciplines. One possible approach is to establish strict criteria, draw the line, and omit consideration of everything not meeting the requirements for inclusion. For example, only articles published in a set of journals, deemed to represent geography, would be looked at. Publication by an academic press could be used as a litmus test for books. Another test might be the self-identification of the scholar; does he/she refer to him/herself as a geographer?

² The term Anglo-American will be used throughout to indicate sources from the United States and Canada. Scholarship interchange between the two nations is pervasive, yet works from other, non-English speaking nations of North America do not share the same outlets.

A second approach is to focus on a core of scholarship while also including reviews of additional work from the boundary regions with other fields. This presents the advantage of recognizing that much of what can be characterized as geographical work appears in non-geographical publications. A disadvantage is that responsibility for determining what gets included rests solely with the reviewing author. Because different people might have different definitions of geography or might evaluate the relevance of a work differently, the decisions about inclusion and exclusion can be expected to vary greatly from one reviewer to another.

In this study I have selected the second option. I prefer to focus on what I consider to be the core of the discipline, and where appropriate, include discussion of works that other geographers might omit. I recognize that following this approach will cause my decisions to be questioned. The absence of an article or book from this review might indicate that: 1) in my estimation its consideration does not fit the general objective of this report, or 2) the item is unfamiliar to me. Neither of these conditions means that it is unimportant.

The next task is to define the core of the discipline. Three general conditions were used as starting points for identifying which scholarly works should be considered. The criteria were not exclusive, however, and where it seemed useful, additional material was examined. A work was reviewed if:

1. Its author calls him/herself a geographer; or
2. It appeared in a recognized geographical journal such as: the *Annals of the Association of American Geographers*; the *Professional Geographer*; *The Geographical Review*; *Yearbook of the Conference of Latin Americanist Geographers*; and others; or
3. The scope of the research appeared to conform to one of the mainline traditions in geography, including a focus on: spatial relationships; the interaction between humans and the physical environment; or the general description of an area (regional tradition).

Meeting any of the above conditions was sufficient reason for subjecting the work to review. Of course, these conditions were in addition to the criteria derived from the stated purpose of the project; namely, to examine research about Brazil conducted over the past half century by North America-based scholars. The literature survey focused on United States and Canada-based publications, so articles written by residents of these nations but printed in foreign journals were usually not included. Though geographers in the United Kingdom have contributed greatly to English language scholarship on Brazil, the constraints of space and the stated objectives of the project have limited the references to our European colleagues. Among the many works thus omitted are the those by Peter Furley, Anthony Hall, Joe Foweraker, Jay Mistry, John Dickenson, Michel Eden, Chris Barrow, and others.

This study examined published English language journal and book materials. A more exhaustive effort might include an evaluation of scholarship in other languages, especially Portuguese; as well as Ph.D. dissertations, university course titles, and course content indicated through interviews with instructors.

GENERAL DESCRIPTION OF THE STUDIES OF BRAZIL BY UNITED STATES AND CANADA-BASED GEOGRAPHERS SINCE 1945

A. Background; Early explorations and descriptions.

Much of what is considered to be early geographical writing is contained in descriptions produced by individuals who traveled to little known (to Western society) exotic lands. Brazil was explored by many, including the German Alexander von Humboldt at the end of the 18th century and the Englishman Richard Burton who, in the 1860s, encountered English-speaking immigrants from the United States South in the São Francisco valley (BURTON 1969). Louis Agassiz also spent time in Brazil as did other, less famous travelers. During the middle of the 19th century Rev. James C. Fletcher (1845) published a book describing the wonders of Brazil. A later elaboration entitled *Brazil and the Brazilians*, jointly authored with Daniel Kidder (FLETCHER and KIDDER 1856), became a major success and went through several printings up until 1879. The book's glowing descriptions of an attractive agricultural environment and friendly people were major stimulants leading thousands of disillusioned Americans from the Southern Confederate states to relocate to Brazil after the American Civil War.

The output of descriptive books about Brazil has continued up to the present. This tradition includes great diversity, ranging from tales of early travels through the Northeast (KOSTER 1966) to journalistic observation (GUNTER 1966) to photo-rich adventure tales (SCHREIDER; SCHREIDER 1970) to travel guides and tourist aids (DRAFFEN et al 1997). Though these and countless similar works might be characterized as geographical (regional description; elements of the physical geography, etc.), they fall outside the mainstream of scholarly work. Meanwhile, a small but committed group of professionals has worked over the years to build a substantial body of knowledge within the discipline of geography using critical observation, scientific methodology, rational analysis, and peer-reviewed reporting.

B. Mid-Century regional studies.

By the end of the Second World War much of geography was focused on regions. Research involved describing conditions or analyzing problems associated with particular areas, and an important theme repeated in many reports was that these areas were unique or at least distinctive. Latin America was the focus of a substantial amount of interest. By this time major figures within the discipline had published work on Brazil, sometimes within the larger context of Latin or South America (WHITBECK et al 1940; WILGUS 1943; PLATT 1942). This period marked the emergence of a group of regional specialists who engaged in significant field work in Brazil. Among the early group were Leo Waibel and Preston James, who would become the most prominent of all Latin Americanists focused on the study of Brazil. His often-reprinted book, *Brazil* (JAMES 1946), was the best regional treatise on that country, and it might be considered the geographical counterpart to sociologist T. Lynn Smith's *Brazil: People and Institutions* (1946) and (somewhat later) anthropologist Charles Wagley's *An Introduction to Brazil* (1963).

Works on regional geography were published in a variety of journals, but the most significant outlet for Anglo-American researchers was *The Geographical Review*. During the late 1940s and 1950s articles describing settlement in northern Paraná (DOZIER 1956), resource extraction and land use in the Amazon (HIGBEE 1951), Brazilian agricultural development (JAMES 1953a), the siting of Brazil's proposed new capital (JAMES; FAISSOL 1956), the basin of the São Francisco river (JAMES 1948),

and land use in the central plateau (WAIBEL 1948) appeared. Clarence Jones (1958) also contributed a general description of Brazil, and he and Preston James wrote the definitive summary of the field of geography of that day (JAMES; JONES 1954). As might be expected, the work heavily emphasized regional research.

In the late 1950s two other geographers emerged as leading researchers: Hilgard O'Reilly Sternberg and Kempton Webb. Continuing in the tradition of their predecessors, they have devoted much of their efforts to the study of Brazil and Brazil-related topics. Through their positions at the University of California in Berkeley (Sternberg) and Columbia University in New York City (Webb), they were able to exert significant influence, not only within geography, but also through inter-disciplinary collaborative projects. Their active professionalism and commitment to Brazilian studies inspired many students, and several important present-day scholars benefitted from their tutelage. These geographers remained focused on their area of interest even as a significant segment of the geographical discipline was diverted away from regional and human-environment interaction studies.

C. Recent shifts to systematic reports.

Though the regional tradition in geography has persisted, beginning in the 1960s researchers became more interested in analyzing systematic problems or conditions than in describing defined areas of the earth's surface. The shift in focus was a response to changing values, improved investigative skills, developing computer technology, and increased familiarity with quantitative tools. During and since this period geographers have also become more concerned with social and environmental problems, a trend that parallels changes in other related social sciences. Studies have included prescriptions for redressing flaws in social or political structures. Geographers were among the most vocal early critics of the Brazilian government's policies (supported by international agencies) which encouraged increased population densities and the destruction of the natural vegetation of the Amazon region. (HIRAOKA 1982; DENEVAN 1973; HECHT; COCKBURN 1989).

