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## INTRODUCCION

En 1976 México fue sede del 38 Congreso Mundial de la Federación Internacional de Documentación (FID). Este congreso tuvo como tema central "La Información y el Desarrollo".

Para entonces, el CICH tenía cinco años de creado y tres de compilar los datos para su "Bibliografía Latinoamericana". El material acumulado en 1974-1975 se prestaba para el estudio preliminar de algunos aspectos importantes de la investigación en nuestra región.

El personal del CICH inició ese estudio, lo que dio como resultado una serie de trabajos que fueron propuestos al Comité Organizador del Congreso; al aceptarlos, uno de los miembros del Comité de Selección opinó: "Estoy muy impresionado por la calidad e importancia del trabajo presentado en estos artículos".

Sin embargo, estos artículos, al no haber sido impresos y puestos en circulación por los organizadores del Congreso, no contaron con la difusión adecuada y oportuna. Aún así, las solicitudes de copias de los mismos no han sido infrecuentes, y el Dr. F. W. Lancaster de la Graduate School of Library Science de la Universidad de Illinois, los ha citado más de una vez.\*

En una de estas citas (1979), Lancaster dice: "Apart from the impressive compilation of data for the

## FOREWORD

In 1976 the 38 World Congress of the International Federation of Documentation (FID) was held in Mexico City. The Congress centralized its interest on the slogan "Information and Development".

By then, CICH had turned its 5th year of activities and had, during the last three, compiled the data for its "Bibliografía Latinoamericana". The material accumulated in 1974-1975 was ideal for a preliminary study of some important aspects of research in our region.

CICH's staff initiated this study, resulting in a series of papers that where proposed to the Congress Organizing Committee and, being accepted, one member of the Selection Committee expressed the following opinion: "I am very impressed by the quality and importance of the work represented in these papers."

However, the papers were not printed and circulated by the Congress organizers and, consequently, did not receive the proper and timely dissemination. Nevertheless, request for copies of the same papers have been frequent, and Dr. F. W. Lancaster of the Graduate School of Library Science, University of Illinois, has cited them more than once.\*

In one of these citations (1979) Lancaster writes: "Apart from the impressive compilation of data for

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United States by King et al. (1976), some of the most relevant studies toward the development of statistical indicators of the type outlined have been conducted in México at the Centro de Información Científica y Humanística, Universidad Nacional Autónoma de México. This work is summarized in four papers by Sandoval et al., Buttenklepper et al. and Pérez-Guinjoan et al. The bibliometric studies conducted in México examine the quantity and distribution of articles on Latin America published in non-Latin American journals, including the proportion of the total contributed by Latin American authors, and the extent to which scientific and humanistic research conducted in Latin America is reported in journals of world prestige published outside Latin America. The contribution of individual countries to this literature, the contribution of individual institutions in these countries, and the distribution of the literature over about 4000 journals is also examined. The studies conducted in México can be regarded as useful models of what can be done in the development of indicators of communication, in science, technology, and other fields, that may be of direct concern to policy makers at national levels."

Al contar con un nuevo órgano de circulación, el CICH ha creído

the United States by King et al., some of the most relevant studies toward the development of statistical indicators of the type outlined have been conducted in Mexico at the Centro de Información Científica y Humanística, Universidad Nacional Autónoma de México. This work is summarized on four papers by Sandoval et al., Buttenklepper et al. and Pérez-Guinjoan et al. The bibliometric studies conducted in Mexico examine the quantity and distribution of articles on Latin America published in non Latin American journals, including the proportion of the total contributed by Latin American authors, and the extent to which scientific and humanistic research conducted in Latin America is reported in journals of world prestige published outside Latin America. The contribution of individual countries to this literature, the contribution of individual institutions in these countries, and the distribution of the literature over about 4000 journals is also examined. The studies conducted in Mexico can be regarded as useful models of what can be done in the development of indicators of communication, in science, technology, and other fields, that may be of direct concern to policy makers at national levels."

Now that CICH has this new tool of circulation, it was considered convenient to give these papers the long delayed and needed

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conveniente darles la difusión que merecen. Por eso se presentan ahora como Número 3 de INFORUM. Se conservan en inglés, por haber sido la lengua oficial del Congreso.

dissemination. This is the reason to publish them as Number 3 of INFORUM. They are written in English, the official language of the Congress.

\* Lancaster, F.W. "Toward paperless Information Systems", Academic Press, 1978 (Chapter 5, Some problems of formal communication in Science and Technology").

\* Lancaster, F.W. "Information retrieval systems: characteristics, testing and evaluation". 2nd. ed. John Wiley & Sons, 1979 (Chapter 17, Evaluation of a National Information System).