Much of the research on Brazil has also reflected an evolution and improvement in the way geographers conduct their craft. Moving beyond basic description, most contemporary studies are carried out within a framework of critical assessment, careful data collection, hypothesis testing and quantitative analysis (where applicable). The technologies of GIS and remote sensing analysis are also beginning to affect studies by American scholars working on Brazil. The impact, however, has not been as significant as might be expected given the explosive increase in the use of these applications in the United States.

The preceding paragraphs have provided a brief sketch of the trends in geography research by Anglo-American scholars working in Brazil, and a more extensive discussion will follow over the next several pages. Though some scholars continue in the regional tradition of James, others have followed new paths. Over the decades, however, one element has remained constant. Geographers studying Brazil have continued to engage in fieldwork. It is certainly possible to conduct geographical research by relying on second-hand or remotely gathered information, but I am unaware of anyone claiming to be a Brazilianist geographer who has not had intimate and frequent contact with Brazil. Most Brazilianists make use of any excuse to travel to the "field," attracted perhaps as much by the friendly hospitality of the Brazilian people as by the need to collect data.

ANALYSIS OF THE TRENDS IN SCHOLARSHIP IN THE GEOGRAPHICAL STUDIES OF BRAZIL

A. Significance of the field of geography within the social sciences.

The field of geography, which means description of the earth, has a long history. Over the years, however, our understanding of “description of the earth” has changed. Though we trace geographical thought back to the ancient Greeks, many of the modern features of the discipline were established during the late 19th and early 20th centuries. There is inadequate room here to elaborate on the sometimes compulsive self-examination that our discipline has undertaken in its attempts to define the scope of the field. Though geographers' understanding of their mission may vary, most have found a niche among the social sciences by becoming one or more of the following:

- a. Regional experts.
- b. Specialists on the complex relationship between humans and the physical environment.
- c. Developers and appliers of new quantitative and digital spatial analysis tools.

In these capacities, geographers have been able to contribute significantly to knowledge about the world. Because the discipline is not limited to the study of a single category of event, geographers feel free to examine almost anything within an associated spatial or distributional context. For this reason, geography is often considered a dimensional field (as history focuses on the temporal dimension) linked to two-dimensional space on the surface of the earth. This means that geographers frequently find themselves using and contributing to knowledge in other fields, including most of the social and some of the physical sciences. Geographers, sometimes referred to as spatial analysts, human ecologists, or other by euphemisms, are often viewed as integrators and synthesizers of information developed outside the discipline.

B. Changing paradigms in geography.

Regional description.

For much of the 20th century geography was considered to be, at its foundation, an ideographic field. In the tradition of Carl Sauer, Preston James, and others, it was believed that a geographer's most important contribution was to develop expertise on the unique characteristics of spatially distinguishable areas, described as regions. A region was conceived of as a portion of the earth's surface that possessed significant internal homogeneity and was substantially different from neighboring areas. Of course, deciding what variables would be used to identify homogeneity, and thus define a region, became a consuming task. From this perspective, the most important differentiating characteristic among research reports was the area of study. A common set of systematic topics was applied to many different countries or regions within countries. Geographical presentations featured descriptions of far-flung areas, but most followed a standard outline: the physical landscape, the cultural or settlement history, population characteristics, important resources, agriculture, etc. Every geographer was expected to possess a regional specialty and to become thoroughly familiar with his/her chosen area. Most geographers were also urged to develop good command of one or more foreign languages. Regional geographers had, to some extent, a point of view similar to that of many cultural anthropologists engaged in ethnographic case studies.

Regional specialization was abetted in the early 1960s by financial support from agencies such as the Ford Foundation's Social Science Research Council, the Guggenheim

Foundation, and others. In the late 1940s the United States federal government established the Fulbright foreign fellowship program, and many graduate students completed research for their degrees by making use of the available funding. The Peace Corps also attracted idealistic young Americans to foreign areas, and Brazil received its share of volunteers. Several of these came back to the United States filled with enthusiasm and a desire to continue to study the country with which they had gained familiarity. They often went on to pursue graduate degrees as regional specialists.

Spatial analysis using quantitative methodologies.

Beginning in the 1960s, geography pioneered new directions. Critical of the descriptive tradition and claiming that geography should attempt to be more scientific, a new generation of scholars applied sophisticated quantitative techniques to massive stores of data. They attempted to tease out sometimes obscure relationships and spatial patterns from complex sets of data by applying statistical analyses and the power of digital computers.

A parallel trend involved the extensive use of models based on simplifying assumptions which reduced reality to a homogeneous plain populated by perfectly rational human beings. Land rent functions, hexagonal central place networks, and gravity-analogous interaction models became widespread in the literature. The new generation eventually hoped to discover universal laws and theories that could be used to predict human spatial behavior. Inevitable conflict arose between the advocates of the "new geography" and the "old-timers," and sometimes the differences surfaced in heated exchanges at professional meetings.

Paralleling the quantitative movement in geography was a trend toward greater social awareness and responsibility. Reflecting the general political climate during the Viet Nam War period, several geographers looked at events through the socialist/Marxist lenses of oppression and class conflict. Rather than a means for discovering knowledge, research became a mechanism for advancing a social agenda. Of course, geography was not unique among the social sciences in this regard.

New technology and applied geography studies.

During the decades since the 1960s and early 1970s, the paradigm lurches have given way to a more balanced evolution of the discipline. Some practitioners, still committed to the view that geography's greatest contribution lies in providing expert knowledge about foreign areas, continue in the regional tradition. Though this orientation does not come close to being as strong as it was earlier in the 20th century, it is still recognized as a valid pursuit within the discipline.

Most geographical studies today, however, are not purely regional. They incorporate some of the elements expressed by the movements initiated 30 to 40 years ago. Studies in land use or political geography, for example, often include the purpose of highlighting problems and suggesting better alternatives to current practices. Quantitative analysis has become more sophisticated, and most important, the users of complex techniques have become much more skeptical of the quality of the data available from public sources such as the census tables. They have also developed a better knowledge of the limitations of the tools that are being employed.

Finally, the most significant development in recent years in geography has been the creation of new spatial analysis tools. Geographic information systems (GIS), or the analysis of sets of digitally integrated spatial information, has become the single most important sub-field within the discipline. Coupled with the related areas of global positioning systems (GPS), computer cartography and remote sensing analysis, GIS has made it possible for geographers to gain and apply knowledge in ways that were

not possible in the past. New careers in the public as well as private sectors have opened up, and the ongoing improvements in computer hardware and software ensure that the field will continue to boom. Consequently, much of the research in geography has taken on a decidedly applied character. The tools are used not only to uncover knowledge, but they are also powerful devices for discovering solutions to problems.

C. Reflection of paradigm shifts in the studies of Brazil.

How have the changes in geography affected studies of Brazil? Before the quantitative revolution of the 1960s, geography's focus was primarily regional. Under this paradigm, Brazil was a natural target of study. This large country with a broad range of physical and cultural landscapes has often captured the imagination of Anglo-Americans. The articles written for geographical journals dealt with many specific topics, but the subject was usually considered as an interesting, and perhaps unique, feature of this region known as Brazil (or Amazonia, or Northeast Brazil, etc.). Focus was on the area itself. Almost all of the studies up through the 1950s followed in this tradition. Higbee's (1951) comprehensive description of human activity in the Amazon, or Dozier's (1956) exposition on northern Paraná introduced these areas to their readers as unique and interesting places with particular sets of physical and human characteristics.

The regional perspective is still widely applied in studies of Brazil. General descriptions of the country in recent years, especially in some text books, have relied on the traditional themes of regional geography: physical bases, settlement history, land use, urbanization, resources, transportation, etc. (MOMSEN 1968; JAMES and MINKEL 1986; MORRIS 1987; BLOUET and BLOUET 1997). Much of the later research, however, has reflected a shift away from a focus on the area itself and toward the topic under consideration. For example, in 1951 Higbee described a wide variety of interesting aspects of human occupation of the Amazon, including information about vegetation, rubber extraction, settlement history, etc. While more recent works about the Amazon still include a careful analysis of the special characteristics that differentiate the region from others, they seem to be primarily concerned with the systematic topic under consideration; be it the black earth (*terra preta*) areas, boom town development, sex ratios, or the trans-Amazonian highway.

Interestingly, the new quantitative techniques were seldom applied by Anglo-American scholars in studies of Brazil. Great Britain's John Peter Cole (1965) produced a text on the social and economic geography of Latin America that incorporated some of the new methods. After visiting Brazil, trail-blazing quantifiers Peter Haggett and Brian Berry conducted research on soil erosion in the Serra do Mar (HAGGETT 1961), looked at soil sampling in Minas Gerais (HAGGETT 1963), and used principal components analysis to define homogeneous economic regions (BERRY; PYLE 1972). Later, Dawsey (1979a) also applied principal components analysis to examine the relationship between destination *municípios* and the source states for migrants moving into southwest Paraná. These efforts were the exception rather than the rule. The regional specialist doing work in Brazil and familiar with the Portuguese language was usually not interested (nor perhaps trained) in quantitative methods and statistics.

Additional technical problems came into play. The quantifiers were fond of mining data generated by government agencies, and Brazilian centers such as the Fundação Getúlio Vargas and the Instituto Brasileiro de Geografia e Estatística were good potential sources. However, these data were not readily accessible to Anglo-Americans. Brazilian census tomes were available only in limited locations in the United States, and the collections were sometimes incomplete or out of date. Unreliable mail service in an

era before electronic data transfer ensured that Anglo-American researchers wanting to use Brazilian data almost had to go to Brazil to find it. Furthermore, few Anglo-American users of the quantitative techniques had a sufficient knowledge of Portuguese to work with the information once it had been obtained. Finally, serious questions were raised about the validity of some of the data collected for several of the Brazilian census reports.

As a consequence of these conditions, the quantitative revolution was carried forth, not by Anglo-Americans, but primarily in Brazil by the Brazilians themselves. Led by United States-trained scholars such as Speridião Faissol and Pedro Pinchas Geiger, Brazilian geography developed a core of practitioners who were knowledgeable in many of the techniques being used in the United States and Western Europe (FAISSOL 1980).

In a similar vein, the new digital cartographic and GIS tools most often have been applied by Brazilian researchers rather than Anglo-Americans. Much of the applied GIS in the United States has moved from the university campuses to planning agencies and private corporations. Spatial analysis in Brazil is being capably performed by foreign firms under contract and by local agencies such as the Centro de Análise e Planejamento Ambiental (CEAPLA) or the Instituto Nacional de Pesquisas Espaciais (INPE). The use of remotely sensed imagery in and of Brazil (including the radar mapping of the Amazon region under project RADAMBRASIL), also more often has involved Brazilians rather than Anglo-Americans (MOMSEN 1979).

In summary, the "Brazilianist Geography" performed by Anglo-Americans is not as clear-cut today as it was during the period of regional specialization. Though some may work more or less exclusively on Brazilian topics, most present-day geographers would consider themselves to be systematic specialists, such as urban geographers, historical geographers, environmental geographers, etc., who happen to have an interest in Brazil. As an example, Professor Jock Galloway has written about the historical geography of Northeast Brazil (GALLOWAY 1968; 1975), but he has also studied sugar cane production in many other regions of the world (GALLOWAY 1989; 1996). Most geographers focus on themes that transcend the political boundaries of one country. So, while a significant amount of geography is being done by Anglo-Americans in and about Brazil, the work is not as directly linked to that region as might have been true few decades ago.

D. Other factors affecting the trends.

Economic and political developments in Anglo-America and Brazil.

Political events in and outside Brazil have helped shape Anglo-American studies of that country. The decade of the 1960s was an eventful period. In the United States, the idealism of the Peace Corps returnees, the growing social consciousness among academics, and the unrest caused by the Viet Nam war had an impact on scholarship. Meanwhile in Brazil, the instabilities of the Quadros and Goulart governments, followed by the 1964 takeover and subsequent military rule under Castelo Branco and others, influenced the agenda of Anglo-American researchers. Political oppression, social differences, and injustice became important topics. Land tenure studies, stimulated in part by the Land Tenure Center at the University of Wisconsin, abounded. Rather than produce traditional land use maps of rural areas, some geographical research focused on comparing income among urban classes and highlighting the effects of the inequities in society (OESTERHOUDT 1965; LUDWIG; TAYLOR 1969; LAND TENURE CENTER 1972). Cultural change in Brazil was the theme for the 1969 annual meeting of the Midwest Association for Latin American Studies (RIPPY 1969).

Much of the zeal for social and political reform has been replaced by a concern over the destruction of the natural environment and disappearance of Indigenous communities. The growing awareness of biological interdependencies, new signs of global warming, and increasing toxic pollution have spurred many studies. The growth of the environmental movement occurred during a period when the Brazilian government, supported by outside funding, was making a determined effort to bring economic development to the Amazon region. Population densities increased, much of the forest was leveled, Indigenous societies were destroyed, and rivers were contaminated with mercury produced by mining activity. Events in Brazil have seriously endangered a significant portion of the earth's biological and cultural diversity. The Amazon region, therefore, has been the most important focal point for research by Anglo-American geographers during the past two decades.

Another factor that may have led Anglo-Americans to center their activity on north Brazil is that most of the economic growth in the country has taken place in the core areas of the Southeast. The state of São Paulo and neighboring regions might easily be classified as part of the developed world. The industrial and service-based economy of this area, as well as the associated problems, is in many ways similar to that of regions in the United States and Western Europe. Though the Brazilian core certainly warrants continued study, it probably no longer captures the imagination of Anglo-Americans as it once did. This region may be perceived to be well-off (and therefore a less interesting research target) in comparison to the North or Northeast. Among Anglo-Americans there may be a notion that the people of Southeast Brazil possess sufficient financial and technical resources to study the important issues of that area. And finally, the problems of the Southeast (and there are many) are not viewed as having the global importance of those linked to the Amazon area. Destruction of the rain forest is presented as a threat to world-wide (and Anglo-American) well being, while, for example, the pollution of the Tietê river might be viewed as a local issue of interest only to Brazilians. Though an objective examination has not been performed, this perception is likely reflected in the lack of research funding available for studies in the Southeast compared to those focused on the North.