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## THE VEHICLES OF THE RESULTS OF LATIN AMERICAN RESEARCH. A BIBLIOMETRIC APPROACH.

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### BACKGROUND

As recent as 1970 Latin American specialist gathered "to formulate recommendations permitting the definition of a policy to facilitate scientific communication, to disseminate the results of the research, and to gain a better acknowledgement both in Latin America and the rest of the world, of the scientific and technological progress of the continent" (1).

The specialists knew that the results of high level Latin American research have always been as easily disseminated as those from any other region of the world. The problem, of which all were conscious, was that the written communication did not use its natural vehicles: the Latin American journals. The magnitude of the problem was

ignored, and the likely reason for not tackling it earlier was the suspected fact of its great dispersion.

The first relevant data was reported in 1974 on the field of Biomedicine (2), followed in 1975 by a report on Chemistry (3). Both works showed the big volume and the great dispersion of Latin American manuscripts in foreign journals.

Ever since its creation in 1971, the Centro de Información Científica y Humanística (CICH) of the Universidad Nacional Autónoma de México (UNAM) has been tackling this problem and preparing two current compilations: "Bibliografía Mexicana" and "Bibliografía Latinoamericana". Several bibliometric analysis have been made using this unique material, this report being one of

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them (4, 5, 6).

It is based on the idea, which claims to support, that the largest part of the results of high level research carried out in Latin America is channeled to foreign vehicles, depending to a large degree on the subject investigated. For example, elsewhere it is pointed out that sociologists and humanists in general have a tendency to use their own local or regional journals (7). At the other end of the scale, a large volume of biomedical manuscripts are exported to foreign journals. This report is concerned with those foreign journals in which Latin American manuscripts are published.

The data used were compiled from **Current Contents** during the two-year period covering from August 1973 to July 1975 inclusive, and listed as the two sections mentioned above. The total number of articles was 4,656.

## RESULTS

Once more it becomes evident that the publishing habits of Latin American researchers show a great dispersion:

1. The 4,656 articles were published in 1,162 foreign journals, with an average of 4 articles per journal.
2. Fifteen journals (1.3% of the

total) published more than 25 articles each, amounting to 551 articles (11.8% of the total), with an average of 36.7 articles per journal.

3. Thirty journals (2.6% of the total), published between 15 and 24 articles each, amounting to 567 articles (12.2% of the total), with an average of 18.9 articles per journal.
4. Sixty-three journals (5.4% of the total), published between 10 and 14 articles each, amounting to 711 articles (15.3% of the total), with an average of 11.3 articles per journal.
5. The three previous items show that 108 journals (9.3% of the total), published more than 10 articles each, amounting to 1,829 articles (39.3% of the total), with an average of 16.9 articles per journal.

The first conclusion is that here are a little more than one hundred non-Latin American journals with which Latin American researchers have established close and permanent links, which are particularly receptive to results of Latin American research, and which should be considered as the core journals as far as one of the most important Latin American bibliographic activities is



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concerned.

The important fact is that all these journals cover the fields of pure and applied sciences, and non is concerned with sociology and/or the humanities.

There is still a smaller number of 15 hard core journals to which

(UNAM subscribes) which publish an annual average of 16-19 articles each, of articles produced in Latin America and which, because of their unusual importance, are listed bellow in decreasing number of articles published during the two-year period:

Journal	No. of articles
1. Biochimica et Biophysica Acta	66
2. Experientia	63
3. Phytochemistry	55
4. Solid State Communications	43
5. Biochemical and Biophysical Research Communications	38
6. FEBS Letters	32
7. Astrophysical Journal	31
8. Journal of Inorganic and Nuclear Chemistry	30
9. Lettere al Nuovo Cimento	30
10. Journal of Chemical Physics	29
11. Brain Research	28
12. Journal of Mathematical Physics	28
13. Physical Review-Series D	28
14. Physical Review-Series B	25
15. Transactions of the Royal Society of Tropical Medicine and Hygiene	25

The above list gives a rough idea of the main interests and trends of Latin American research.

When the ranks of the 10 most important journals in the multidisciplinary study (4) are

compared with the ranks of journals in the previous Biomedicine (2) and Chemistry (3) studies, some interesting results and coincidences are found.