FOCUS ON LATIN AMERICANIST INSTEAD OF BRAZILIANIST GEOGRAPHY

The percentage of geographers in Anglo-America who consider themselves to be predominantly regional specialists has dwindled, and within that group, the portion interested in Brazil has also decreased. Academic programs (and perhaps region-based sections in government agencies) have been consolidated. Fewer university faculty are hired for their knowledge of distant lands, and among the regional positions still available, very few are reserved for Brazilianists. Most institutions, outside a handful of the very top graduate programs, will fill a position with a Latin Americanist geographer who has specialized in a Spanish-speaking region of the continent. Because that language is spoken in a large number of nations, and because of the Hispanic community resident in the United States, a non-Brazilian focus may be viewed as being more useful to an academic program. Of course, this ignores the overwhelming relative importance of Brazil among the nations of Latin America.

Portuguese is taught almost exclusively only at the college level in this country, and then usually at the advanced undergraduate level in those limited schools where it is offered. Portuguese is almost always a second language (after Spanish) acquired by a graduate student contemplating field work elsewhere in the Western Hemisphere.

Travel to Brazil is more expensive than to nearer Latin American countries. The presence of many immigrants in the United States from Puerto Rico, Cuba, Mexico, and various Central American republics has created a sizable Spanish-speaking community, and this presence highlights the usefulness and relevance of that language as well as topics pertinent to those countries. More distant Brazil, in comparison, is erroneously perceived to be less significant.

DEVELOPMENT OF GEOGRAPHY AT THE IBGE AND BRAZILIAN ACADEMIC CENTERS.

The native Brazilian discipline of geography has been remarkably active. To describe the evolution of the field and the many contributions of the Brazilians is beyond the scope of this report, but there has been a relationship between this development and the activities of Anglo-American geographers. During the first half of the 20th century geography in Brazil was shaped by the French tradition. Pierre Deffontaines arrived in Brazil in 1934, and he was instrumental in establishing the Associação de Geógrafos Brasileiros in 1936. The *Revista Brasileira de Geografia* was organized during the same year under the French influence, though the journal was modeled on the North American *The Geographical Review*. Deffontaines was followed at the University of São Paulo by Pierre Monbeig who also greatly stimulated Brazilian geography (JAMES 1972, 320).

During the decade of the 1940s and early 1950s Brazilian geographers came in contact with several Anglo-American researchers. Leo Waibel, a German-born immigrant into the United States, studied areas of the central plateau in Goiás, and during the period interacted with Brazilian colleagues. According to Speridião Faissol (1996), among Waibel's experiences in Brazil was an unhappy meeting with a German community in Goiás that had remained sympathetic to Nazism. Waibel had fled Hitler's regime.

The most significant contacts between Brazilians and North Americans during this time occurred because of Preston James' interest in Brazil and his prominence in the United States. Faissol gained a scholarship and earned a doctorate at Syracuse University under James, and soon thereafter, he returned to Brazil to become the head of the Conselho Nacional de Geografia (later renamed the Instituto Brasileiro de Geografia e Estatística (FAISSOL 1996). Waibel, James, and Faissol worked together on one of the important geographical topics of the 1950s: where to locate the new capital of the country (JAMES; FAISSOL 1956). Augelli (1963) later criticized the choice of the location in the interior state of Goiás.

The quantitative revolution of the 1960s arrived in Brazil with the visit of John Peter Cole from the University of Nottingham, England and Brian J.L. Berry from the United States in 1969. Their presentations and scholarly output (BERRY; PYLE 1972) were important stimulants to Brazilians such as Faissol, Pedro Pinchas Geiger, Marília Galvão and others. The change in direction in Brazilian geography was reflected in the content of two comprehensive works that appeared during the decade of the 1970s. In the two-volume *Brasil: a Terra e o Homem*, edited by Aroldo de Azevedo (1970) and published by the University of São Paulo Press, the treatment of physical and human geography was still relatively traditional: rivers, mountains, population, ethnic groups, cities, etc. Seven years later, many of the chapters in the five-volume set *Geografia do Brasil*, produced by the IBGE (1977), included trend surfaces, principal components, and various other forms of quantitative analysis. Application of quantitative

techniques continued into the 1980s and 1990s in a variety of physical and human geographical studies (PINTO 1986; USP 1993).

During subsequent years Brazilian geographers also developed competence in the use of air photography and satellite imagery (downloaded directly to Brazilian ground stations). The imagery was useful in Brazil where overland access to remote areas was difficult. Radar was especially valuable because of its ability to penetrate the persistent cloud cover of tropical areas. Use of GIS has also become widespread in Brazil. Applied to a variety of topics, the new technologies are being used to address some of Brazil's most pressing problems.

In summary, therefore, the discipline of geography in Brazil developed a solid base and has fared well in recent decades. Government sponsored financing through CAPES, CNPq, FAPESP, and other agencies has supported education abroad as well as domestic investigations. Institutions of higher learning have continued to produce capable scholars and researchers who investigate a wide range of internal problems. Brazilian scholarship is healthy, and in comparison to their Anglo-American counterparts, Brazilian geographers have taken greater interest in the regions nearest at hand: the urbanized centers and the core agricultural areas of the Southeast. Though many Brazilian individual researcher, academic communities, and agencies are active in the Amazon region (often in partnership with Anglo-Americans), that area does not dominate geographical interest as it does for United States and Canada-based investigators. To some extent, therefore, there has been a regional partitioning of research. Anglo-Americans concentrate their efforts in the tropical North while Brazilians, though active throughout the country, focus on the Southeast. This division not only reflects a difference of interests but also relates to more mundane issues such as: the availability of funding for research, the location of major sources of data, familiarity and access to the scholarly literature, travel experiences, and the residential location of the scholar.

IMPORTANT ACADEMIC FIGURES WHO SHAPED GEOGRAPHICAL STUDY OF BRAZIL

A. Preston E. James.

The direction of Anglo-American research on Brazil has been shaped by more than paradigm shifts in the discipline, social currents in United States academia, and the emergence of Brazilian scholarship. It is also the result of personal interest and commitment. Though many scholars have devoted a large amount of energy to geographical studies in Brazil, three stand out because of their long-term impact: Preston James, Kempton Webb, and Hilgard O'Reilly Sternberg.

Preston E. James was the earliest, and perhaps the most significant, of the Anglo-Americans to shape geographical research on Brazil. Born in Brookline Mass. in 1899, he completed a bachelor's degree at Harvard University and a masters and PhD at Clark University. He was a member of the faculty at the University of Michigan for 18 years before going into government service during the war years. After 1945 he moved to Syracuse University where he went on to serve as department head and eminent scholar until his retirement in 1970. Preston James published extensively on many Latin American areas, and his textbook, *Latin America* (latest edition: JAMES; MINKEL 1986) was the most important regional text for more than a generation. He also produced a general text on systematic geography (James 1966). James wrote about trends in geography (JAMES; JONES 1954; JAMES 1978), and his *All Possible Worlds* (JAMES 1972; MARTIN; JAMES 1993) has dominated studies of the history of geographic thought since the 1970s.

James' works on Brazil were numerous and wide-ranging. He examined coffee production (JAMES 1932), the embryonic iron industry (JAMES 1939), and general patterns of industrialization in São Paulo (JAMES 1935). He looked at rural areas of the Northeast (JAMES 1952; 1953b) including the valley of the São Francisco river (JAMES 1948), and he described the agriculture of the country as a whole (JAMES 1953a). He investigated topics in physical geography and geomorphology as well as human geography (JAMES 1959). His frequently reprinted text on Brazil (1946) was a landmark guide to anyone interested in the geography of that nation, and he often wrote essays for the *Handbook of Latin American Studies* (JAMES 1944) commenting on the development of geography in Brazil.

James was certainly one of the most important geographers of his day (see descriptions of his work in Meinig 1971; and Robinson 1980), and his interest in Brazil placed that country among the most popular targets for area studies. His textbooks impacted students as well as teachers, and his ideas greatly influenced the geographic thought of his day. His early connection with Faissol and other Brazilians helped to influence the direction of geography in Brazil.

B. Kempton Webb.

Kempton E. Webb was born in Malden, Mass. in 1931, a date by which Preston James had already spent eight years as a faculty member at the University of Michigan. Following in the footsteps of fellow Massachusetts native James, Webb also received his undergraduate degree from Harvard. He went on to complete a PhD in 1958 under James at Syracuse. Following a brief period in Indiana, in 1961 Webb moved to Columbia University where he joined other Brazilianists, including anthropologist Charles Wagley, to form a strong, Brazil-focused interdepartmental program. During most of the 1960s he served as the director of Columbia's Institute of Latin American Studies.

Webb's major scholarly contributions addressed highly specific matters, such as urban food supplies (WEBB 1959a) and food production in Minas Gerais (WEBB 1959b); but he also wrote on broader topics including a comprehensive report on the evolution of the landscape in Northeast Brazil (WEBB 1974). His general works on Brazil (WEBB 1964; 1968; 1969; 1970; and 1980) and Latin America (1967 et.al.) were highly regarded, and they helped to shape American academic views of the country.

As director of the Institute of Latin American Studies, Webb played an important role in developing interdisciplinary studies focused on Brazil. Perhaps the most significant (for Brazilianists) publication to be released by the Institute was *Brazil: Field Research Guide in the Social Sciences* edited by Robert Levine (1966). The volume included a comprehensive case study illustration of how a geographical investigation might be conducted in the state of Goiás (MANDELL 1966). It is interesting that the outline of the article is firmly set in the regional tradition: demography, migration/colonization, settlement, economic activity in general, agriculture and transportation. The quantitative movement was still a few years off.

Webb also wrote frequently for the *Handbook of Latin American Studies* describing the status of Brazilian geography. Through his work at the Institute and his personal connections to various organizations (CLAH, LASA, Ford Foundation, Consortium of Latin American Studies), Kempton Webb exerted a strong influence on studies in and of Brazil. Perhaps one of his greatest contributions was his support of the idea that good research is accomplished by teams transcending disciplinary boundaries. Following his retirement from Columbia, Webb spent a brief period during the early 1990s as head of the department of Geography and Anthropology at William Paterson college in New Jersey.

C. Hilgard O'Reilly Sternberg.

Hilgard O'Reilly Sternberg is a Brazilian, born in Rio de Janeiro in 1917. Though a substantial portion of his professional career was spent in Brazil and though he has published extensively in Portuguese, a review of Sternberg's work is included here because of his impact on geography in the United States. He received advanced degrees in three countries: a Ph.D. from Louisiana State University in 1956; Doutor em Geografia from the Federal University of Rio de Janeiro in 1958; and the Docteur *honoris causa* from the University of Toulouse in 1964. Since 1964 Sternberg has held a position in one of the most prominent geography departments in this country; the University of California at Berkeley. During his long career (today his position is emeritus) Sternberg has published widely in the U.S and abroad, held important positions in national and international organizations (including vice president of the International Geographical Union), and received significant awards including the Order of Rio Branco from the Brazilian government in 1967.

Sternberg considers himself an "issues oriented" geographer. He has a lengthy publication record on many different topics, but most of his work has dealt with various aspects of the human-physical interface. Among his most notable contributions are: general works on Brazil (STERNBERG 1948; 1955; 1956; 1965; 1970; 1975), reports on the status of geographic thought in Brazil (STERNBERG. 1951; 1959;), studies of flooding in the Paraíba Valley (STERNBERG 1949; 1950), research on drought in the Northeast (STERNBERG 1952; 1958), and articles about the Amazon region (STERNBERG 1981; 1987; 1995a and 1995b). In addition to his extensive research and publication record, Sternberg has shaped the course of Anglo-American scholarship through his students. As a prominent Brazilianist in a strong department with a historical commitment to studies of the relationship between people and their environment, Sternberg has attracted outstanding students with an interest in Brazil. Today, scholars from the Berkeley tradition such as Brian Godfrey, Nigel Smith, and Robert Voeks are among the most prolific publishers on the geography of Brazil. The influence of Sternberg has been carried forward to a new generation.

RECENT GEOGRAPHICAL STUDIES OF BRAZIL.

A. Sub-fields targeted by United States and Canadian geographers in recent years.

General Works.

As discussed earlier in this report, establishing a boundary between Brazil-focused geographical work and scholarship in other sciences is sometimes difficult. For example, the description of Minas Velhas in interior Bahia, which anthropologist Harris (1956) presented in *Town and Country in Brazil*, might easily be classified as regional geography. Likewise, sociologist T. Lynn Smith's (1946) chapters on agriculture, population distribution, migration, and land tenure are also geographical. Many contemporary works fall into a similar category. Following in the footsteps of geographer Waibel (1950), historian Luebke (1987) wrote about German settlers in southern Brazil. Chapter 1 provided maps of the settlement pattern, house types, and several other characteristics within the domain of cultural geography. Historians Stanley Stein (1970) and Warren Dean (1969; 1976; 1987) also contributed significant geographical information about Brazil. Published after his untimely death, Dean's (1995) description of the destruction of the *Mata Atlantica* forest in Southeast Brazil raised public awareness of the consequences of environmental neglect. Drawing on property records,

Brannstrom (in press_a) has shown that the biophysical category "Atlantic forest" used by Dean really consisted of a mixture of forest and savanna land types, each with a different perceived fertility and market value.

Several sources continue to provide fundamental geographical information about Brazil. General regional information is widely available in travel guides, dictionaries, encyclopedias and on the Internet (CENTRAL INTELLIGENCE AGENCY 1999; GALLOWAY 2000). Though most current geography textbooks on Latin America have adopted a systematic outline (separate chapters on physical landscapes, settlement history, population, agriculture, industrial development, etc), some in recent years have followed the more traditional layout by allocating separate chapters to the various countries (JAMES; MINKEL 1986; MORRIS 1987). The chapter on Brazil by Galloway (1983) in the book by Blakemore and Smith (1983) provided a good summary of Brazil's historical geography. *Focus* devoted an entire issue to an attractively illustrated and well-written article by Brian Godfrey (1999a) which presents one of the best concise descriptions of Brazil to appear in recent years.

Other information about Brazil is contained within the more specific topical literature on Latin America. Current popular textbooks follow this approach. Though the book by Blouet and Blouet (1997) includes a chapter by Gary Lobb (1997) on Brazil, most of the information on the country can be found in the earlier chapters on physical environment, aboriginal and colonial geography, agriculture, population, cities, and economic activity. In addition to the standard geographical topics, Clawson's (2000) text on Latin America (detailing much about Brazil) includes headings that are not commonly found elsewhere. Among others, he devotes space to chapters on religion, tourism, health, and social class. Caviedes and Knapp (1995) also use a systematic approach, and the chapters on "South America in the World Economy," "Settlement Networks and Urban Systems," "the South American State," and "Cultural and Ecological Survival" include substantial information on Brazil.