TABLE I

Journal	Rank of importance and percentage of articles related to the respective total.		
	Multi-disciplinary	Biomedicine	Chemistry
Biochimica et Biophysica Acta	1 (1.42%)	1 (3.13%)	1 (5.0%)
Experientia	2 (1.35%)	2 (2.89%)	6 (1.7%)
Phytochemistry	3 (1.18%)	— — —	2 (3.9%)
Solid State Communications	4 (0.92%)	— — —	— — —
Biochemical and Biophysical Research Communications	5 (0.82%)	— — —	3 (2.7%)
FEBS Letters	6 (0.69%)	— — —	5 (2.0%)
Astrophysical Journal	7 (0.67%)	— — —	— — —
Journal of Inorganic and Nuclear Chemistry	8 (0.64%)	— — —	7 (1.7%)
Lettere al Nuovo Cimento	9 (0.64%)	— — —	— — —
Journal of Chemical Physics	10 (0.62%)	16 (0.45%)	8 (1.4%)

The discrepancies of the above data are more remarkable when it is thought that in the multidisciplinary study Biomedicine was the field better covered. The explanation may be that the many times mentioned dispersion is more marked for biomedical articles in contrast with physical and chemical articles which are more concentrated in less number of journals.

A striking finding is the first rank of *Biochimica et Biophysica Acta* in the three studies. This most important vehicle of Latin American research started in 1947 with an annual publication of less than half a million words; in 1965 the number had reached seven and a half

million words per year (8); this increase had been virtually logarithmic with a doubling time of 4.6 years. The biochemical literature, including the corresponding production from Latin America, is expanding in a logarithmic fashion with doubling times of about 5-7 years; the contributions are not only more numerous but becoming longer as well. It is unquestionable that *Biochimica et Biophysica Acta* is a "must" in any Latin American collection, specially in scientific (University libraries).

Another relevant data are the following:

**TABLE II**

The Five most Productive Latin American Countries and the Journals in which they Published more than 10 Articles during the Two-Year Period

**BRAZIL**

Eighteen journals (1.5% of the total) with 285 articles (6.1% of the total).

Phytochemistry	26
Phys Rev - B	23
Solid St Comm	22
Experientia	21
Phys St Sol - B	21
J Inorg Nucl Chem	19
Trans R Soc Trop Med Hyg	19
Agent Action	15
Lettere Nuov Cim	14
Biochim Biophys Acta	13
Acta Anat	12
Bull Amer Math Soc	12
Nucl Phys - A	12
Nuov Cim	12
Phys Lett - A	12
Biochem Biophys Res Comm	11
J Protozool	11
C R Acad Sci - A	10
TOTAL	285

**ARGENTINA**

Eleven journals (0.9% of the total) with 188 articles (4.0% of the total)

Experientia	32
Biochim Biophys Acta	26
FEBS Lett	19
Biochem Biophys Res Comm	17
J. Electroanalyt Chem Interf	
Electrochem	17
Carbohydr Res	16
J Neurochem	14
Electroanalyt Chem	13
J Endocrinol	12
Life Sci	11
Neuroendocrinology	11
TOTAL	188

**MEXICO**

Five journals (0.4% of the total) with 56 articles (1.2% of the total)

Phys Rev - D	13
Phytochemistry	12
Int J Dermatol	11
Fertil Steril	10
J Chem Phys	10
TOTAL	56

**CHILE**

Astr J	19
Astron Astrophys	13
TOTAL	32

**VENEZUELA**

Int J Theor Phys	11
Biochim Biophys Acta	10
TOTAL	21

Brazil's list, besides being the longest, has 50% of Physics and Mathematics journals, which is the more remarkable when compared with the second list in importance: Argentina's, where all eleven journals cover the fields of

Biomedicine and Biochemistry.

The following table illustrates the number of journals that each country uses for publishing the results of this research. It is observed that Perú shows the major and Brazil the minor dispersion.

TABLE III

Country	Argentina	Brazil	Chile	Colombia	México	Perú	Venezuela
No. of articles	1243	1420	430	102	779	83	324
No. of journals	486	529	233	82	387	69	196
Articl/Jour ratio	2.56	2.68	1.85	1.24	2.01	1.22	1.65

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1. "Informe del Grupo de Expertos convocados por la Secretaría General de la OEA para Estudiar la Promoción de las Revistas Científicas y Técnicas de América Latina". Washington, D.C., OEA Documentos Oficiales (OEA/Ser. J/XI, CIYT/Doc. 30 (español). Add. 3, 4 de marzo 1970, Washington, D.C.
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  4. Pérez-Guinjoán, A., Büttinklepper, A., Sandoval, A.M. and Almada de Ascencio, M. "Research in Latin America. A Bibliometric approach". Paper submitted to the 38 World Congress of FID. México City, Sep 27- Oct 1, 1976.
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  7. Guerra, R., Cimet, E. and Martínez, J.A. "CLASE (Citas Latino Americanas en Sociología y Economía): un sistema de información para el desarrollo". Paper submitted to the 38 World Congress of FID. México City, Sep 27-Oct 1, 1976.
  8. Webb, E.C. "Communication in Biochemistry". *Nature (London)*, 225(5228):132-135, 10 Jan 1970.
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