The tendency toward a systematic organization of chapters in textbooks dealing with Latin America reflects the move away from a purely regional toward a topic-focused approach in research. Geographers with experience in Brazil collaborate frequently with colleagues working in other regions of Latin America, Africa, and the Far East. Brazilianist geographers have found substantial support and comradeship within the Conference of Latin Americanist Geographers (CLAG), and several collaborative projects have developed because of personal contact among members at the annual meetings. CLAG's *Yearbook* has provided a forum for scholarly exchange, and many articles have been published on Brazilian topics. The special editions of the *Yearbook* devoted to 10-year inventories of the status of Latin Americanist geography (MARTINSON; ELBOW 1981; MARTINSON 1992) have been useful, as have other summary reports of Latin Americanist activity (ROBINSON 1989; HEWITT 1995). During recent decades, Hiraoka (1977-1991) and Muller (1994- present) have provided a valuable service by reviewing geographical scholarship on Brazil for the *Handbook of Latin American Studies*. Following in the footsteps of Webb, James, and Waibel, they have prepared essays and abstracted articles for publication in the odd-numbered social sciences-focused volumes of the *Handbook* released every two year.

Historical, cultural and political geography.

The remainder of this report will attempt to summarize important recent topical geographical research conducted in Brazil. Though grouped according to broad sub-disciplinary categories, much of the work defies classification. By definition, geography is integrative and disrespectful of the boundaries among the sciences, and this applies

to boundaries within the discipline as well. Though some examples of pioneering works are listed, most are drawn from research performed during the past two decades.

Many of the studies which have focused on specific ethnic groups or settlement communities might be classified as historical or cultural geography. Though not recent, Augelli's studies of Bastos, a Japanese colony (AUGELLI 1958a), and Varpa, a Latvian community (AUGELLI 1958b), contributed to our knowledge of the adaptation of immigrants in Brazil. Muller (1974) studied the pioneer settlement of Toledo in the southern state of Parana. More recently, the small village of Marques in interior São Paulo was described by Dawsey (1989), and Gade (1994) wrote about change within the German ethnic communities of south Brazil.

Another group subject to recent scrutiny was the descendants of Anglo-Americans who emigrated to Brazil immediately after the Civil War (DAWSEY 1993; DAWSEY; DAWSEY 1995). Known as the *Confederados*, the immigrants established themselves in the interior of the state of São Paulo in the vicinity of Santa Bárbara and Americana. They contributed significantly to local agricultural technology and were instrumental in the establishment of several Protestant denominations and associated schools. Some traits of the ancestral Anglo-American culture have been tenaciously maintained.

Other targets of historical geography studies have been cattle producers in the Pantanal of Mato Grosso (WILCOX 1992; 1999) and the cattle ranching system of Rio Grande do Sul (BELL 1998). An earlier study looked at Henry Ford's short-lived venture in the Amazon (GALEY 1979), and Barham and Coomes (1994) reexamined the Amazon rubber boom. Brannstrom's (1997) description of the advantages and pitfalls of using public records will be valuable to geographers investigating land ownership in Brazil. Also interested in land ownership patterns, Muller (1994) concluded that the long-lot shape of holdings in western Paraná was a deterrent to effective mechanization of agriculture.

Some geographers have focused on political topics and events. Caviedes (1984) analyzed the history of authoritarianism and the effect of immigration in Brazil and other nations of the Southern Cone. Hilgard Sternberg (1987) showed that the Brazilian government's actions in the Amazon region have been heavily influenced by political interests, and Foresta (1991) contrasted the Amazon policies and motives of the post-1988 civilian government with those of the previous military regimes.

Migration, social and urban geography.

Migration is fundamentally a spatial process, and internal human relocations in Brazil have been studied by many geographers (DAWSEY 1992). The hope of land, gold, or commercial opportunity has attracted many migrants to frontier areas. The push and pull conditions leading to the rapid increase in settlement in southwest Paraná (DAWSEY 1979a; 1981; 1983) and subsequent out-migration (MULLER 1988a) have been examined. Momsen (1992) looked at similar migration motivators in the gold mining areas of Pará. In addition to the impact on Indigenous populations and the environment (discussed below), the movement to northern frontier areas has had a significant social effect. The unbalanced gender distribution in areas of rapid growth has affected roles and work opportunities (ROBERTS; DODOO 1995), and the migrants to Roraima were found to suffer from a lack of infrastructure and important government services (FURLEY 1994; DINIZ 1997).

Other social conditions have been considered. The ubiquitous Globo television network has arrived in the Amazon (ROBERTS 1995) where it competes with pirate dish receivers. Godfrey (1993) determined that the representation of Amazonia in feature films is somewhat unrealistic but does offer a distinctive regional description

of the area. Voeks (1990; 1997) has looked at plants used in *Candomblé* religious ceremonies. The important *Movimento dos Sem Terra* (landless movement) has been the target of study in Brazil (FERNANDES 1996; MEDEIROS 1999), but it has been absent from Anglo-American geographical literature with the exception of comments by Wolford (1996) and Muller and others (1995; 1999).

Migrants have been attracted to cities as well as frontier areas. The influx has helped to create problems in many urban areas where public resources are already stretched to breaking points, and increased crime rates have been one of the results (DAWSEY 1986). The rapid growth of population within cities has placed pressure on the real estate markets, and policies designed to create affordable housing in Brazil (Rio de Janeiro) cannot rely on standard formulas developed elsewhere. Officials must take into account a variety of local demographic and spatial variables (ARYEETEEY-ATTOH 1989). Urban growth in Brazil during the colonial period was less structured than in Spanish America (GODFREY 1991), and the continued growth of mega-centers such as São Paulo has followed a different course from that of other important cities of the world (WIRTH; JONES 1978). Despite growing use of the automobile in the 1970s, Brazilian cities were slow to take on residential land use patterns typical of many Western centers (DAWSEY 1979b; 1980) as many individuals from the high-income groups continued to reside near the city center while the poor and unemployed remained at the periphery. More recent studies, especially focused on the largest cities, have indicated decentralization of services and an outward movement of the upper classes (GODFREY 1991). Several scholars have proposed land use models for the typical Latin American city (GRIFFIN; FORD 1980; CROWLEY 1998; FORD 1999), but Godfrey (1999b) has claimed that the models are not very useful for understanding the development of such cities as Rio de Janeiro and São Paulo. Godfrey argues that Luso-Brazilian cities have followed somewhat different patterns of development relative to those of Spanish-America, both in colonial and modern periods. He claims that Brazil's distinctive physical, cultural, and historical conditions have often been overlooked in discussions of "Latin American city structure." Though not widely discussed in the geographical literature, the unique and enlightened municipal policies implemented in Curitiba have attracted the attention of planners in the United States (RABINOVITCH and LEITMAN 1996).

The rapid growth of cities on the Brazilian frontier has also been the target of study. Boom towns that are dependent on volatile patterns of resource extraction have emerged in the Amazon region (GODFREY 1990; 1992), and Browder and Godfrey(1990) have proposed a theory of disarticulated urban development to account for differences between these and other types of communities such as the villages that appear overnight along major highways (GODFREY; BROWDER 1996; 1997). City growth and persistence do not appear to conform to a single model but may fit any of several different patterns.

Transportation and economic geography.

Studies in transportation and economic geography have been relatively sparse compared to output earlier in the 20th century. Textbooks by European scholars Peter Odell and David Preston (PRESTON 1996) have contributed to our understanding of the economic geography of Latin America, but studies on Brazil have not been as frequent as for other sub-fields. Though first released in Brazil, Momsen's (1963) classic study on routes over the Serra do Mar gained circulation in the United States, and it has been followed by a description of the Trans-Amazonian highway (WOZNIOWICZ 1974) and criticism of the road building and colonizations programs in the Amazon (SMITH 1976; 1982; MORAN 1989). Anglo-American geographers appear

to have shown little interest in non-highway modes of transportation as well as in studies of the booming Southeast.

While geographers have conducted studies of economic activities in the primary sector, such as agriculture, mining, and forestry; relatively few have focused on manufacturing or services. Auty (1995) described the problems Brazil faces because of its attempts to develop a self sufficient economy in contrast to the export-oriented development of East Asian nations. Meanwhile, Ohuallacháin and Wasserman (1999) studied the effect of liberalized economic policies on the Brazilian automobile industry and discovered that reducing sales taxes and tariffs on imported parts and vehicles caused small-scale independent parts suppliers to become vertically consolidated within the first-tier major manufacturing firms. Though it might also be considered a report on a primary economic activity, Rolf Sternberg's (1985) examination of hydro-electric energy generation pertains directly to industrial development in Southeast Brazil. Socio-economic data were used by Haller (1982) to identify homogeneous regions which ranged from the highly developed São Paulo area to the least developed in the interior Northeast.

Environmental and agricultural geography.

Physical geography is a strong sub-field among Brazilian geographers, but few North America-based scholars have shown interest. Brannstrom and Oliveira (in press) have shown that under-representation of the post-settlement sedimentation (PSA) caused by cotton and coffee production in the interior of the Southeast can have serious environmental management implications. Most studies of the physical environment have been tied to an examination of the human response to difficulties imposed by the climate, soil or terrain; and many of these have addressed agricultural practices. Muller (1986;1988a; 1988b; 1994) has looked at land ownership including the changes brought about by property consolidation and mechanization in western Paraná, and Brannstrom (in press_b) has proposed that the relationship between laborers and land owners on coffee *fazendas* was an important variable affecting the rate of forest clearing in interior São Paulo.

From the days of Preston James (1948; 1952), drought in the Northeast has stimulated investigations. Some have looked at the region as a whole (BROOKS 1971; 1973; WEBB 1974; MARKHAM 1975), while others have studied particular crop alternatives or agricultural management practices (JOHNSON 1979; VOEKS; VINHA 1988; BICALHO; HOFFLE 1989). Government investments in irrigation projects have not altered traditional peasant farming practices (CAVIEDES; MULLER 1995), but the organization of a cooperative was shown to have created benefits (MULLER 1993).

No region of Brazil has received more attention from the Anglo-American geography community than the Amazon. Scholars in the United States have shown great concern over recent changes that have placed the fragile environment under stress (HECHT 1985; BROWDER 1988; HECHT; COCKBURN 1989; ANDERSON 1990; BENDIX 1991). Hilgard Sternberg (1964; 1995a), William Denevan (1973), Nigel Smith (1981; 1995; 1996), Smith and Schultes (1990), and Phillip Fearnside (1986; 1989;1997a; 1997b; 2000) have carefully described the physical geography, vegetation, soil, hydrology, and the indigenous populations; and they also have detailed the processes by which the resources and native cultures have been placed in jeopardy. Whereas low population densities and traditional farming practices permitted sustainable use of the resources in the past, the rapid human influx and the forest destruction that was accelerated by government efforts to promote development have brought the region to the point of environmental and economic collapse. Though the pace may

have slowed (WESCHE and SMALL 1992; R. STERNBERG 1995), the destruction of the environmental systems continues.

One area of great particular interest to geographers has been the examination of evidence of past agricultural practices among indigenous groups. There is much uncertainty about the ultimate carrying capacity of the lands of the Amazon region and about how many people lived in the area at the time of first contacts with Europeans (DENEVAN 1976; 1992). Past as well as current farming practices have been studied (ANDERSON; JARDIM 1989). The discovery of fertile "dark earths" (*terra preta*) within the ubiquitously sterile soils of the tropical forest has intrigued researchers in recent years. Nigel Smith (1980) proposed that the soils were anthropogenic; a result of human intervention (WOODS 1995). Denevan (1996; 1998) developed a model of prehistoric agriculture that included agricultural land use on bluffs (including the *terra preta*) combined with the farming of areas in the *varzeas* of the flood plain. These studies and others (DENEVAN and HIRAOKA 1990), indicated that an earlier alternative agricultural technology may have allowed the region to support a greater number of people than is possible using more recent subsistent practices.

There is not uniform agreement among scholars, however, regarding these matters. McCann et al. (in press), Woods and McCann (1999), and Woods et al. (2000) have recently argued that, while the "dark earths" are probably anthropogenic, physical evidence indicates that many areas of their occurrence were not associated with habitation. Their presence reflects soil management practices in areas under cultivation. These studies carry important implications for officials and technicians interested in establishing a more sustainable pattern of agricultural land use in the Amazon area.

Areas that have been partially ignored by Anglo-American geographers studying Brazil.

Anglo-American geographers appear to be neglecting some important sub-disciplinary areas. Contemporary economic geography is one. Some characteristics of the study of the Brazilian automobile industry by Ohuallacháin and Wasserman (1999) illustrate the lack, rather than the presence, of Brazil-focused professional literature in economic geography. Dr. Breandan Ohuallacháin is a well-respected professor of geography at Arizona State University, but among the 37 entries on his Web site listing of publications, only the one reviewed here deals with Brazil (no web site for Wasserman was discovered). The reference list in the article itself contained 77 entries, many derived from Brazilian sources. However, only 4 came from professional geographical publications, and none of those mentioned Brazil in the title. The point is not to criticize the study or authors but to indicate that 1) the work was done by a geographer whose primary interest focus is not Brazil, and 2) there was very little scholarly literature on the economic geography of Brazil from which to draw information.

Though important at one time, economic geography seems to have taken a back seat in recent decades. This may be due to changes within the subfield itself. During the period under consideration (1945-2000) the focus in economic geography has changed from the pure description of commodities and industries to an analysis of highly quantified theoretical landscapes to the modeling of the interaction between global core and periphery realms. Traditions in geography with strong regional foci to which someone interested in Brazil might be drawn may have lost some contact with the more recent directions within economic geography. Studies in economic geography are often heavily dependent on large quantities of good data, and the access to and comprehension of sources present in Brazil may be more difficult for many Anglo-Americans. Most geographical studies of Brazil by Anglo-Americans have relied on basic knowledge of the country and local conditions derived from careful field

observations. Relatively few have sought to extract information by analyzing complex collections of data.

Brazilian geographers may have moved in to fill the vacuum, but the potential topics for Anglo-American geographers are numerous. Brazil's industrial economy is booming and diverse. The country exports manufactured items to destinations around the world, and most are produced in the congested Southeast. Incentives encouraging factories to move out of the city of São Paulo have been in place for several years, but the strong agglomeration forces have been slow to yield. The country is moving toward a service economy similar to, but in many ways different from, that of the United States. Developments such as privatization, more women in the work force, the automobile, and computers are creating fundamental shifts in Brazilian society. Many of these changes include spatial aspects well suited for geographical study.

Similarly, relatively few transportation studies have been performed. Overland routes in the Amazon region have been examined, but these have often been cast as elements related to the more important variables of migration, settlement, and forest destruction. Interaction and gravity potential models, so widely used by transportation geographers in the United States, have not found their way into studies of Brazil. The nation possesses a well developed highway network, a problem-laden rail system, and a booming commercial air business. Large metropolitan areas are supplied by streams of trucks. Intra-urban congestion is legendary, and accident rates are high. The potential consequences of the recently announced *Avança Brasil* program warrant further study. Proposed improvement in navigation on the Paraguay river upstream of Corumbá in the Pantanal region has generated environmental opposition, and completion of the Paraná-Tietê *hidrovia* to the port of Artemis in interior São Paulo has been touted as an economic boon. The ultimate impact of these and similar programs is by no means certain. Engineers, economists, and developers sometimes are not as well equipped to investigate these types of developments within the broader social and environmental contexts so familiar to geographers.

Agriculture has attracted the attention of Anglo-American researchers, but most studies have dealt with small-scale peasant production systems. Studies in the Southeast by Dawsey (1979a; 1981; 1983) and Muller (1988a; 1988b; 1994) have focused on the developing frontier in western Paraná, near the Mato Grosso and Paraguay borders. Still lacking is research on the more established agricultural areas of northern Paraná, interior São Paulo and Minas Gerais. Interesting changes, such as the replacement of coffee by citrus over large areas, the return of coffee to Minas Gerais, or the expansion of sugar cane acreage in response to the demands created by alcohol and gasohol-burning automobile engines are potential topics for investigation.

Political and social geography are also under-represented in the Anglo-American literature. During the second half of the 20th century the nation experienced over two decades of military domination followed by an eventful return to democratic rule. Recent years have included the death of a president-elect prior to his assumption of office, the writing of a new constitution, numerous political scandals, and the impeachment of a sitting president. These national events as well as the shifting political landscapes at the state and local levels warrant geographical study. Similarly, dramatic social changes are taking place. Greater physical and economic mobility, the ever-increasing intrusion of mass media, the battle between Brazil-original music and film styles against foreign invasion, changing life-styles in the cities, and other social topics might be studied.

Finally, few Anglo-American geographers seem to be using the powerful analytical tools of GIS and remote sensing analysis in their studies of Brazil. These tools are applied in Brazil by local geographers (PIRES; NOVO 1991) and by technical experts from abroad. It is possible that Anglo-American geographers are also involved but

that they are not publishing in the traditional geographical literature. The primary outlets may be journals in other fields such as agronomy, forestry, or ecology (BRONDIZIO; MORAN 1994; MORAN et al. 1994; BRONDIZIO et al. 1994; BAVIA et al. 1999; MCCracken et al. 1999; NELSON et al. 2000). The new technologies are being applied in Brazil by national government centers and agencies (CEAPLA 2000; INPE 2000) and under contract with foreign entities (SHIFT 2000).

The apparent absence of Anglo-American geographers using GIS and other contemporary tools in the analysis of Brazilian topics may be due to any number of factors. It may pertain to the association of Brazilian geography, as taught and studied in the United States, with the tradition of regionalism. A second factor may relate to limited access in the past to sources of data. Possibly, geographers are working with new technology but releasing results through private reports or outlets outside the traditional geographical journals. Finally, research on Brazil is highly personal, and scholars pursue their own interests. These interests may not include the application of GIS or similar techniques.

FUTURE DIRECTIONS, NEEDS, AND POSSIBLE AREAS OF COLLABORATION BETWEEN ANGLO-AMERICAN AND BRAZILIAN SCHOLARS

It is difficult to predict future directions in the study of Brazil by Anglo-American geographers. Among the community of Latin Americanist geographers, the percentage who specialize in Brazil is small compared to the number concentrating on other areas. Only a handful of articles have been published about Brazil in the major geographical journals in recent years. In 1985 (the most recent available data), 36 of the 286 (12.5 %) Latin Americanist geographers listed in the *National Directory of Latin Americanists* (LIBRARY OF CONGRESS 1985) indicated Brazil as their first regional area of interest.

The scholars within this limited group have usually selected a subject focus based on: 1) the personal interests, experiences, and training of the researcher; 2) the relevance of the topic as perceived in the United States or Canada; and 3) access to the information necessary to conduct the study. Recent research has certainly reflected personal interest and training. Graduate students are attracted to faculty with compatible interests; and teachers in turn infect their students with their own passions. Consequently, succeeding generations of scholars often continue in the same lines of study.

There is little doubt that the Amazon region has attracted an inordinate percentage of United States interest both within and without academia. Long neglected, this area is now the focus of much global concern, and that has been reflected in the amount of geographical scholarship. Several among the current generation have taken up the baton, so there is little indication that this emphasis will change in the near future.

David Robinson's (1989) comments on the unbalanced character of Latin Americanist research in "Geographers in Latin America" apply to Brazilianist scholarship. He stated that there is predominance of historical-oriented Latin American geographers and their advisees in the U.S. who perpetuate this leaning. Thus, pre-Hispanic agriculture receives more attention than does current agrarian-reform issues. This results perhaps because U.S. geographers are reluctant to study politically sensitive issues, thus safer historical related topics are preferred. Not to belittle the importance of historical geography, but North American geographers could provide a more balanced coverage

of Brazil if they were to conduct more research on contemporary issues including those that are politically sensitive.

Robinson also points out that his fellow geographers may feel more comfortable in topical rather than regional specialties where the demand for jobs lie. Risking time, personal funds, and energy in travel and language training to follow a career in Brazilian studies is not attractive when safer havens of typical specialties exist. Although "born-again" regionalists exist today, they are small in number. Robinson also comments that North American geographers seem to have abandoned the field of urban analysis to urban anthropologists and sociologists and that agricultural studies are lacking in the literature. As mentioned above, one geographer, Muller (1986, 1988a, 1988b 1994), has examined the impact of agricultural modernization on land issues, settlement systems, and rural migration in South Brazil.

Most data used by geographers have been derived from painstaking personal collecting in the field. New options are becoming available. Brazilian census data (IBGE 2000), and GIS spatial data (GEOCOMMUNITY 2000) are now available on the Internet. Electronic mail facilitates the communication with fellow scholars as well as informants in Brazil, and these changes should facilitate geographical research in some heretofore neglected areas.

Finally, there is little contact between Northern Hemisphere scholars and potential Brazilian colleagues. Very few Anglo-Americans have published in Portuguese language journals. This may be due to limited contact with Brazilian outlets, less facility with the language (though several Brazilian journals accept manuscripts in English) or a perception that a publication in Brazil is less significant (especially in the eyes of members of tenure and promotion committees) than output in an Anglo-American journal. It would be useful to attempt to develop mechanisms that will lead to a greater interaction between Brazilian geographers and their Anglo-American colleagues. In an era of tight travel budgets, attendance at common meetings is not always easy. The CLAGNET e-mail network serves as an effective means of communication among Latin Americanists, and an off-shoot might be developed in order to serve the community of Brazilianists. Similar networks exist among Brazilian geographers, so cross-listings of resumes and e-mail addresses might be accomplished.

The disciplines of geography in Anglo-America and in Brazil come from different traditions, and interaction would allow each group to broaden its perspective on the field. Additional benefits might include sharing of data, collaboration, avoidance of duplication, and an overall better understanding of the diversity of human and physical landscapes in Brazil. As more and more scholars take advantage of the opportunities afforded by modern communications technology, the separation between the disciplines in the Northern and Southern hemispheres should become narrower. The study of Brazil has a rich tradition among Anglo-American geographers, and we should make every effort to ensure continued interest.

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